Beechcraft

Beechcraft®

Musketeer® Sport III

A23-19 and 19A

(Serials MB-1 thru MB-288) (MB-289 thru MB-460)

Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

FAA Approved in Normal and Utility Category based on CAR 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 3.

Airplane Serial Number: MB-32

Airplane Registration Number: SP-FGW

FAA Approved:

A. C. Jackson
Beech Aircraft Corporation
DOA CE-2

This handbook supersedes all BEECH published owner's manuals, flight manuals, and check lists issued for this airplane with the exception of FAA Approved Airplane Flight Manual Supplements.

P/N 169-590002-7
Issued: October, 1979

P/N 169-590002-7A2
Revised: July, 1994

Published By
Commercial Publications
BEECH AIRCRAFT CORPORATION
Wichita, Kansas 67201
U.S.A.

Raytheon Aircraft

Musketeer A23-19, 19A
Log of Temporary Changes
to the
Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual
P/N 169-590002-7

Changes to this Pilot's Operating Handbook and FAA Approved Airplane Flight Manual must be in the airplane for all flight operations.

Part Number	Subject	Date
169-590002-7TC1	Fuel Selector Placard Installation	8/26/97

Note: This page should be filed in the front of the *Pilot's Operating Handbook and FAA Approved Airplane Flight Manual* immediately following the *Title* page. This page replaces any *Log of Temporary Changes* page dated prior to the date in the lower right corner of this page.

MUSKETEER SPORT III
A23-19
(MB-1 THRU MB-288)
AND 19A
(MB-289 THRU MB-460)
PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL

A2 Revision . . . . . .July, 1994

LOG OF REVISIONS

Page	Description
Title Page	Updated
Page A (A2)	New
10-1 thru 10-48	Revised Section X, Safety Information (May, 1994)

A2

MUSKETEER SPORT III
A23-19
(MB-1 THRU MB-288)
AND
19A
(MB-289 THRU MB-460)

PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL

A1 Revision . . . . . October, 1990

LOG OF REVISIONS

Page	Description
Title Page	Updated
Page A (A1)	New
10-1 thru 10-48	Revised Section X, Safety Information (October, 1990)

A1

A23-19, 19A Sport III
Pilot's Operating Handbook
and
FAA Approved
Airplane Flight Manual

LOG OF REVISIONS

Original (A) . . . . . October 1979

PAGE	DESCRIPTION
Title Page	Original
Page A	Original
a and b	Original
1-1 thru 1-18	Original
2-1 thru 2-30	Original
3-1 thru 3-12	Original
4-1 thru 4-14	Original
5-1 thru 5-20	Original
6-1 thru 6-20	Original
7-1 thru 7-28	Original
8-1 thru 8-46	Original
Section 9	See Log of Supplements
10-1 thru 10-30	Original

A

INTRODUCTION

This Pilot's Operating Handbook and FAA Approved Airplane Flight Manual is in the format and contains data recommended in the GAMA (General Aviation Manufacturers Association) Handbook Specification Number 1. Use of this specification by all manufacturers will provide the pilot the same type data in the same place in all of the handbooks.

In recent years BEECHCRAFT handbooks contained most of the data now provided, however, the new handbooks contain more detailed data and some entirely new data.

For example, attention is called to Section X SAFETY INFORMATION. While little of the information is new and every pilot has been exposed to the basic fundamentals, BEECHCRAFT feels 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.

TABLE OF CONTENTS

SECTION 1 ..... General

SECTION 2 ..... Limitations

SECTION 3 ..... Emergency Procedures

SECTION 4 ..... Normal Procedures

SECTION 5 ..... Performance

SECTION 6 ..... Weight and Balance/Equipment List

SECTION 7 ..... Systems Description

SECTION 8 ..... Handling, Servicing and Maintenance

SECTION 9 ..... Supplements

SECTION 10 ..... Safety Information

SECTION I

GENERAL

TABLE OF CONTENTS

SUBJECT	*PAGE*
Thank You	1-3
Important Notice	1-3
Use of the Handbook	1-4
Revising the Handbook	1-5
Supplements Revision Record	1-6
Vendor-Issued STC Supplements	1-6
Airplane Three View	1-7
Ground Turning Clearance	1-8
Descriptive Data	
Engine	1-9
Propeller	1-9
Fuel	1-9
Oil Capacity	1-10
Approved Oil Types	1-10
Maximum Certificated Weights	1-10
Cabin and Entry Dimensions	1-11
Baggage Space	1-11
Specific Loadings	1-11
Symbols, Abbreviations and Terminology	
General Airspeed	1-12
Meteorological	1-14
Power	1-15
Engine Controls and Instruments	1-15
Airplane Performance and Flight Planning	1-16
Weight and Balance	1-16

INTENTIONALLY LEFT BLANK

THANK YOU . . . for displaying confidence in us by selecting a BEECHCRAFT airplane. Our design engineers, assemblers and inspectors have utilized their skills and years of experience to ensure that the BEECHCRAFT meets the high standards of quality and performance for which BEECHCRAFT airplanes have become famous throughout the world.

IMPORTANT NOTICE

This handbook must be read carefully by the owner and 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.

As a further reminder, the owner and operator of this airplane should also be familiar with the Federal Aviation Regulations applicable to the operation and maintenance of the airplane and FAR 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 Federal Aviation 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 the continued

airworthiness of this airplane, in a condition equal to that of its original manufacture.

Authorized BEECHCRAFT Aero or Aviation Centers and International Distributors or Dealers can provide recommended modification, service, and operating procedures issued by both FAA and Beech Aircraft Corporation, which are designed to get maximum utility and safety from this airplane.

USE OF THE HANDBOOK

The Pilot's Operating Handbook is designed so that necessary documents may be maintained for the safe and efficient operation of the airplane. The handbook has been prepared in loose leaf form for ease in maintenance and in a convenient size for storage. The handbook has been arranged with quick reference tabs imprinted with the title of each section and contains ten basic divisions:

Section 1 General

Section 2 Limitations

Section 3 Emergency Procedures

Section 4 Normal Procedures

Section 5 Performance

Section 6 Weight and Balance/Equipment List

Section 7 Systems Description

Section 8 Handling, Servicing and Maintenance

Section 9 Supplements

Section 10 Safety Information

NOTE

Except as noted, all airspeeds quoted in this handbook are Indicated Airspeeds (IAS) and assume zero instrument error.

Due to the large variety of airplane configurations available through optional equipment, it should be noted that in describing and illustrating the handbook, optional equipment may not be designated as such in every case. Through variations provided by custom designing, the illustrations in this handbook will not be typical of every airplane.

Neither Service Publications, Reissues, nor Revisions are automatically provided to the holder of this handbook. For information on how to obtain "Revision Service" applicable to this handbook, consult any BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer or refer to the latest revision of BEECHCRAFT Service Instructions No. 0250-010.

BEECH AIRCRAFT CORPORATION EXPRESSLY RESERVES THE RIGHT TO SUPERSEDE, CANCEL AND/OR DECLARE OBSOLETE ANY PART, PART NUMBERS, KITS OR PUBLICATION THAT MAY BE REFERENCED IN THIS HANDBOOK WITHOUT PRIOR NOTICE.

REVISING THE HANDBOOK

Immediately following the title page is the "Log of Revisions" page(s). The Log of Revisions pages are used for maintaining a listing of all effective pages in the handbook (except the SUPPLEMENTS section), and as a record of revisions to these pages. In the lower right corner of the outlined portion of the Log of Revisions is a box containing

a capital letter which denotes the issue or reissue of the handbook. This letter may be suffixed by a number which indicates the numerical revision. When a revision to any information in the handbook is made, a new Log of Revisions will be issued. All Logs of Revisions must be retained in the handbook to provide a current record of material status until a reissue is made.

WARNING

When this handbook is used for airplane operational purpose it is the pilot's responsibility to maintain it in current status.

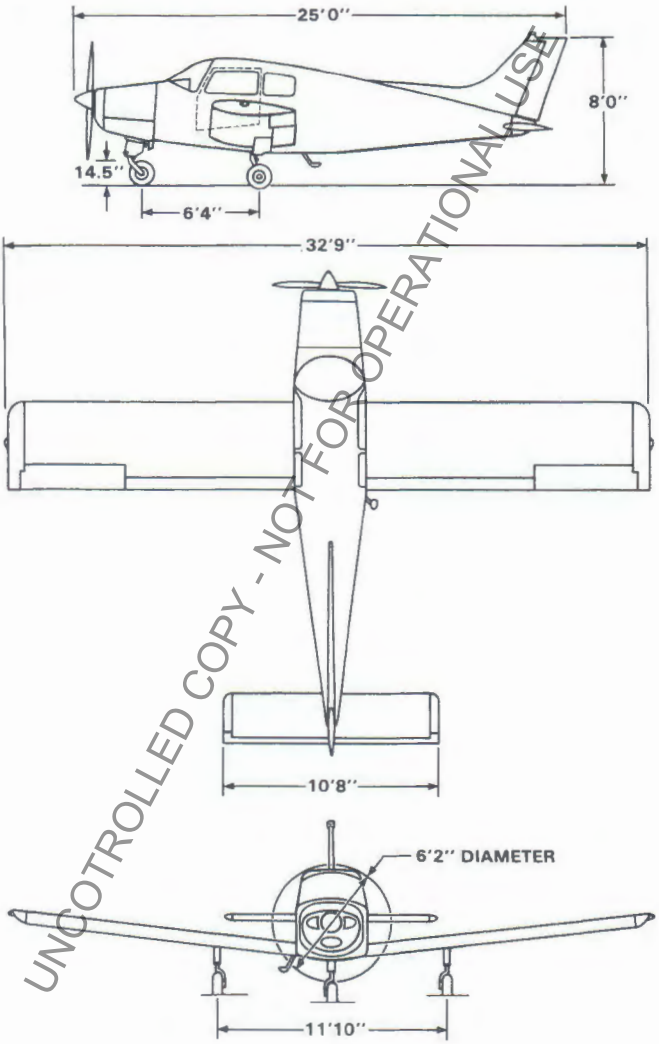
SUPPLEMENTS REVISION RECORD

Section IX contains supplements and a Log of Supplements page. On the "Log" page is a listing of the supplemental equipment available for installation on the BEECHCRAFT airplane.

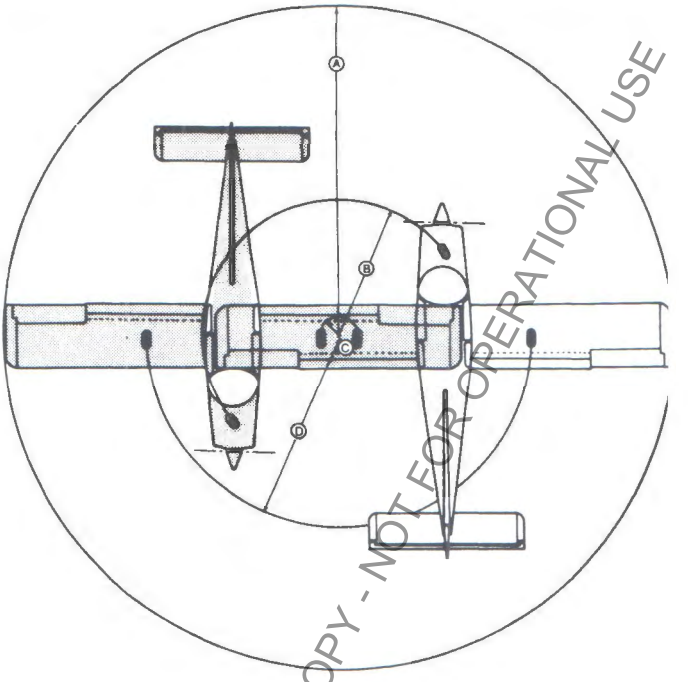
Upon receipt of a new or revised supplement, compare the "Log" page just received with the existing "Log" page in the manual. Retain the "Log" page with the latest date on the bottom of the page (this log will usually have the greater number of entries) and discard the other log.

VENDOR-ISSUED STC 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 Beech 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 THREE-VIEW



GROUND TURNING CLEARANCE

Ⓐ Radius for Wing Tip ..... 23 ft. 11 in.
Ⓑ Radius for Nose Wheel ..... 9 ft. 10 in.
Ⓒ Radius for Inside Gear ..... 2 ft. 0 in.
Ⓓ Radius for Outside Gear ..... 13 ft. 0 in.

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

DESCRIPTIVE DATA

ENGINE

Airplane is equipped with an Avco Lycoming O-320-E2B, O-320-E2C or O-320-E3D engine rated at 150 horsepower.

Take-off and maximum continuous operation (sea level): 2700 rpm, full throttle.

Engine cooling has been demonstrated for a 100° F day.

PROPELLER

Sensenich M74DM-O-58 or 74DM6-O-58 fixed-pitch, two-blade propeller. Static rpm at maximum permissible throttle settings: Not over 2400 rpm and not under 2300 rpm. No additional tolerance permitted. Diameter 74 inches, no cutoff permitted.

FUEL

Aviation Gasoline 80/87 (red) minimum grade or 100LL (blue) or 100 (green).

*59.8-gallon system
(29.9 gallons each tank) ..... *58.8 gallons usable

Each tank has provisions for partial filling to:

20 gallons each tank ..... 38.8 gallons usable
15 gallons each tank ..... 28.8 gallons usable

After compliance with BEECHCRAFT S.I. No. 0624-281:

*59.8-gallon system
(29.9 gallons each tank) ..... *52.2 gallons usable

Each tank has provisions for partial filling to:

20 gallons each tank ..... 32.2 gallons usable
15 gallons each tank ..... 22.2 gallons usable

*Value given is nominal. Tank capacity will vary with temperature and manufacturing tolerances.

OIL CAPACITY

The oil capacity is 8 quarts.

APPROVED OIL TYPES

Avco Lycoming Specification Number 301E approves for use lubricating oils which conform to both MIL-L-6082B straight mineral type and MIL-L-22851 ashless dispersant lubricants for airplane engines. Refer to the Approved Engine Oils table in the HANDLING, SERVICING AND MAINTENANCE section for a list of approved products.

MAXIMUM CERTIFICATED WEIGHTS

NORMAL CATEGORY (A23-19)

Maximum Ramp Weight ..... 2205 lbs
Maximum Take-Off Weight ..... 2200 lbs
Maximum Landing Weight ..... 2200 lbs

NORMAL CATEGORY (19A) (A23-19 when kit 23-5003 is installed)

Maximum Ramp Weight ..... 2255 lbs
Maximum Take-Off Weight ..... 2250 lbs
Maximum Landing Weight ..... 2250 lbs

UTILITY CATEGORY (A23-19)
UTILITY / ACROBATIC CATEGORY (19A)

Maximum Ramp Weight	2035 lbs
Maximum Take-Off Weight	2030 lbs
Maximum Landing Weight	2030 lbs

ALL CONFIGURATIONS

Maximum Zero Fuel Weight	No Structural Limit
Maximum Weight in Baggage Compartment	340 lbs.

CABIN AND ENTRY DIMENSIONS

Length (maximum)	7 ft 11 in.
Height (maximum)	4 ft 0 in.
Width (maximum)	3 ft 5 in.
Cabin Door	36 in. wide by 38 in. high

BAGGAGE SPACE

Compartment Volume	28.5 cu ft

SPECIFIC LOADINGS (2200 lbs.)

Wing Loading	15.07 lbs/sq ft
Power Loading	14.67 lbs/hp

SPECIFIC LOADINGS (2250 lbs.)

Wing Loading	15.41 lbs/sq ft
Power Loading	15.00 lbs/hp

SYMBOLS, ABBREVIATIONS AND TERMINOLOGY

The following Abbreviations and Terminologies have been listed for convenience and ready interpretation where used within this handbook. Whenever possible, they have been categorized for ready reference.

GENERAL AIRSPEED TERMINOLOGY

CAS Calibrated Airspeed is the indicated speed 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_{NE}	Never Exceed Speed is the speed limit that may not be exceeded at any time.
V_{NO} or V_C	Maximum Structural Cruising Speed is the speed 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.
Cruise Climb	Recommended Climb Speed for enroute climb.

METEOROLOGICAL TERMINOLOGY

ISA	International Standard Atmosphere in which (1) The air is a dry perfect gas; (2) The temperature at sea level is 15° Celsius (59° Fahrenheit); (3) The pressure at sea level is 29.92 in Hg. (1013.2 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 inflight temperature indications adjusted for instrument error and compressibility effects, or ground meteorological sources.
Indicated Pressure Altitude	The number actually read from an altimeter when the barometric subscale has been set to 29.92 in Hg. (1013.2 millibars).
Pressure Altitude	Altitude measured from standard sea-level pressure (29.92 in. Hg) by a pressure or barometric altimeter. It is the indicated pressure altitude corrected for position and instrument error. In this Handbook, altimeter instrument errors are assumed to be zero. Position errors may be obtained from the Altimeter Correction Graph.

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

Take off and Maximum Continuous	Highest power rating not limited by time.

ENGINE CONTROLS AND INSTRUMENTS

Throttle Control	Used to control power by introducing fuel-air mixture into the intake passages of the engine.
Mixture Control	This control is used to set fuel flow in all modes of operation and cuts off fuel completely for engine shut down.
EGT (Exhaust Gas Temperature Indicator)	This indicator is used to identify the lean and best power fuel flow for various power settings.
Tachometer	Indicates the rpm of the engine/propeller.

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 demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the airplane during take-off and landing was actually demonstrated during certification tests.
MEA	Minimum enroute IFR altitude.
Route Segment	A part of a route. Each end of that part is identified by: (1) a geographical location; or (2) a point at which a definite radio fix can be established.
GPH	U.S. Gallons per hour.
PPH	Pounds per hour.

WEIGHT AND BALANCE TERMINOLOGY

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.

Arm	The horizontal distance from the reference datum to the center of gravity (C.G.) of an item.
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.)
Airplane Center of Gravity (C.G.)	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.
C.G. Arm	The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight.
C.G. Limits	The extreme center of gravity locations within which the airplane must be operated at a given weight.
Usable Fuel	Fuel available for flight planning.
Unusable Fuel	Fuel remaining after a runout test has been completed in accordance with governmental regulations.
Standard Empty Weight	Weight of a standard airplane including unusable fuel, full operating fluids and full oil.
Basic Empty Weight	Standard empty weight plus optional equipment.

Payload	Weight of occupants, cargo and baggage.
Useful Load	Difference between take-off weight, or ramp weight if applicable, and basic empty weight.
Maximum Ramp Weight	Maximum weight approved for ground maneuvering. (It includes weight of start, taxi, and run-up fuel).
Maximum Take-off Weight	Maximum weight approved for the start of the take-off run.
Maximum Landing Weight	Maximum weight approved for the landing touchdown.
Zero Fuel Weight	Weight exclusive of usable fuel.
Tare	The weight of chocks, blocks, stands, etc., used on the scales when weighing an airplane.
Leveling Points	Those points which are used during the weighing process to level the airplane.
Jack Points	Points on the airplane identified by the manufacturer as suitable for supporting the airplane for weighing or other purposes.

SECTION II

LIMITATIONS

TABLE OF CONTENTS

SUBJECT	*PAGE*
Airspeed Limitations	2-3
Airspeed Indicator Markings	2-4
Power Plant Limitations	
Engine	2-4
Operating Limitations	2-5
Fuel Grades	2-5
Fuel Additives	2-5
Oil Specifications	2-5
Propeller Specifications	2-5
Power Plant Instrument Markings	2-6
Miscellaneous Instrument Markings	2-6
Weight Limits	2-7
Center of Gravity Limits	2-7
Reference Datum	2-8
Maneuver Limits	2-8
Flight Load Factors	2-9
Minimum Flight Crew	2-9
Kinds of Operation Limits	2-10
Equipment Required for Various Conditions of Flight	2-10
Fuel	2-19
Total Fuel	2-19
Fuel Management	2-19
Placards	2-20 - 2-29

The limitations included in this section have been approved by the Federal Aviation Administration.

The following limitations must be observed in the operation of this airplane.

AIRSPEED LIMITATIONS

SPEED	CAS		IAS		REMARKS
	KNOTS	MPH	KNOTS	MPH	
Never Exceed V_{NE}	152	175	152	175	Do not exceed this speed in any operation
Maximum Structural Cruising V_{NO} or V_C	133	153	134	154	Do not exceed this speed except in smooth air and then only with caution
Maneuvering V_A	116	133	115	132	Do not make full or abrupt control movements above this speed
Maximum Flap Extension/ Extended V_{FE}	96	110	97	111	Do not extend flaps or operate with flaps extended above this speed

*AIRSPEED INDICATOR MARKINGS

MARKING	CAS		IAS		SIGNIFICANCE
	KTS	MPH	KTS	MPH	
White Arc	50-96	57-110	48-97	55-111	Full Flap Operating Range
Green Arc	60-133	69-153	58-134	67-154	Normal Operating Range
Yellow Arc	133-152	153-175	134-152	154-175	Operate With Caution, Only in Smooth Air
Red Line	152	175	152	175	Maximum Speed For All Operations

* The limits of the arcs on the airspeed indicator are marked in CAS values.

POWER PLANT LIMITATIONS

ENGINE

One Avco Lycoming engine model O-320-E2B, O-320-E2C or O-320-E3D engine rated at 150 hp.

Take-off and Maximum
Continuous Power ..... Full Throttle or 2700 rpm whichever occurs first

OPERATING LIMITATIONS

Engine Speed ..... 2700 rpm
*Oil Temperature ..... 245°F
Oil Pressure
Minimum ..... 25 psi
Maximum ..... 100 psi
Fuel Pressure
Minimum ..... 0.5 psi
Maximum ..... 6.0 psi
Mixture - Set per leaning instructions on performance charts.

*All temperatures are established for a 100°F day.

FUEL GRADES

Aviation Gasoline 80/87 (red) minimum grade or 100LL (blue) or 100 (green).

FUEL ADDITIVES

Alcor TCP Concentrate mixed according to the instructions provided by Alcor, Inc.

OIL SPECIFICATIONS

Avco Lycoming Specification Number 301E approves for use lubricating oils which conform to both MIL-L-6082B straight mineral type and MIL-L-22851 ashless dispersant lubricants for airplane engines. Refer to the Approved Engine Oils table in the HANDLING, SERVICING AND MAINTENANCE section for a list of approved products.

PROPELLER SPECIFICATIONS

Sensenich M74DM-0-58 or 74DM6-0-58 fixed-pitch, two-blade propeller. Static rpm at maximum permissible throttle settings: Not over 2400 rpm and not under 2300 rpm. No additional tolerance permitted. Diameter 74 inches, no cutoff permitted.

POWER PLANT INSTRUMENT MARKINGS

OIL TEMPERATURE
- Caution (Yellow Arc) ..... 60° to 120°F
- Operating Range (Green Arc) ..... 120° to 245°F
- Maximum (Red Line) ..... 245°F

OIL PRESSURE
- Minimum Pressure (Yellow Arc) ..... 25 to 60 psi
- Operating Range (Green Arc) ..... 60 to 90 psi
- Maximum Pressure (Red Line) ..... 100 psi

FUEL PRESSURE
- Operating Range (Green Arc) ..... 0.5 to 6.0 psi

TACHOMETER
- Engine Warm-up ..... 800 to 1200 rpm
- Normal Operating Range (Green Arc) ..... 2200 to 2700 rpm
- Maximum RPM (Red Radial) ..... 2700 rpm

MISCELLANEOUS INSTRUMENT MARKINGS

INSTRUMENT AIR
- Operating Range (Green Arc) ..... 4.3 to 5.9 in. Hg

FUEL QUANTITY

After compliance with BEECHCRAFT S.I. No. 0624-281
- Yellow Band ..... E to 3/8 full

WEIGHT LIMITS

NORMAL CATEGORY (A23-19)

Maximum Ramp Weight ..... 2205 lbs
Maximum Take-off
and Landing Weight ..... 2200 lbs
Zero Fuel Weight ..... No structural Limitation
Maximum Baggage Compartment
Load ..... 340 lbs

NORMAL CATEGORY (19A) (A23-19 when BEECHCRAFT Kit 23-5003 is installed)

Maximum Ramp Weight ..... 2255 lbs
Maximum Take-off
and Landing Weight ..... 2250 lbs
Zero Fuel Weight ..... No Structural Limitation
Maximum Baggage Compartment
Load ..... 340 lbs

UTILITY CATEGORY (A23-19)
UTILITY/ACROBATIC CATEGORY (19A)

Maximum Ramp Weight ..... 2035 lbs
Maximum Take-off
and Landing Weight ..... 2030 lbs
Zero Fuel Weight ..... No Structural Limitation
Maximum Baggage Compartment
Load (Utility Category Only) ..... 340 lbs

CENTER OF GRAVITY LIMITS

NORMAL CATEGORY (A23-19)

Forward: 107.8 inches aft of datum to 1800 lbs with straight line variation to 112.0 inches at 2200 lbs.

Aft: 118.3 inches aft of datum at all weights.

NORMAL CATEGORY (19A) (A23-19 when BEECHCRAFT Kit 23-5003 is installed)

Forward: 107.8 inches aft of datum to 1800 lbs with straight line variation to 112.5 at 2250 lbs.

Aft: 118.3 inches aft of datum at all weights.

UTILITY/ACROBATIC CATEGORY

Forward: 107.8 inches aft of datum to 1800 lbs with straight line variation to 110.2 inches aft of datum at 2030 lbs.

Aft: 114.0 inches aft of datum at all weights.

REFERENCE DATUM

Datum is 103 inches forward of wing leading edge.

MAC length is 52.7 inches.

MANEUVER LIMITS

The A23-19 and 19A airplane is approved for 4 place in the Normal Category and for 2 place in the Utility Category. The 19A is also approved for 2 place in the Acrobatic Category. Maximum slip duration is 30 seconds.

NORMAL CATEGORY (2250 POUNDS & 2200 POUNDS)
No acrobatic maneuvers approved.

UTILITY CATEGORY (2030 POUNDS)
No acrobatic maneuvers are approved except those listed below.

MANEUVER	*ENTRY SPEED (CAS)*
Chandelle	116 kts/133 mph
Steep Turn	116 kts/133 mph
Lazy Eight	116 kts/133 mph
Stall (Except Whip)	Use slow deceleration

ACROBATIC CATEGORY (19A) (2030 POUNDS)
For additional approved acrobatic maneuvers see Pilot's Operating Handbook and FAA Approved Airplane Flight Manual Supplement.

FLIGHT LOAD FACTORS

NORMAL CATEGORY (2250 POUNDS & 2200 POUNDS)

Flight maneuvering load factors

Flaps Up	+3.8, -1.9
Flaps Down	+1.9

UTILITY CATEGORY (2030 POUNDS)

Flight maneuvering load factors

Flaps Up	+4.4, -2.2
Flaps Down	+2.2

ACROBATIC CATEGORY (19A) (2030 POUNDS)

Flight maneuvering load factors

Flaps Up	+6.0, -3.0
Flaps Down	+2.0

MINIMUM FLIGHT CREW

One (1) Pilot

KINDS OF OPERATION LIMITS

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

REQUIRED EQUIPMENT FOR VARIOUS CONDITIONS OF FLIGHT

Federal Aviation Regulations (91.3(a), 91.24, 91.25, 91.32, 91.33, 91.52, 91.90, 91.97, 91.170) specify the minimum numbers and types of airplane instruments and equipment which must be installed and operable for various kinds of flight conditions. This includes VFR day, VFR night, IFR day, and IFR night.

Regulations also require that all airplanes be certificated by the manufacturer for operations under various flight conditions. At certification, all required equipment must be in operating condition and should be maintained to assure continued airworthiness. If deviations from the installed equipment were not permitted, or if the operating rules did not provide for various flight conditions, the airplane could not be flown unless all equipment was operable. With appropriate limitations, the operation of every system or component installed in the airplane is not necessary, when the remaining operative instruments and equipment provide for continued safe operation. Operation in accordance with limitations established to maintain airworthiness, can permit continued or uninterrupted operation of the airplane temporarily.

For the sake of brevity, the Required Equipment Listing does not include obviously required items such as wings, rudders, flaps, engine, landing gear, etc. Also the list does not include items which do not affect the airworthiness of

the airplane such as entertainment systems, passenger convenience items, etc. However, it is important to note that ALL ITEMS WHICH ARE RELATED TO THE AIRWORTHINESS OF THE AIRPLANE AND NOT INCLUDED ON THE LIST ARE AUTOMATICALLY REQUIRED TO BE OPERATIVE.

To enable the pilot to rapidly determine the FAA equipment requirements necessary for a flight into specific conditions, the following equipment requirements and exceptions are presented. It is the final responsibility of the pilot to determine whether the lack of, or inoperative status of a piece of equipment on his airplane, will limit the conditions under which he may operate the airplane.

WARNING

FLIGHT IN KNOWN ICING CONDITIONS PROHIBITED.

LEGEND

Numbers refer to quantities required to be operative for a specified condition.

(-) Indicates that the item may be inoperative for the specified condition.

(*) Refer to the REMARKS AND/OR EXCEPTIONS column for explicit information or reference.

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
GENERAL					
Overwater flight	*	*	*	*	-*Per FAR 91.33
COMMUNICATIONS					
VHF communications system	*	*	*	*	-*Per FAR 91.33
ELECTRICAL POWER					
Battery	1	1	1	1	
DC alternator	1	1	1	1	

EQUIPMENT AND FURNISHING					
Seat belts	1	1	1	1	- Per Person or Per FAR 91.33
Shoulder harness (19A)	*	-	-	-	-*As required for acrobatic flight
Emergency locator transmitter	1	1	1	1	- Per FAR 91.52
FIRE PROTECTION					
Portable fire extinguisher	*	*	*	*	-*Optional

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
FLIGHT CONTROLS					
Stabilator trim tab indicator	1	1	1	1	- May be inoperative for ferry flight provided tabs are visually checked in the neutral position prior to takeoff and checked for full range of operation.
Flap position indicator (On electric flap system)	1	1	1	1	- May be inoperative provided flap travel is visually inspected prior to takeoff.
Stall warning	1	1	1	1	

FUEL EQUIPMENT					
Fuel boost pump	1	1	1	1	
Engine driven fuel pump	1	1	1	1	
Fuel quantity indicator	2	2	2	2	- One may be inoperative provided other side is operational and amount of fuel on board can be established to be adequate for the intended flight.
Fuel pressure indicator	1	1	1	1	
ICE AND RAIN PROTECTION					
Emergency static air source	*	*	*	*	-*Optional
Pitot heater	*	*	1	1	-*Optional

SYSTEM and/or COMPONENT	VFR Day	VFR Night	IFR Day	IFR Night	Remarks and/or Exceptions
LIGHTS					
Cockpit and instrument lights	-	*	-	*	-*Lights must be operative.
Landing light	-	*	-	*	-*Per FAR 91.33
Rotating beacon	*	1	*	1	-*Optional
Position light	-	3	-	3	

NAVIGATION INSTRUMENTS					
Altimeter	1	1	1	1	
Airspeed indicator	1	1	1	1	
Vertical speed	-	-	-	-	
Magnetic compass	1	1	1	1	
Attitude indicator	-	-	1	1	
Turn coordinator	-	-	1	1	
Directional gyro	-	-	1	1	
Clock	-	-	1	1	
Transponder	*	*	*	*	-*Per FAR 91.24, 91.90, 91.97
Navigation equipment	-	-	*	*	-*Per FAR 91.33
VACUUM					
Vacuum system for instrument air	-	-	1	1	
Vacuum gage	-	-	1	1	

SYSTEM and/or COMPONENT	*VFR Day*	*VFR Night*	*IFR Day*	*IFR Night*	*Remarks and/or Exceptions*
ENGINE INDICATING INSTRUMENTS					
Engine tachometer indicator	1	1	1	1	
Exhaust gas temperature indicator	*	*	*	*	-*Optional
ENGINE OIL INSTRUMENTS					
Oil pressure indicator	1	1	1	1	
Oil temperature indicator	1	1	1	1	

FUEL

TOTAL FUEL with left and right wing fuel systems full:

Two *29.9-gallon tanks in wings with a total of *58.8 gallons usable.

After compliance with BEECHCRAFT S.I. No. 0624-281:

Two *29.9-gallon tanks in wings with a total of *52.2 gallons usable.

*Value given is nominal. Tank capacity will vary with temperature and manufacturing tolerances.

FUEL MANAGEMENT

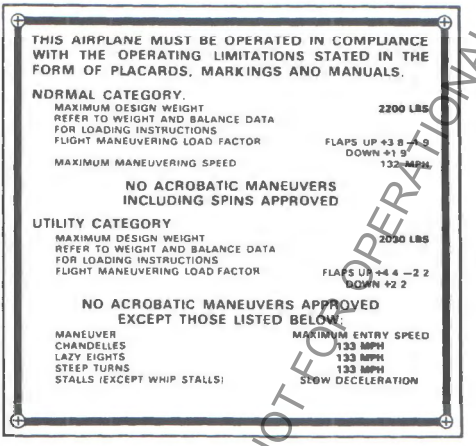
Do not take off when the Fuel Quantity Gages indicate in the *Yellow Band or with less than 11 gallons in each main tank.

Maximum slip duration: 30 seconds

*Yellow band was installed by BEECHCRAFT S.I. No. 0624-281.

PLACARDS

On Left Cabin Door or Left Side Panel (CAS) (MB-1 thru MB-252)



On Left Cabin Door or Left Side Panel (CAS) (MB-253 thru MB-288)

On Left Cabin Door or Left Side Panel (CAS) (MB-289 thru MB-460)

(Airplanes prior to MB-289 when BEECHCRAFT Kit 23-5003 is installed)

On Left Cabin Door or Left Side Panel (MB-1 thru MB-252 after compliance with BEECHCRAFT Service Bulletin 67-23 Revision 1)

NOTE:
MAXIMUM ALTITUDE LOSS DURING STALL 300 FT.

PLACARDS (Cont'd)

On Left Cabin Door or Left Side Panel (CAS) (Model 19A, MB-322 thru MB-454, ACROBATIC)

THIS AIRPLANE MUST BE OPERATED IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS

NORMAL CATEGORY

MAXIMUM DESIGN WEIGHT		2250 LBS
REFER TO WEIGHT AND BALANCE DATA FOR LOADING INSTRUCTIONS		
FLIGHT MANEUVERING LOAD FACTOR	FLAPS UP	+3.8 −1.9
	DOWN	+1.9
MAXIMUM MANEUVERING SPEED		132 MPH

NO ACROBATIC MANEUVERS INCLUDING SPINS APPROVED

UTILITY & ACROBATIC CATEGORY

MAXIMUM DESIGN WEIGHT		2030 LBS
REFER TO WEIGHT AND BALANCE DATA FOR LOADING INSTRUCTIONS		
FLIGHT MANEUVERING LOAD FACTOR	FLAPS UP	+6.0 −3.0
	DOWN	+2.0

NO ACROBATIC MANEUVERS APPROVED EXCEPT THOSE LISTED BELOW:

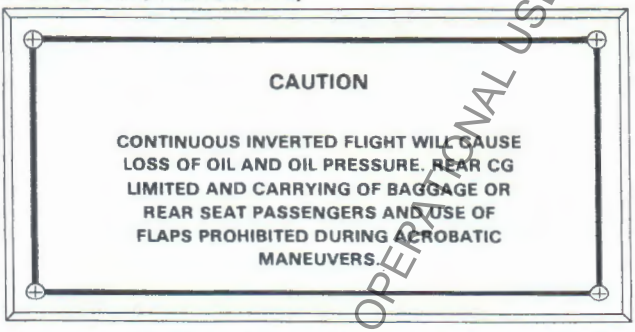
MANEUVER	MAXIMUM ENTRY SPEED
CHANDELLES	133 MPH
LAZY EIGHTS	133 MPH
STEEP TURNS	133 MPH
STALLS (EXCEPT WHIP STALLS)	SLOW DECELERATION
NOTE: MAXIMUM ALTITUDE LOSS DURING STALL	300 FT
SPINS (FOR OPERATIONAL LIMITATIONS, SEE PLACARD ON SUN VISOR)	

	RECOMMENDED ENTRY SPEED
BARREL ROLL	130 MPH
AILERON ROLL	130 MPH
SNAP ROLL	100 MPH
SPLIT S	90 MPH
IMMELMANN	150 MPH
LOOP	140 MPH

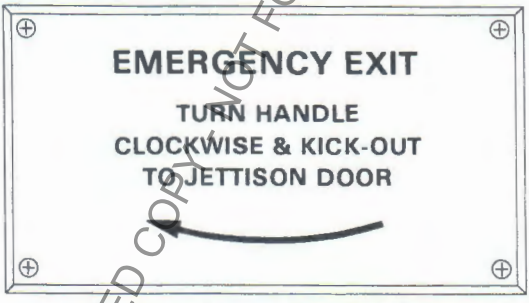
On Right and Left Cabin Doors: (Model 19A, MB-450 thru MB-454, ACROBATIC)

REMOVE DOOR HOLD-OPEN ROD PRIOR TO OPERATION IN ACROBATIC CATEGORY

On Right Side of Instrument Panel: (Model 19A, MB-322 thru MB-454, ACROBATIC)



On Left Cabin Door: (Model 19A, MB-322 thru MB-454, ACROBATIC)



On Right Cabin Door: (Model 19A, MB-322 thru MB-454, ACROBATIC)

PLACARDS (Cont'd)

On Sunvisor Above Pilot's Seat: (Model 19A, MB-322 thru MB-454 after compliance with BEECHCRAFT S.I. No. 0871-090, ACROBATIC)

OPERATIONAL LIMITATIONS

SPINS:

The airplane will not spin if orthodox entry is used, but will enter a spiral dive. Speed builds up rapidly in a spiral dive, requiring high pullout loads; therefore, if a spiral is inadvertently entered recovery from the spiral is to be initiated within two turns.

ENTRY: Stall the airplane with the control column hard back, power off, flaps up, carburetor heat as required and with the nose about 15° above the horizon. At the stall, apply full rudder in the direction required to spin. A slight rudder application immediately before the stall will assure the direction of spin. The airplane nose will drop and rotate towards the applied rudder. When the wings are 90° to the horizon, apply full aileron against (i.e. against the intended direction of spin). The airplane will go slightly inverted and enter a normal spin.

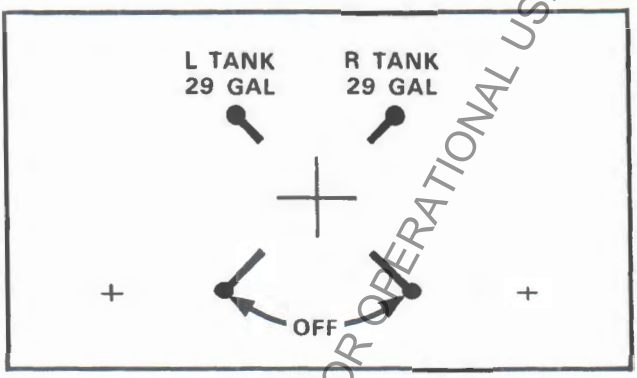
If aileron against is not applied or applied too late, the airplane will enter a rapid spiral dive, and recovery must be initiated by the second turn.

If the full back stick is not applied and held, the airplane may spiral. Again recovery must be initiated not later than the second turn.

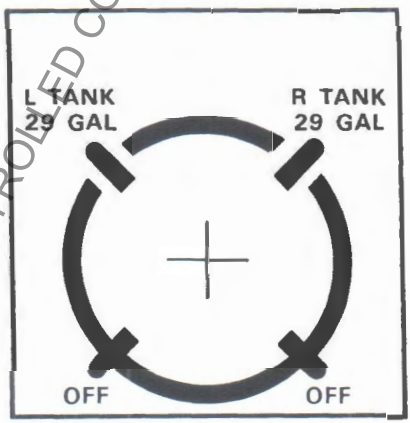
If aileron is applied too early, the airplane will not rotate and merely remain in a straight stalled condition.

RECOVERY: THE AIRPLANE WILL RECOVER FROM ANY SPIN WHEN POSITIVE CORRECTIVE ACTION IS TAKEN: SIMULTANEOUSLY REVERSE RUDDER AND ELEVATOR WITH AILERON NEUTRAL. ALL CONTROLS SHOULD BE NEUTRALIZED AS ROTATION STOPS.

On Fuel Selector Panel: (MB-1 thru MB-288)

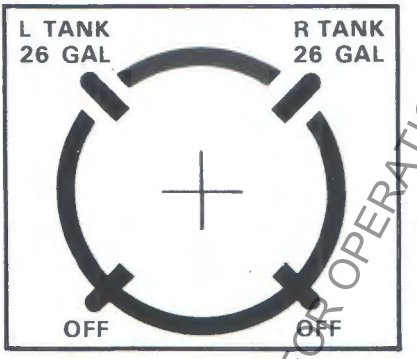


On Fuel Selector Panel: (after compliance with BEECHCRAFT S.I. No. 0838)



PLACARDS (Cont'd)

On Fuel Selector Panel: (after compliance with BEECHCRAFT S.I. No. 0624-281 and S.I. No. 0838)



Adjacent to Engine Instrument Cluster: (after compliance with BEECHCRAFT S.I. No. 0624-281)

DO NOT TAKE OFF WHEN FUEL QUANTITY GAUGE INDICATES IN YELLOW OR WITH LESS THAN 11 GALLONS IN EACH MAIN TANK. MAXIMUM SLIP DURATION IS 30 SECONDS

On Upper Right Instrument Panel:

RAISE FLAPS TO
INCREASE BRAKE EFFECTIVENESS

On Flap Extension Handle (CAS):

FLAPS PULL TO EXTEND, MAX SPEED 110 MPH

RETRACTED	0°
FIRST NOTCH	15°
SECOND NOTCH	25°
THIRD NOTCH	35°

Temporary Change to the Pilot's Operating Handbook *and* FAA Approved Airplane Flight Manual

P/N 169-590002-7TC1

Publication Affected	A23-19 and 19A Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (P/N 169-590002-7, Issued October, 1979 or Subsequent)
Airplane Serial Numbers Affected	MB-1 thru MB-460
Description of Change	The addition of a placard to the fuel selector to warn of the no-flow condition that exists between the fuel selector detents.
Filing Instructions	Insert this temporary change into the A23-19 and 19A Pilot's Operating Handbook and FAA Approved Airplane Flight Manual immediately following page 2-26 (Section II, LIMITATIONS) and retain until rescinded or replaced.

LIMITATIONS

PLACARDS

Located On The Face Of The Fuel Selector Valve, For Those Airplanes In Compliance With S.B. 2670:

WARNING - POSITION SELECTOR IN DETENTS ONLY - NO FUEL FLOW TO ENGINE BETWEEN DETENTS

Approved:

A.C. Jackson
Raytheon Aircraft Company
DOA CE-2

On Left Side Panel:

TO LEVEL AIRCRAFT – LEVEL
BAGGAGE COMPARTMENT FLOOR

On Aft Cabin Bulkhead:

BAGGAGE COMPARTMENT
340 POUNDS
MAXIMUM CAPACITY

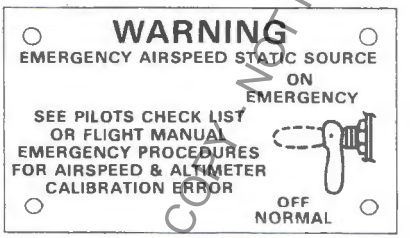
On Aft Cabin Bulkhead: (Optional with family seat installed)

HAT SHELF
NO HEAVY OBJECTS

PLACARDS (Cont'd)

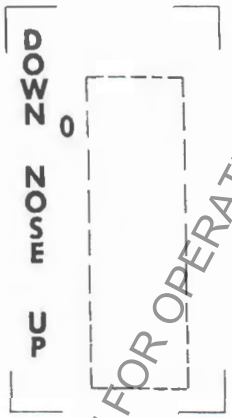
Lower Sidewall Adjacent to Pilot (when installed):

or



or

On Pedestal Between Front Seats:



INTENTIONALLY LEFT BLANK

SECTION III

EMERGENCY PROCEDURES

TABLE OF CONTENTS

SUBJECT	*PAGE*
Emergency Airspeeds	3-3
Engine Failure	
During Take-Off Ground Roll	3-4
After Liftoff And In Flight	3-4
Engine Discrepancy Checks	
Rough Running Engine	3-5
Loss Of Engine Power	3-5
Airstart Procedure	3-6
Engine Fire	
In Flight	3-6
On The Ground	3-7
Emergency Descent	3-7
Maximum Glide Configuration	3-7
Landing Emergencies	
Landing Without Power	3-8
Systems Emergencies	
Alternator-Out Procedure	3-8
Unscheduled Electric Stabilator Trim	3-9
Emergency Static Air Source System	3-9
Unlatched Door In Flight	3-10
Spins	3-10
Entry	3-10
Spin Recovery	3-11

INTENTIONALLY LEFT BLANK

All airspeeds quoted in this section are indicated airspeeds (IAS).

EMERGENCY AIRSPEEDS

Emergency Descent	132 kts/153 mph
Glide	78 kts/90 mph
Emergency Landing Approach	65 kts/75 mph

Stall warning horn is inoperative when BATTERY & ALT switch is turned off.

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. Where practicable, the emergencies requiring immediate corrective action are treated in check list form for easy reference and familiarization. Other situations, in which more time is usually permitted to decide on and execute a plan of action, are discussed at some length.

ENGINE FAILURE

DURING TAKE-OFF GROUND ROLL

1. Throttle - CLOSED
2. Braking - MAXIMUM

NOTE

Conduct the following procedures immediately if it appears certain that the airplane will run off the runway. (Otherwise conduct these procedures at the pilot's discretion.)

3. Fuel Selector Valve - OFF
4. BATTERY & ALT, ALT, and FUEL BOOST switches - OFF
5. Magneto/Start Switch - OFF

AFTER LIFTOFF AND IN FLIGHT

Landing straight ahead is usually advisable. If sufficient altitude is available for maneuvering, accomplish the following:

1. Mixture - FULL RICH, then LEAN as required
2. Fuel Boost Pump - ON
3. Fuel Selector Valve - SELECT OTHER TANK (Check to feel detent and check visually)
4. Magnetos - CHECK LEFT and RIGHT, then BOTH

NOTE

The most probable cause of engine failure would be loss of fuel flow or improper functioning of the ignition system.

IF NO RESTART:

1. Establish maximum glide
2. Throttle - CLOSE
3. Fuel Selector Valve - OFF
4. Mixture - IDLE CUT-OFF
5. Magneto/Start Switch - OFF
6. BATTERY & ALT, ALT, and FUEL BOOST switches - OFF (With electric flaps installed, it will be necessary to set desired flaps before securing battery.)

When certain of reaching the selected landing site:

7. Airspeed - 65 kts/75 mph
8. Flaps - AS REQUIRED

ENGINE DISCREPANCY CHECKS

CONDITION: ROUGH RUNNING ENGINE

1. Mixture - FULL RICH, then LEAN as required
2. Magneto/Start Switch - CHECK LEFT and RIGHT, then BOTH

CONDITION: LOSS OF ENGINE POWER

1. Fuel Pressure Gage - CHECK

If fuel flow is abnormally low:

a. Mixture - FULL RICH
b. Fuel Boost Pump - ON (Lean as required)
c. Fuel Boost Pump - OFF if performance does not improve in a few moments

2. Fuel Quantity Indicator - CHECK for fuel supply in tank being used

If tank being used is empty:

a. Fuel Tank Selector Valve - SELECT OTHER FUEL TANK (feel for detent and check visually)
b. Fuel Boost Pump - ON

AIR START PROCEDURE

1. Fuel Selector Valve - SELECT TANK MORE NEARLY FULL (check to feel detent and check visually)
2. Throttle - FULL FORWARD
3. Mixture - FULL RICH
4. Fuel Boost Pump - ON until power is regained, then OFF. (Leave on if engine driven fuel pump is inoperative.)
5. Throttle - ADJUST to desired power
6. Mixture - LEAN as required

ENGINE FIRE

IN FLIGHT

The ventilation controls must be closed to shut off all heating system outlets so that smoke and fumes will not enter the cabin. The control labeled CABIN AIR must be pulled out to close. The control labeled DEFROST must be pushed in to close. In the event of an engine fire, shut down the engine as follows and make a landing:

1. Fuel Selector Valve - OFF
2. Mixture - IDLE CUT-OFF
3. Throttle - CLOSE
4. Cabin Air Control - pull OFF
5. Defrost Valve - push OFF
6. BATTERY & ALT switch - OFF
7. Magneto/Start Switch - OFF
8. Do not attempt to restart engine

ON THE GROUND

1. Fuel Selector Valve - OFF
2. Throttle - CLOSED
3. Mixture - IDLE CUT-OFF
4. BATTERY & ALT and Magneto/Start Switches - OFF
5. Extinguish with Fire Extinguisher.

EMERGENCY DESCENT

1. Throttle - IDLE
2. Airspeed - ESTABLISH 132 kts/153 mph

MAXIMUM GLIDE CONFIGURATION

1. Flaps - UP
2. Airspeed - 78 kts/90 mph

Glide distance (Zero Wind Condition) is approximately 1.7 nautical miles (2 statute miles) per 1000 feet of altitude above the terrain.

LANDING EMERGENCIES

LANDING WITHOUT POWER

When assured of reaching the landing site selected, and on final approach:

1. Airspeed - 65 kts/75 mph
2. Fuel Selector Valve - OFF
3. Mixture - IDLE CUT-OFF
4. Magneto/Start Switch - OFF
5. Flaps - AS REQUIRED
6. BATTERY & ALT, ALT, and FUEL BOOST Switches - OFF

SYSTEMS EMERGENCIES

ALTERNATOR-OUT PROCEDURE

A failure of the alternator will place the entire electrical operation of the airplane on the battery. Alternator failure will be indicated by a discharging or fluctuating ammeter. If this condition develops, turn the ALT switch to OFF. Turn off all nonessential electrical load to conserve the battery life.

WARNING

Deactivation of the battery/alternator switch, alternator switch, or alternator circuit breaker during flight is prohibited, except as required by an actual emergency.

UNSCHEDULED ELECTRIC STABILATOR TRIM

1. Airplane Attitude - MAINTAIN using stabilator control.
2. Stabilator Trim Thumb Switch (On Control Wheel) - MOVE IN DIRECTION OPPOSITE UNSCHEDULED PITCH TRIM to open circuit breaker.
3. Stabilator Trim ON-OFF Switch (On Instrument Panel) - OFF
4. Manual Stabilator Trim Control Wheel - RETRIM AS DESIRED.

EMERGENCY STATIC AIR SOURCE SYSTEM

THE EMERGENCY 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 obstructions 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 emergency 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 Emergency Static Air System is desired for use:

1. Pilot's Emergency Static Air Source - Switch to ON EMERGENCY.
2. For Airspeed Calibration and Altimeter Correction, refer to PERFORMANCE section.

CAUTION

Be certain the emergency static air valve is in the NORMAL position when system is not needed.

UNLATCHED DOOR IN FLIGHT

If the cabin door is not locked it may come unlatched in flight. This may occur during or just after take-off. The door will trail in a position approximately 3 inches open. A buffet may be encountered with the door open in flight. Return to the field in a normal manner. If practicable, during the landing flare-out have a passenger hold the door to prevent it from swinging open.

SPINS (MB-322 thru MB-454)

WARNING

Intentional spins are prohibited when operating in the Normal Category. Intentional spins are also prohibited in the Utility Category unless the airplane is approved for operation in the Acrobatic Category and has complied with BEECHCRAFT S.I. No. 0871-090.

The airplane will not spin if orthodox entry is used, but will enter a spiral dive. Speed builds rapidly in a spiral dive, requiring high pullout loads. Therefore, if a spiral is inadvertently entered recovery from the spiral is to be initiated within two turns.

ENTRY

Stall the airplane with the control column hard back, throttle in idle position, flaps up, carburetor heat as required and with the nose about 15° above the horizon. At the stall, apply full rudder in the direction required to spin. A slight rudder application immediately before the

stall will assure the direction of spin. The airplane nose will drop and rotate towards the applied rudder. When the wings are 90° to the horizon, apply full aileron against the intended direction of spin. The airplane will go slightly inverted and enter a normal spin.

If aileron against the direction of spin is not applied or applied too late, the airplane will enter a rapid spiral dive, and recovery must be initiated by the second turn.

If the full back stick is not applied and held, the airplane may spiral. Again recovery must be initiated not later than the second turn.

If aileron is applied too early, the airplane will not rotate and merely remain in a straight stalled condition.

SPIN RECOVERY

From spins entered intentionally or inadvertently:

Immediately move the control column full forward and simultaneously apply full rudder opposite to the direction of the spin; continue to hold this control position until rotation stops and then neutralize all controls and execute a smooth pullout. Ailerons should be neutral and throttle in idle position at all times during recovery.

INTENTIONALLY LEFT BLANK

SECTION IV

NORMAL PROCEDURES

TABLE OF CONTENTS

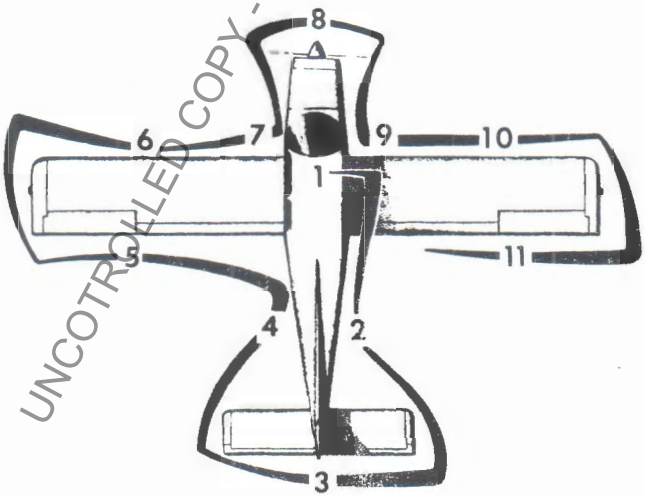
SUBJECT	*PAGE*
Speeds for Safe Operation	4-3
Preflight Inspection	4-4
Before Starting	4-6
External Power	4-6
Starting Engine Using Auxiliary Power Unit	4-7
Starting	4-7
After Starting, And Before Taxi	4-8
Before Takeoff	4-8
Takeoff	4-9
Climb	4-10
Cruise	4-10
Leaning Using the Exhaust Gas Temperature Indicator	4-10
Descent	4-11
Before Landing	4-11
Balked Landing	4-12
After Landing	4-12
Shutdown	4-12
Environmental Systems	4-12
Heating and Ventilation	4-12
Cold Weather Operation	4-13
Preflight Inspection	4-13
Engine	4-13
Icing Conditions	4-14
Engine Break-In Information	4-14

INTENTIONALLY LEFT BLANK

All airspeeds quoted in this section are indicated airspeeds (IAS)

SPEEDS FOR SAFE OPERATION

Take-off	
Lift-off	65 Knots/75 mph
50 Ft.	72 Knots/83 mph
Maximum Climb	
Best Rate (V_Y)	72 Knots/83 mph
Best Angle (V_X)	65 Knots/75 mph
Cruise Climb	89 Knots/100 mph
Maximum Turbulent Air Penetration	114 Knots/131 mph
Balked Landing	58 Knots/67 mph
Landing Approach	65 Knots/75 mph
Maximum Demonstrated Crosswind	13 Knots/15 mph



PREFLIGHT INSPECTION

Emergency Locator Transmitter - ARMED
Location may vary with individual airplanes

1. *CABIN:*
   a. Parking Brake - SET
   b. Control Lock - REMOVE
   c. All Switches - OFF

2. *RIGHT FUSELAGE:*
   a. Static Pressure Button - UNOBSTRUCTED

3. *EMPENNAGE:*
   a. Control Surfaces - CHECK
   b. Tie Down - REMOVE
   c. Position Light - CHECK

4. *LEFT FUSELAGE:*
   a. Static Pressure Button - UNOBSTRUCTED
   b. All Antennas - CHECK

5. *LEFT WING TRAILING EDGE:*
   a. Flap - CHECK
   b. Fuel Vent Line - UNOBSTRUCTED
   c. Aileron - CHECK
   d. Wing Tip - CHECK
   e. Position Light - CHECK

6. *LEFT WING LEADING EDGE:*
   a. Pitot Tube - CHECK, (Remove Cover)
   b. Landing Light - CHECK
   c. Tie Down and Chocks - REMOVE
   d. Stall Warning - CHECK for movement of vane
   e. Fuel Tank - CHECK QUANTITY; Filler Cap - SECURE.

7. *LEFT LANDING GEAR:*
   a. Tire and Brake - CHECK
   b. Fuel Sump - DRAIN

8. *NOSE SECTION:*
   a. Left Cowl - SECURE
   b. Induction Air Intake - CLEAR, Filter - CHECK for condition and security of attachment.
   c. Propeller - CHECK, General Condition, Nicks, etc.
   d. Tire and Nose Gear - CHECK
   e. Engine Oil - CHECK (See Servicing, Section 8) Cap and Dipstick - SECURE
   f. Right Cowl - SECURE
   g. Fuel Strainer - DRAIN
   h. Chocks - REMOVE

9. *RIGHT LANDING GEAR:*
   a. Fuel Sump - DRAIN
   b. Tire and Brake - CHECK

10. *RIGHT WING LEADING EDGE:*
   a. Fuel Tank - CHECK QUANTITY; Filler Cap - SECURE
   b. Tie Down and Chocks - REMOVE
   c. Wing Tip - CHECK
   d. Position Light - CHECK

11. *RIGHT WING TRAILING EDGE:*
   a. Aileron - CHECK
   b. Flap - CHECK
   c. Fuel Tank Vent Line - UNOBSTRUCTED

BEFORE STARTING

1. Seats - POSITION AND LOCK; Seat Backs - UPRIGHT
2. Seat Belts and Shoulder Harnesses - FASTEN
3. Parking Brake - SET
4. All Avionics - OFF
5. Circuit Breakers - IN
6. Flaps - UP
7. Light Switches - AS REQUIRED
8. Electric Stabilator Trim Switch - OFF (if installed)
9. BATTERY & ALT Switch - ON
10. ALT Switch - ON (If external power is used, turn ALT Switch - OFF)
11. Fuel Boost Pump - ON (Check for operation, then OFF)
12. Fuel Selector - ROTATE thru 360° and check for freedom of movement, set on tank more nearly full (feel for detent and check visually)

WARNING

Do not take off if gages indicate in yellow arc on either gage (airplanes after compliance with BEECHCRAFT S.I. No. 0624-281).

EXTERNAL POWER

The following precautions shall be observed while using external power:

1. The Battery Switch shall be ON and all avionics and electrical switches OFF. This protects the voltage regulators and associated electrical equipment from voltage transients (power fluctuations):
2. The airplane has a negative ground system. Connect the positive and negative leads of the external power unit to the corresponding positive and negative terminals of the airplane's external power receptacle.
3. In order to prevent arcing, no power shall be supplied while the connection is being made.

STARTING ENGINE USING AUXILIARY POWER UNIT

1. Alternator, Electrical, and Avionics Equipment - OFF
2. Auxiliary Power Unit - CONNECT
3. Auxiliary Power Unit - SET OUTPUT (13.75 to 14.25 volts)
4. Auxiliary Power Unit - ON
5. Engine - START using normal procedures
6. Auxiliary Power Unit - OFF (after engine has been started)
7. Auxiliary Power Unit - DISCONNECT
8. Alternator Switch - ON

STARTING

CAUTION

Vernier-type engine controls should not be rotated clockwise after being advanced to the full forward position.

1. Mixture - FULL RICH
2. Throttle - FAST IDLE position
3. Fuel Boost Pump - ON (cold weather starts, use one to six strokes of engine prime, as required)

CAUTION

Starter cranking period should be limited to a maximum of 30 seconds, with at least 2 minutes between cranking periods.

4. Magneto/Start Switch - START position (release to BOTH position when engine fires)

CAUTION

DO NOT PUMP THROTTLE TO START

Flooded Engine:

a. Mixture - IDLE CUT-OFF
b. Throttle - FULL OPEN
c. Starter - ENGAGE (retard throttle to fast idle when engine fires)
d. Mixture - ADVANCE TO FULL RICH

5. External Power (if used) - OFF - DISCONNECT
6. ALT (alternator) Switch - ON
7. Oil Pressure - ABOVE RED RADIAL WITHIN 30 SECONDS
8. Warm-up - 800 to 1200 RPM
9. Engine Instruments - CHECK
10. Throttle - 1500 RPM
11. Ammeter - CHECK

CAUTION

Charge indication should begin to decrease within 2 minutes after engine start and should be within 1/4 scale of zero prior to takeoff. If not, an electrical difficulty is indicated, and the airplane should be shut down.

12. Throttle - IDLE
13. Fuel Boost Pump - OFF (for test of engine driven pump, then ON)

AFTER STARTING, AND BEFORE TAXI

1. Parking Brakes - RELEASE
2. Brakes - RELEASE AND CHECK
3. Avionics Equipment - ON, AS REQUIRED
4. Lights - AS REQUIRED

BEFORE TAKEOFF

1. Parking Brake - SET
2. Seat Belts and Shoulder Harnesses - CHECK

NOTE

All reclining seats must be in the upright position during take-off.

3. Avionics - CHECK
4. Engine Instruments - CHECK
5. Flight Instruments - CHECK AND SET
6. Throttle - 2000 RPM
7. Magnetos - CHECK at 2000 rpm, maximum drop of 125 rpm on each magneto, variance between individual magnetos should not exceed 50 rpm.
8. Carburetor Heat - CHECK (Set cold for takeoff)
9. Throttle - 1500 RPM
10. Ammeter - CHECK for stabilized indication within 1/4 scale of zero
11. Throttle - FAST IDLE
12. Stabilator Trim - TAKE-OFF RANGE (Green Band)
13. Flaps - CHECK and SET
14. Controls - CHECK FREE and for proper direction of travel
15. Fuel Boost Pump - CHECK ON
16. Mixture - FULL RICH (or as required by field elevation) (tighten friction on push-pull type control)
17. Doors and Window - SECURE
18. Parking Brake - RELEASE
19. Instruments - CHECK (engine instruments in green range at the start of the take-off run)

TAKEOFF

Takeoff ..... Full Throttle

1. Power - SET takeoff power and mixture before brake release.
2. Airspeed - ACCELERATE to and maintain take-off speed.
3. Airspeed - ESTABLISH DESIRED CLIMB SPEED when clear of obstacles.

CLIMB

NOTE

Do not turn Fuel Boost Pump off during climb.

1. Throttle - FULL FORWARD
2. Temperature - MONITOR
3. Mixture - LEAN AS REQUIRED FOR SMOOTH OPERATION

CRUISE

1. Power - SET AS DESIRED (Use tables in PERFORMANCE Section)
2. Fuel Boost Pump - OFF
3. Mixture - LEAN AS REQUIRED (tighten friction on push-pull type control)

LEANING USING THE EXHAUST GAS TEMPERATURE INDICATOR (EGT)

For level flight at 75% power or less, the EGT unit should be used in the following manner:

1. Lean the mixture and note the point on the indicator that the temperature peaks and starts to fall.
   a. CRUISE (LEAN) MIXTURE - Enrich mixture until the EGT shows a drop of 25°F below peak on the rich side of peak.
   b. BEST POWER MIXTURE - Enrich mixture until the EGT shows a drop of 75°F below peak on the rich side of peak.

CAUTION

Do not continue to lean mixture beyond that necessary to establish peak temperature.

2. Continuous operation is recommended at 25°F or more below peak EGT only on the rich side of peak.

3. Changes in altitude and power settings require the peak EGT to be rechecked and the mixture reset.

DESCENT

1. Altimeter - SET.
2. Carburetor Heat - WHEN REQUIRED.
3. Power - AS REQUIRED (avoid prolonged idle settings which may cause low cylinder head temperatures).
4. Mixture - ENRICH AS REQUIRED.

BEFORE LANDING

1. Seat Belts and Shoulder Harnesses - SECURE.

NOTE

All reclining seats must be in the upright position during landing.

2. Fuel Selector Valve - SELECT TANK MORE NEARLY FULL (feel for detent and check visually).
3. Mixture - FULL RICH (or as required by field elevation) (tighten friction on push-pull type control)
4. Landing Light - AS REQUIRED
5. Flaps - DOWN (maximum extension speed, 97 kts/111 mph)

NOTE

The Flaps Up landing procedure will increase the Flaps Down landing distances (total over 50 foot obstacle) by 50%.

6. Airspeed - ESTABLISH LANDING APPROACH SPEED
   Flaps Down - 65 kts/75 mph
7. Carburetor Heat - AS REQUIRED

NOTE

Carburetor heat should be in the full COLD (IN) position before full throttle application in the event of a go-around.

8. Fuel Boost Pump - ON

BALKED LANDING

1. Carburetor Heat - COLD
2. Power - FULL THROTTLE
3. Airspeed - 58 kts/67 mph until clear of obstacles, then trim to BEST RATE-OF-CLIMB
4. Flaps - UP

AFTER LANDING

1. Landing Light - AS REQUIRED
2. Flaps - UP
3. Trim Tab - SET TO 0°

SHUTDOWN

1. Brakes - SET
2. Fuel Boost Pump - OFF
3. Electrical and Avionics Equipment - OFF
4. Throttle - CLOSE
5. Mixture - IDLE CUT-OFF
6. Magneto/Start Switch - OFF, after engine stops
7. BATTERY & ALT Switch - OFF
8. ALT Switch - OFF
9. Control Lock - INSTALL, if conditions warrant.
10. Install wheel chocks and release brakes if the airplane is to be left unattended.

ENVIRONMENTAL SYSTEMS

HEATING AND VENTILATION

Refer to the SYSTEMS DESCRIPTION Section for operation of heating and ventilation controls.

COLD WEATHER OPERATION

PREFLIGHT INSPECTION

All accumulations of ice, snow and frost must be removed from the wings, tail, control surfaces and hinges, propeller, windshield, pitot tube, static ports, antennas, fuel cell filler caps, crankcase vents, and fuel vents. If such accumulations are not removed completely, the airplane shall not be flown. The deposits will not blow off in flight. While an adverse weight factor is clearly involved in the case of heavy deposits, it is less obvious that even slight accumulations will disturb or completely destroy the designed aerodynamic properties of the airfoils.

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

ENGINE

Use engine oil in accordance with Consumable Materials in the HANDLING, SERVICING AND MAINTENANCE Section.

WARNING

Ascertain that magneto switch and battery master switch are off before moving propeller by hand.

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.

During cold weather starts, use 1 to 6 strokes of engine primer, as required.

CAUTION

Do not pump throttle to start.

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 and engine sump 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.

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

NOTE

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

During warm-up, monitor engine temperatures closely, since it is quite possible to exceed the cylinder head temperature limit in trying to bring up the oil temperature.

During letdown and landing, give special attention to engine temperatures, since the engine will have a tendency toward overcooling.

ICING CONDITIONS

Flight in Known Icing Conditions Prohibited.

ENGINE BREAK-IN INFORMATION

See Systems Description section

SECTION V

PERFORMANCE

TABLE OF CONTENTS

SUBJECT	*PAGE*
Introduction to Performance and Flight Planning	5-3
Comments Pertinent to the Use of Performance Charts	5-7
Airspeed Calibration - Normal System	5-8
Airspeed Calibration - Alternate System	5-9
Altimeter Correction - Normal System	5-10
Altimeter Correction - Alternate System	5-11
Power Off Stall Speeds	5-12
Wind Components	5-13
Take-Off Distance - 2200	5-14
Take-Off Distance - 2250	5-15
Rate-of-Climb	5-16
Cruise Performance	5-17, 5-18
Landing Distance	5-19

INTENTIONALLY LEFT BLANK

INTRODUCTION TO PERFORMANCE AND FLIGHT PLANNING

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

The graphs and tables in this section present performance information for flight planning at various parameters of weight, power, altitude and temperature. Examples have been presented on some performance charts. Calculations for flight time, block speed and fuel required for a sample VFR trip from Denver to Wichita are detailed below. All examples and calculations assume the following conditions:

CONDITIONS

At Denver:

Outside Air Temperature ..... 15°C (59°F)
Field Elevation ..... 5330 ft
Altimeter Setting ..... 29.60 in. Hg
Wind ..... 270° at 10 kts
Runway 26L length ..... 10,010 ft

Route of Trip

*DEN-V4-GLD-V132-HUT-V73-ICT

For VFR Cruise at 9,500 feet

ROUTE SEGMENT	MAGNETIC COURSE	DIST NM	WIND 9500 FEET DIR/KTS	OAT 9500 FEET °C	ALT SETTING IN.HG
DEN-TXC	090°	72	010/20	-4	29.60
TXC-GLD	092°	73	010/20	-4	29.60
GLD-HUT	102°	194	220/10	-3	29.56
HUT-ICT	116°	28	220/10	1	29.56

*REFERENCE: Enroute Low Altitude Chart L-6

At Wichita:

Outside Air Temperature	25°C (77°F)
Field Elevation	1332 ft
Altimeter Setting	29.56 in. Hg
Wind	180° at 10 kts
Runway 19 Length	7301 ft

To determine pressure altitude at origin and destination airports, add 100 feet to field elevation for each .1 in. Hg below 29.92, and subtract 100 feet from field elevation for each .1 in. Hg above 29.92.

Pressure Altitude at DEN:

29.92 - 29.60 = .32 in. Hg

The pressure altitude at DEN is 320 feet above the field elevation.

5330 + 320 = 5650 ft

Pressure Altitude at ICT:

29.92 - 29.56 = .36 in. Hg

The pressure altitude at ICT is 360 feet above the field elevation.

1332 + 360 = 1692 ft

NOTE

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

Enter the CRUISE PERFORMANCE table for 2600 RPM at 9500 feet:

ALTITUDE FEET	THROTTLE SETTING RPM	FUEL FLOW GPH	TAS KNOTS
9500	2600	8.3	111

Time and fuel used were calculated as follows:

$$\text{Time} = \frac{\text{Distance}}{\text{Ground Speed}}$$

Fuel Used = (Time) (Fuel Flow)

Results are:

ROUTE SEGMENT	DISTANCE NM	EST GROUND SPEED KNOTS	TIME AT CRUISE ALTITUDE HRS: MIN	FUEL USED FOR CRUISE GAL
DEN-TXC	72	108	0:40	5.5
TXC-GLD	73	108	0:41	5.6
GLD-HUT	194	116	1:40	13.9
HUT-ICT	28	113	0:15	2.1

TIME - FUEL - DISTANCE

ITEM	TIME HRS: MINS	FUEL GAL	DISTANCE NM
Start, Runup, Taxi and Take-off acceleration	0:00	0.9	0
Cruise	3:16	27.1	367
Total	3:16	28.0	367

Total Flight Time: 3 hours, 16 minutes

Block Speed: 367 NM ÷ 3 hours, 16 minutes = 112 knots

Reserve Fuel (45 minutes at 2300 RPM, 9500 feet)

Enter the CRUISE PERFORMANCE table for 9500 feet and obtain fuel flow at 2300 RPM. The fuel flow is 6.2 gallons per hour.
Reserve fuel = (45 min) (6.2 GPH) = 4.7 gallons

Total Fuel = 28.0 + 4.7 = 32.7 gallons

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

Assumed ramp weight = 2205 lbs

Estimated fuel from DEN to ICT = (28.0 gal) (6 lbs/gal) = 168 lbs

Estimated landing weight = 2205 - 168 = 2037 lbs

COMMENTS PERTINENT TO THE USE OF PERFORMANCE CHARTS

1. The example, in addition to presenting an answer for a particular set of conditions, also presents the order in which the charts should normally be used, i.e., if the first item in the example is OAT, then enter the chart at the known OAT.

2. Indicated airspeeds (IAS) were obtained by using the AIRSPEED CALIBRATION NORMAL SYSTEM Chart.

3. 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 charts can only be achieved if specified conditions exist.

4. The full amount of usable fuel is available for all approved flight conditions.

5. Engine and component cooling has been demonstrated for temperatures up to 100°F at sea level with a 3.67°F per 1000 ft lapse rate. (ISA + 41°F)

AIRSPEED CALIBRATION - NORMAL SYSTEM

INDICATED AIRSPEED		CALIBRATED AIRSPEED			
		FLAPS UP		FLAPS DOWN	
KNOTS	MPH	KNOTS	MPH	KNOTS	MPH
40	46			42	48
45	52			47	54
50	58			51	59
55	63	58	67	56	64
60	69	62	71	61	70
65	75	66	76	65	75
70	81	70	81	69	79
75	86	75	86	73	84
80	92	80	92	78	90
85	98	85	98	83	95
90	104	90	104	88	101
95	109	95	109	93	107
100	115	100	115		
105	121	106	122		
110	127	111	128		
115	132	116	133		
120	138	120	138		
125	144	124	143		
130	150	128	147		

B23-KCI-9

AIRSPEED CALIBRATION - ALTERNATE SYSTEM

	STORM WINDOW CLOSED		STORM WINDOW OPEN	
	FLAPS UP	FLAPS DOWN	FLAPS UP	FLAPS DOWN
IAS (MPH)	IAS (MPH)	IAS (MPH)	IAS (MPH)	IAS (MPH)
70	75	74	80	79
80	86	84	90	89
90	96	94	111	99
100	107	105	121	109
110	117	115	132	119
120	127		142	
130	138		152	
140	148		162	
150	158			

B23-KCI-10

ALTIMETER CORRECTION - NORMAL SYSTEM

INDICATED AIRSPEED		ALTIMETER CORRECTION TO BE ADDED ~ FEET			
		FLAPS UP		FLAPS DOWN	
KNOTS	MPH	SL	10000 FT	SL	10000 FT
40	46			9	11
45	52			7	9
50	58			5	6
55	63			4	5
60	69	10	14	3	4
65	75	8	12	1	2
70	81	6	9	-6	-3
75	86	2	6	-17	-11
80	92	-4	-3	-23	-17
85	98	-5	-4	-26	-20
90	104	-4	-3		
95	109	-2	0		
100	115	1	3		
105	121	4	6		
110	127	7	9		

B23-KCI-11

ALTIMETER CORRECTION - ALTERNATE SYSTEM

IAS (MPH)	STORM WINDOW - CLOSED		STORM WINDOW - OPEN	
	FLAPS UP (FEET)	FLAPS DOWN (FEET)	FLAPS UP (FEET)	FLAPS DOWN (FEET)
70	20	20	45	40
80	30	25	60	50
90	40	30	70	60
100	50	35	85	70
110	60	40	95	80
120	70		110	
130	75		120	
140	85		135	
150			150	

POWER OFF STALL SPEEDS

(WEIGHT 2200 LBS)

Maximum altitude loss during a normal stall recovery is approximately 300 ft.

ANGLE OF BANK			
LEVEL	30°	45°	60°
FLAPS-UP			
67 mph 58 kts	72 mph 63 kts	81 mph 70 kts	99 mph 86 kts
FLAPS - DOWN (35°)			
55 mph 48 kts	60 mph 53 kts	67 mph 58 kts	82 mph 71 kts

(WEIGHT 2250 LBS)

Maximum altitude loss during a normal stall recovery is approximately 300 ft.

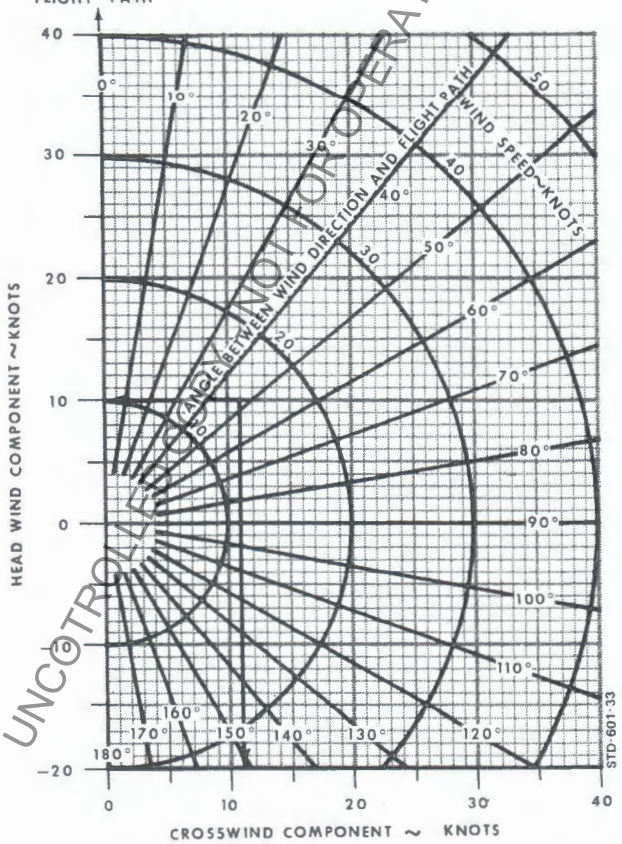
ANGLE OF BANK			
LEVEL	30°	45°	60°
FLAPS-UP			
68 mph 59 kts	74 mph 64 kts	83 mph 72 kts	101 mph 88 kts
FLAPS - DOWN (35°)			
56 mph 49 kts	62 mph 54 kts	68 mph 59 kts	84 mph 73 kts

WIND COMPONENTS

Demonstrated Crosswind is 13KTS/15MPH

EXAMPLE:

WIND SPEED	15 KTS
ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH	50°
HEADWIND COMPONENT	10 KTS
CROSSWIND COMPONENT	11 KTS



TAKE-OFF DISTANCE
2200 LBS

ASSOCIATED CONDITIONS

POWER	FULL THROTTLE
FLAPS	UP
RUNWAY	LEVEL, DRY, PAVED SURFACE
WEIGHT	2200 POUNDS

EXAMPLE

OAT	15°F
PRESSURE ALTITUDE	4000 FEET
HEADWIND	10 KNOTS
GROUND ROLL	959 FEET
TOTAL DISTANCE	1696 FEET

	Sea Level			2000 Ft.			4000 Ft.			6000 Ft.			8000 Ft.		
Wind Vel KTS	Oat F°	Grnd Run Ft.	To Clear 50′ Obst Ft.	Oat F°	Grnd Run Ft.	To Clear 50′ Obst Ft.	Oat F°	Grnd Run Ft.	To Clear 50′ Obst Ft.	Oat F°	Grnd Run Ft.	To Clear 50′ Obst Ft.	Oat F°	Grnd Run Ft.	To Clear 50′ Obst Ft.
-10	30	1133	1940	20	1276	2246	15	1499	2553	10	1713	3004	0	2024	3547
	59	1371	2412	52	1608	2706	45	1864	3142	38	2166	3689	30	2601	4257
	90	1703	2838	80	1987	3443	75	2317	3784	70	2744	4070	60	3180	5202
0	30	777	1392	20	902	1604	15	1052	1857	10	1235	2161	0	1461	2541
	59	984	1730	52	1147	2000	45	1344	2323	38	1581	2714	30	1878	3203
	90	1219	2104	80	1424	2439	75	1672	2843	70	1972	3331	60	2350	3943
10	30	703	1272	20	815	1464	15	959	1696	10	1114	1987	0	1328	2337
	59	895	1573	52	1045	1835	45	1227	2139	38	1449	2503	30	1715	2405
	90	1109	1929	80	1303	2238	75	1298	2609	70	1812	3072	60	2166	3628
30	30	556	1031	20	642	1183	15	770	1372	10	874	1637	0	1059	1930
	59	718	1258	52	841	1505	45	993	1769	38	1183	2081	30	1391	2412
	90	889	1580	80	1059	1836	75	1206	2147	70	1490	2553	60	1798	2999

NOTE: Minus sign indicates tailwind.

A23-19-KCI-1

TAKE-OFF DISTANCE
2250 LBS

ASSOCIATED CONDITIONS

POWER	FULL THROTTLE
FLAPS	UP
RUNWAY	LEVEL, DRY, PAVED SURFACE
WEIGHT	2250 POUNDS

EXAMPLE

OAT	15°F
PRESSURE ALTITUDE	4000 FEET
HEADWIND	10 KNOTS
GROUND ROLL	1014 FEET
TOTAL DISTANCE	1792 FEET

Sea Level				2000 Ft.			4000 Ft.			6000 Ft.			8000 Ft.		
Wind Vel KTS	Oat F°	Grnd Run Ft.	To Clear 50' Obst Ft.	Oat F°	Grnd Run Ft.	To Clear 50' Obst Ft.	Oat F°	Grnd Run Ft.	To Clear 50' Obst Ft.	Oat F°	Grnd Run Ft.	To Clear 50' Obst Ft.	Oat F°	Grnd Run Ft.	To Clear 50' Obst Ft.
-10	30	1200	2050	20	1350	2375	15	1585	2700	10	1810	3175	0	2140	3750
	59	1450	2550	52	1700	2860	45	1970	3320	38	2290	3900	30	2750	4500
	90	1800	3000	80	2100	3640	75	2450	4000	70	2900	4300	60	3360	5500
0	30	822	1471	20	954	1695	15	1113	1963	10	1305	2285	0	1544	2687
	59	1041	1828	52	1212	2114	45	1420	2456	38	1671	2869	30	1985	3386
	90	1288	2224	80	1505	2579	75	1767	3005	70	2085	3521	60	2485	4168
10	30	745	1344	20	836	1547	15	1014	1792	10	1178	2100	0	1403	2471
	59	947	1662	52	1105	1939	45	1297	2261	38	1531	2646	30	1813	3270
	90	1172	2039	80	1377	2366	75	1614	2760	70	1915	3247	60	2290	3835
30	30	590	1090	20	680	1250	15	815	1450	10	925	1730	0	1120	2040
	59	760	1330	52	890	1590	45	1050	1870	38	1250	2200	30	1470	2550
	90	940	1670	80	1120	1940	75	1275	2270	70	1575	2700	60	1900	3170

NOTE: Minus sign indicates tailwind.

19A-KCI-1

RATE-OF-CLIMB

ASSOCIATED CONDITIONS:

POWER	FULL THROTTLE
FLAPS	UP
MIXTURE	FULL RICH

EXAMPLE:

WEIGHT	2000 LBS
PRESSURE ALTITUDE	4000 FT
CLIMB SPEED	70/81 KTS/MPH
RATE-OF-CLIMB	708 FT/MIN

WEIGHT LBS	PRESSURE ALTITUDE FT	CLIMB SPEED KNOTS/MPH	RATE OF CLIMB~ FT/MIN
2250	SL	74/86	700
	4000	73/84	485
	8000	70/81	270
	12000	69/80	55
2200	SL	74/85	740
	4000	73/84	525
	8000	70/81	310
	12000	69/80	95
2000	SL	72/83	935
	4000	70/81	708
	8000	69/79	482
	12000	68/78	258
1800	SL	69/80	1167
	4000	70/81	925
	8000	69/79	685
	12000	66/76	448

19A-KCI-2

CRUISE PERFORMANCE
STANDARD DAY
38.8 GALLONS

ALT	RPM	%BHP	FUEL FLOW ~ GPH	TRUE AIRSPEED KTS/MPH	ENDURANCE HOURS	RANGE S. MILES
2500	2500	75	9.0	110/126	3.7	469
	2350	63	7.6	101/116	4.4	513
	2200	53	6.5	93/107	5.2	559
3500	2525	75	9.0	111/127	3.7	470
	2400	65	7.8	103/119	4.3	507
	2250	55	6.7	96/110	5.0	546
4500	2550	75	9.0	111/128	3.7	472
	2400	63	7.6	103/118	4.4	515
	2250	53	6.5	95/109	5.2	564
5500	2600	77	9.2	114/131	3.7	468
	2450	65	7.8	105/121	4.3	512
	2300	55	6.7	97/112	5.0	551
6500	2600	75	9.0	113/130	3.7	475
	2450	63	7.6	104/120	4.4	519
	2800	54	6.6	97/111	5.1	556
7500	2600	73	8.8	112/129	3.8	481
	2450	62	7.4	103/119	4.4	519
	2300	53	6.5	97/111	5.4	564
8500	2600	71	8.5	111/128	4.0	488
	2450	60	7.2	102/117	4.6	522
	2300	52	6.4	96/110	5.2	564
9500	2800	69	8.3	111/127	4.1	500
	2450	59	7.1	107/117	4.7	537
	2300	51	6.2	95/109	5.3	572
10500	2550	63	7.6	106/122	4.4	521
	2450	57	6.9	101/116	4.8	545
	2300	50	6.1	94/108	5.3	573

NOTE: Cruise performance is based on best power mixture. Lean to maximum RPM for best performance.

19A-KCI-3

CRUISE PERFORMANCE
STANDARD DAY
58.8 GALLONS

ALT	RPM	%BHP	FUEL FLOW ~ GPH	TRUE AIRSPEED KTS/MPH	ENDURANCE HOURS	RANGE S/MILES
2500	2500	75	9.0	110/126	6.0	749
	2350	63	7.6	101/116	7.1	818
	2200	53	6.5	93/107	8.4	894
3500	2525	75	9.0	111/127	6.0	751
	2400	65	7.8	103/119	6.9	813
	2250	55	6.7	96/110	8.0	874
4500	2550	75	9.0	111/128	6.0	756
	2400	63	7.6	103/118	7.0	827
	2250	53	6.5	95/109	9.3	905
5500	2600	77	9.2	114/131	5.8	752
	2450	65	7.8	105/121	6.8	823
	2300	55	6.7	97/112	8.0	887
6500	2600	75	9.0	113/130	5.9	763
	2450	63	7.6	104/120	54	836
	2800	54	6.6	97/111	8.1	897
7500	2600	73	8.8	112/129	6.1	775
	2450	62	7.4	103/119	7.1	838
	2300	53	6.5	97/111	8.3	910
8500	2600	71	8.5	111/128	6.3	789
	2450	60	7.2	102/117	7.3	845
	2300	52	6.4	96/110	8.4	913
9500	2800	69	8.3	111/127	6.5	806
	2450	59	7.1	107/117	7.5	866
	2300	51	6.2	95/109	8.5	923
10500	2550	63	7.6	106/122	6.7	843
	2450	57	6.9	101/116	7.7	882
	2300	50	6.1	94/108	8.6	928

19A-KCI-4

NOTE: Cruise performance is based on best power mixture. Lean to maximum RPM for best performance.

LANDING DISTANCE

ASSOCIATED CONDITIONS:

POWER	RETARDED TO MAINTAIN 500 FT/MIN ON FINAL APPROACH
FLAPS	100%
RUNWAY	PAVED, LEVEL, DRY SURFACE
BRAKING	MAXIMUM

EXAMPLE:

WEIGHT	2200 POUNDS
OUTSIDE AIR TEMPERATURE	10°C
PRESSURE ALTITUDE	4000 FEET
HEADWIND COMPONENT	10 KNOTS
GROUND ROLL	688 FT
TOTAL OVER 50 FT OBSTACLE	2160 FT
APPROACH SPEED	65 KNOTS/75 MPH

NOTE:
1. DECREASE DISTANCES 4% FOR EACH 5 KNOTS HEADWIND.
   FOR OPERATIONS WITH TAILWINDS UP TO 10 KNOTS, INCREASE DISTANCES BY 9% FOR EACH 2.5 KNOTS.

SPEED AT 50 FT KNOTS/ MPH	SPEED AT CONTACT KNOTS/ MPH	PRESS ALT FEET	0°C		10°C		20°C		30°C		40°	
			GROUND ROLL	TOTAL TO CLEAR 50 FT OBS	GROUND ROLL	TOTAL TO CLEAR 50 FT OBS	GROUND ROLL	TOTAL TO CLEAR 50 FT OBS	GROUND ROLL	TOTAL TO CLEAR 50 FT OBS	GROUND ROLL	TOTAL TO CLEAR 50 FT OBS
65/75	54/62	SL	543	1793	578	1892	613	1988	650	2088	694	2191
		2000	616	1995	656	2102	697	2213	741	2328	785	2447
		4000	701	2224	748	2348	796	2477	846	2610	898	2746
		6000	815	2493	856	2636	914	2786	972	2940	1033	3098
		8000	922	2809	986	2976	1053	3148	1121	3327	1193	3510
		10000	1066	3183	1141	3377	1219	3577	1299	3784	1380	3890

19A-KCI-5

INTENTIONALLY LEFT BLANK

SECTION VI

WEIGHT AND BALANCE/ EQUIPMENT LIST

TABLE OF CONTENTS

SUBJECT *PAGE*

Introduction to Weight and Balance 6-3
Weighing Instructions 6-4
Schematic 6-6
Sample - Basic EMPTY Weight and Balance Form 6-7
Weight and Balance Record 6-9
Weight and Balance Responsibilities 6-11
Gross Weight Moment Limits ..... 6-12 - 6-14
Computing Procedure 6-15
Sample Weight and Balance Loading Form .. 6-16
Weight and Balance Loading Form 6-17
Useful Load Weights and Moments 6-18
Occupants 6-18
Oil 6-19
Usable Fuel 6-19
Baggage 6-20
Equipment List ..... Provided for Each Airplane

INTENTIONALLY LEFT BLANK

INTRODUCTION TO WEIGHT AND BALANCE

The necessity for proper computation of the airplane's weight and balance cannot be overemphasized. In the basic design, it is planned that under normal loading the weight distribution of pilot, passengers, baggage, and fuel will balance the airplane for flight. Since these items are all variables, it is possible to concentrate weight in such a way as to make the airplane unsafe for flight. The factors which must be considered in the weight and balance of the airplane are the installation of equipment after the airplane has been weighed, trapped or unusable fuel, engine oil, usable fuel, pilot and passenger weights, and baggage or cargo.

In order to simplify the computation of the weight and balance, Beech Aircraft Corporation has devised a form called Basic Empty Weight and Balance. When the airplane is delivered from the factory it will first be weighed and the data recorded on this form. Provision has been made on the form for listing additions of items to be installed before the delivery or subtractions of items to be removed before delivery from the "as weighed" condition. This then represents the empty weight of the airplane.

When the airplane is first fueled, a certain amount of fuel is trapped in the fuel lines and cells which cannot be drained. Also, in some regimes of flight there are certain amounts of fuel that cannot be used. The combination of these fuel amounts is classified as unusable fuel. Also, it has been found that all operators bring the oil level near full before each flight. Thus, these items are computed along with the empty weight, giving a Basic Empty Weight as a starting point to the pilot for each flight computation.

Once the Basic Empty Weight for a given airplane has been established, the pilot is then only concerned with the

variable items which will comprise his useful load. These items which are of a changing nature are: Pilot and Passengers (computed on an individual weight and the seat occupied), Baggage and/or Cargo (computed on weight and location within the airplane), and Usable Fuel (the remaining fuel after subtracting the unusable fuel from the measured fuel on board).

WEIGHING INSTRUCTIONS

Periodic weighing of the airplane 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 operator.

1. Provision for jack points are provided for weighing: two on the wing front spar at Fuselage Station 129.4 and one on the aft fuselage at Fuselage Station 285.9 (tail tie-down ring).

2. Fuel should be drained preparatory to weighing. Tanks are drained from the regular drain ports with the airplane in static ground attitude. The unusable fuel to be added to a Basic Empty Weight is: 6 lbs at Fuselage Station 125.0. 45.6 lbs (airplanes after compliance with Service Instructions No. 0624-281) at Fuselage Station 125.0.

3. Engine oil must be at the full level or completely drained. Total engine oil when full is 15 pounds at Fuselage Station 48.

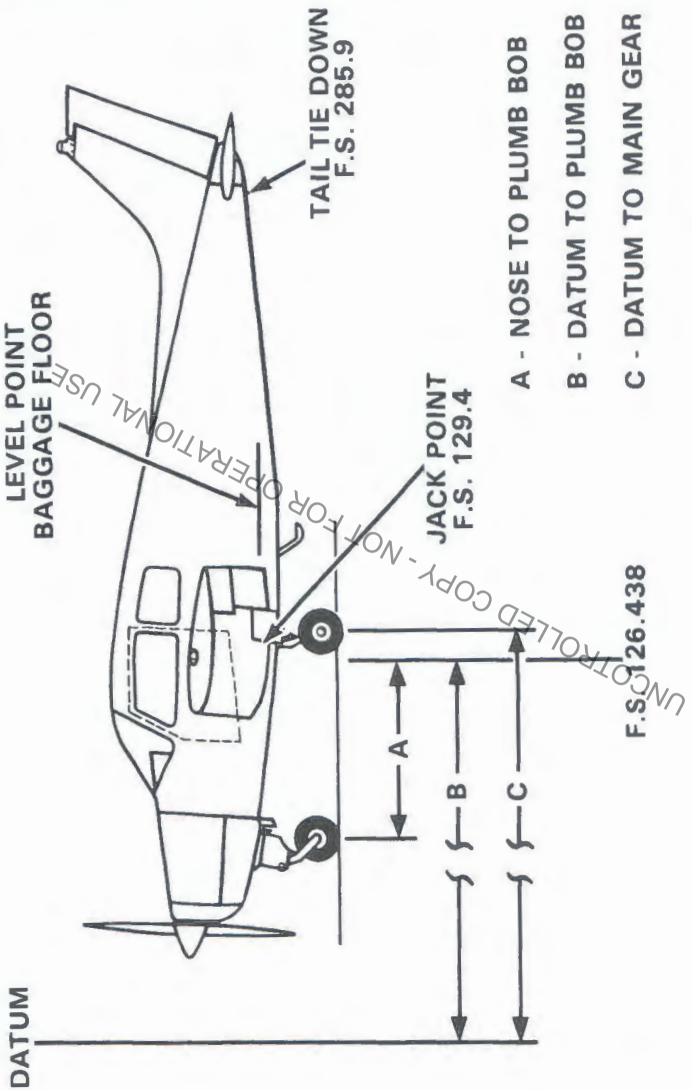
4. To determine airplane configuration at time of weighing, installed equipment is checked against the airplane equipment list or superseding forms. All installed equipment must be in its proper place during weighing.

5. At the time of weighing, the airplane must be level both longitudinally and laterally. Longitudinally and laterally level attitude is determined with a level on the baggage compartment floor.

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 centerline of airplane at F.S. 126.438, forward screw in spar access cover, approximately 8 to 10 inches forward of centerline drain hole) to the axle centerline of the main gear and then to the nose wheel axle centerline. The main wheel axle centerline 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 centerline. The locations of the wheel reactions will be approximately at Fuselage Station 129.5 for main wheels and Fuselage Station 57.6 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 129.4, 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

MODEL_____SER. NO._____REG. NO._____DATE_____

JACK POINT LOCATION
FORWARD 129.4
AFT

PREPARED BY
Company_____
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					
EMPTY WEIGHT (DRY)					
ENGINE OIL			15.0	48.0	720
UNUSABLE FUEL					
MB-1 thru MB-460			6.0	125.0	750
Airplanes after compliance with S.I. No. 0624-281			45.6	125.0	5700
BASIC EMPTY WEIGHT					

NOTE

Each new airplane is delivered with a completed sample loading, basic empty weight and center of gravity, and equipment list all pertinent to that specific airplane. It is the owner's responsibility to ensure that changes in equipment are reflected in a new weight and balance and in an addendum to the equipment list. There are many ways of doing this; it is suggested that a running tally of equipment changes and their effect on basic empty weight and c.g. is a suitable means for meeting both requirements.

The current equipment list and empty weight and c.g. information must be retained with the airplane when it changes ownership. Beech Aircraft Corporation cannot maintain this information; the current status is known only to the owner. If these papers become lost, the FAA will require that the airplane be re-weighed to establish the empty weight and c.g. and that an inventory of installed equipment be conducted to create a new equipment list.

It is recommended that duplicate copies of the Basic Empty Weight and Balance sheet and the Equipment List be made and kept in an alternate location in the event the original handbook is misplaced.

WEIGHT AND BALANCE RECORD

SERIAL NO. ____________ REGISTRATION NO. ____________ PAGE NO. 1

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

WEIGHT AND BALANCE RECORD

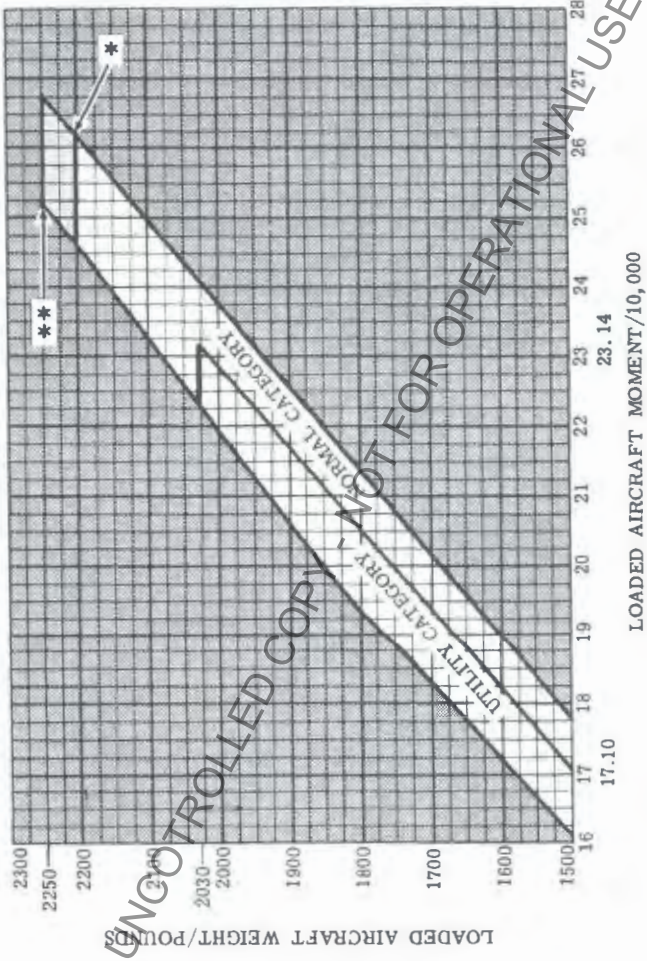
SERIAL NO. ____________ REGISTRATION NO. ____________ PAGE NO. 2

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

WEIGHT AND BALANCE RESPONSIBILITIES

The Basic Empty Weight and Moment of the airplane at the time of delivery are shown on the airplane Basic Empty Weight and Balance form. Useful load items which may be loaded into the airplane are shown on the Useful Load Weights and Moments tables. The minimum and maximum moments are shown on the Moment Limits vs Weight table and can also be plotted on the Moment Limits vs Weight graph as visual indication that the limit is within the operational envelope. These moments correspond to the forward and aft center-of-gravity flight limits for a particular weight. The airplane must be loaded in such a manner to keep the center-of-gravity within these limits.

GROSS WEIGHT MOMENT LIMITS



*A23-19
**19A, A23-19 when Beechcraft Kit 23-5003 is installed

GROSS WEIGHT MOMENT LIMITS (NORMAL CATEGORY)

Gross Wt	Min. Mom. / 100	Max. Mom. / 100	Gross Wt	Min. Mom. / 100	Max. Mom. / 100	Gross Wt	Min. Mom. / 100	Max. Mom. / 100
1500	1617	1775	1760	1897	2082	2020	2224	2390
1510	1628	1786	1770	1908	2094	2030	2237	2401
1520	1639	1798	1780	1919	2106	2040	2250	2413
1530	1649	1810	1790	1930	2118	2050	2263	2425
1540	1660	1822	1800	1940	2129	2060	2276	2437
1550	1671	1834	1810	1953	2141	2070	2289	2449
1560	1682	1845	1820	1966	2153	2080	2303	2461
1570	1692	1857	1830	1978	2165	2090	2316	2472
1580	1703	1869	1840	1991	2177	2100	2329	2484
1590	1714	1881	1850	2004	2189	2110	2342	2496
1600	1725	1893	1860	2016	2200	2120	2355	2508
1610	1736	1905	1870	2029	2212	2130	2369	2520
1620	1746	1916	1880	2042	2224	2140	2381	2532
1630	1757	1928	1890	2054	2236	2150	2395	2543
1640	1768	1940	1900	2067	2248	2160	2409	2555
1650	1779	1952	1910	2080	2260	2170	2423	2567
1660	1789	1964	1920	2092	2271	2180	2436	2579
1670	1800	1976	1930	2106	2283	2190	2450	2591
1680	1811	1987	1940	2118	2295	2200	2463	2603
1690	1822	1999	1950	2133	2307	2210	2477	2614
1700	1833	2011	1960	2144	2319	2220	2490	2626
1710	1843	2023	1970	2157	2331	2230	2504	2638
1720	1854	2035	1980	2172	2342	2240	2517	2650
1730	1865	2047	1990	2185	2354	2250	2531	2662
1740	1876	2058	2000	2198	2366			
1750	1887	2070	2010	2211	2378			

The above weight and moment limits are based on the following weight and center of gravity limit data:

NORMAL CATEGORY WEIGHT CONDITION	FWD CG LIMIT	AFT CG LIMIT
2250 lb. (max. take-off or landing) Models: 19A, A23-19 when Beechcraft Kit 23-5003 is installed.	112.5	118.3
2200 lb. (max. take-off or landing) Model: A23-19	112.0	118.3
1800 lb. or less	107.8	118.3

GROSS WEIGHT MOMENT LIMITS
(UTILITY CATEGORY)
(ACROBATIC CATEGORY - 19A)

Gross Wt	Min. Mom. / 100	Max. Mom. / 100	Gross Wt	Min. Mom. / 100	Max. Mom. / 100	Gross Wt	Min. Mom. / 100	Max. Mom. / 100
1500	1617	1710	1680	1811	1915	1860	2017	2120
1510	1628	1721	1690	1822	1927	1870	2029	2132
1520	1639	1733	1700	1833	1938	1880	2042	2143
1530	1649	1744	1710	1843	1949	1890	2055	2155
1540	1660	1756	1720	1854	1961	1900	2068	2166
1550	1671	1767	1730	1865	1972	1910	2081	2177
1560	1682	1778	1740	1876	1984	1920	2094	2189
1570	1692	1790	1750	1887	1995	1930	2107	2200
1580	1703	1801	1760	1897	2006	1940	2120	2212
1590	1714	1813	1770	1908	2018	1950	2133	2223
1600	1725	1824	1780	1919	2029	1960	2145	2234
1610	1736	1835	1790	1930	2041	1970	2158	2246
1620	1746	1847	1800	1940	2052	1980	2172	2257
1630	1757	1858	1810	1953	2063	1990	2185	2269
1640	1768	1870	1820	1966	2075	2000	2198	2280
1650	1779	1881	1830	1978	2086	2010	2211	2291
1660	1789	1892	1840	1991	2098	2020	2224	2303
1670	1800	1904	1850	2004	2109	2030	2237	2314

The above weight and moment limits are based on the following weight and center of gravity limit data:

UTILITY CATEGORY & ACROBATIC CATEGORY

WEIGHT CONDITION	FWD CG LIMIT	AFT CG LIMIT
2030 lbs (max. take-off or landing)	110.2	114.0
1800 lbs or less	107.8	114.0

COMPUTING PROCEDURE

1. Record the Basic Empty Weight and Moment from the Basic Empty Weight and Balance form (or from the latest superseding form) under the Basic Empty Condition block. The moment must be divided by 100 to correspond to Useful Load Weights and Moments tables.

2. Record the weight and corresponding moment from the appropriate table of each of the useful load items (except fuel) to be carried in the airplane.

3. Total the weight column and moment column. The SUB-TOTAL is the Zero Fuel Condition.

4. Determine the weight and corresponding moment for the fuel loading to be used. This fuel loading includes fuel for the flight, plus that required for start, taxi, and take-off. Add the Fuel to Zero Fuel Condition to obtain the SUB-TOTAL Ramp Condition.

5. Subtract the fuel to be used for start, taxi, and take-off to arrive at the SUB-TOTAL Take-off Condition.

6. Subtract the weight and moment of the fuel in the incremental sequence in which it is to be used from the take-off weight and moment. The Zero Fuel Condition, the Take-Off Condition, and the Landing Condition moment must be within the minimum and maximum moments shown on the Moment Limit vs Weight graph for that weight. If the total moment is less than the minimum moment allowed, useful load items must be shifted aft or forward load items reduced. If the total moment is greater than the maximum moment allowed, useful load items must be shifted forward or aft load items reduced. If the quantity or location of load items is changed, the calculations must be revised and the moments rechecked.

The following Sample Loading chart is presented to depict the sample method of computing a load. Weights used DO NOT reflect an actual airplane loading.

WEIGHT AND BALANCE LOADING FORM

MODEL_____ **DATE**_____

SERIAL NO. MB-XXX **REG NO.** NXXX

ITEM	WEIGHT	MOM/100
1. BASIC EMPTY CONDITION	1437	1594
2. FRONT SEAT OCCUPANTS	340	374
3. 3rd & 4th SEAT OCCUPANTS	140	199
4. BAGGAGE OR CARGO	45	64
5. **SUB TOTAL** ZERO FUEL CONDITION	1962	2231
6. FUEL LOADING (32 GAL)	192	225
7. **SUB TOTAL** RAMP CONDITION	2154	2456
8. *LESS FUEL FOR START, TAXI, AND TAKE-OFF	-5	-6
9. **SUB TOTAL** TAKE-OFF CONDITION	2149	2450
10. LESS FUEL TO DESTINATION (25 GAL)	-150	-176
11. **LANDING CONDITION**	1999	2284

*Fuel for start, taxi and take-off is normally 5 lbs at an average mom/100 of 6.

WEIGHT AND BALANCE LOADING FORM

MODEL _____ DATE _____

SERIAL NO. _____ REG NO. NXXX

ITEM	WEIGHT	MOM/100
1. BASIC EMPTY CONDITION		
2. FRONT SEAT OCCUPANTS		
3. 3rd & 4th SEAT OCCUPANTS		
4. BAGGAGE OR CARGO		
5. **SUB TOTAL ZERO FUEL CONDITION**		
6. FUEL LOADING (GAL)		
7. **SUB TOTAL** RAMP CONDITION		
8. *LESS FUEL FOR START, TAXI, AND TAKE-OFF		
9. **SUB TOTAL** TAKE-OFF CONDITION		
10. LESS FUEL TO DESTINATION (GAL)		
11. **LANDING CONDITION**		

*Fuel for start, taxi and take-off is normally 5 lbs at an average mom/100 of 6.

USEFUL LOAD WEIGHTS AND MOMENTS

OCCUPANTS

WEIGHT	*FRONT SEATS	3RD AND 4TH SEATS
		BENCH SEAT
	ARM **110	ARM **142
	MOM / 100	MOM / 100
120	132	170
130	143	185
140	154	199
150	165	213
160	176	227
170	187	241
180	198	256
190	209	270
200	220	284

*Reclining seat with back in full-up position.

**Values computed from a C.G. criterion based on a 170 pound male. Differences in physical characteristics can cause variation in center of gravity location.

USEFUL LOAD WEIGHTS AND MOMENTS

OIL

(Included in Basic Empty Weight)

ARM 48		
QUARTS	WEIGHT	MOMENT/100
8	15	7

USABLE FUEL

ARM 117		
GALLONS	WEIGHT	MOMENT/100
5	30	35
10	60	70
15	90	105
20	120	140
22	132	154
25	150	176
27	162	189
30	180	211
32	192	225
35	210	246
37	222	259
40	240	281
45	270	316
50	300	351
52	312	365
55	330	386
57	342	400
58	348	407

USEFUL LOAD WEIGHTS AND MOMENTS

BAGGAGE

ARM 142	
WEIGHT	MOMENT / 100
10	14
20	28
30	43
40	57
50	71
60	85
70	99
80	114
90	128
100	142
110	156
120	170
130	185
140	199

SECTION VII

SYSTEMS DESCRIPTION

TABLE OF CONTENTS

SUBJECT	*PAGE*
Airframe	7-5
Seating Arrangements	7-5
Flight Controls	
Control Surfaces	7-5
Control Column	7-5
Rudder Pedals	7-6
Stabilator Trim System	
Manual Trim	7-6
Electric Trim	7-6
Instrument Panel	7-6
Illustration	7-7
Switches	7-8
Circuit Breakers	7-8
Flight Instruments	7-8
Ground Control	7-8
Wing Flaps	
Manual	7-9
Electric	7-9
Landing Gear	7-10
Brakes	7-10
Baggage Compartment	7-11
Seats, Seat Belts, and Shoulder Harnesses	
Seat Adjustment	7-11
Seat Belts	7-12
Shoulder Harnesses	7-12

TABLE OF CONTENTS (Continued)

SUBJECT	PAGE
Doors and Exits	
Forward Cabin Door	7-12
Control Locks	7-13
Engine	7-14
Engine Controls	7-14
Engine Instruments	7-14
Engine Break-In Information	7-14
Lubrication System	7-15
Carburetor Heat	7-15
Starter	7-16
Propeller	7-16
Fuel System	7-16
Fuel Tanks	7-16
Fuel Drains	7-17
Fuel Quantity Indicators	7-17
Fuel Boost Pump	7-17
Engine Primer	7-18
Fuel Tank Selection	7-18
Fuel Required for Flight	7-18
Fuel System Schematic	7-19
Electrical System	7-20
Battery	7-20
Alternator	7-20
External Power Receptacle	7-22
Lighting Systems	
Interior Lighting	7-22
Exterior Lighting	7-23
Environmental Systems	
Cabin Heating	7-23
Environmental Schematic	7-24
Ventilation	7-25
Exhaust Vent	7-25

TABLE OF CONTENTS (Continued)

SUBJECT *PAGE*

Pitot and Static Systems
Pitot System 7-25
Pitot Heat (Optional) 7-25
Normal Static Air System 7-25
Emergency Static Air System (Optional) 7-26
Vacuum System 7-26
Stall Warning System 7-26

INTENTIONALLY LEFT BLANK

AIRFRAME

The BEECHCRAFT Musketeer Sport III is a two-to-four place, single-engine landplane with non-retractable landing gear and is powered by an Avco Lycoming four-cylinder, horizontally opposed engine with a fixed pitch propeller.

SEATING ARRANGEMENTS

The standard configuration is two adjustable front seats. An optional fixed-bench rear seat may be installed. To adjust either of the front seats, pull the release knob below the left forward seat corner (pull to the right, then up) and slide the seat forward or aft as desired. Make certain the seat is locked securely in place after adjustment. The backs of both individual seats can be placed in any of three positions. Outboard armrests for the front seats are provided.

FLIGHT CONTROLS

CONTROL SURFACES

The control surfaces are operated with conventional cable systems terminating in bellcranks.

CONTROL COLUMN

A single control column/wheel is installed as standard equipment on the left side. The optional control column/wheel may be installed on the right side.

RUDDER PEDALS

The standard installation provides pedals for rudder control on the left side only. The optional installation provides a set of rudder pedals on the right side.

STABILATOR TRIM SYSTEM

MANUAL TRIM

The manual stabilator trim is actuated by a handwheel located between the front seats. A stabilator tab position indicator is located adjacent to the trim control handwheel. Forward movement of the wheel trims the airplane's nose down, aft movement of the wheel trims the airplane's nose up.

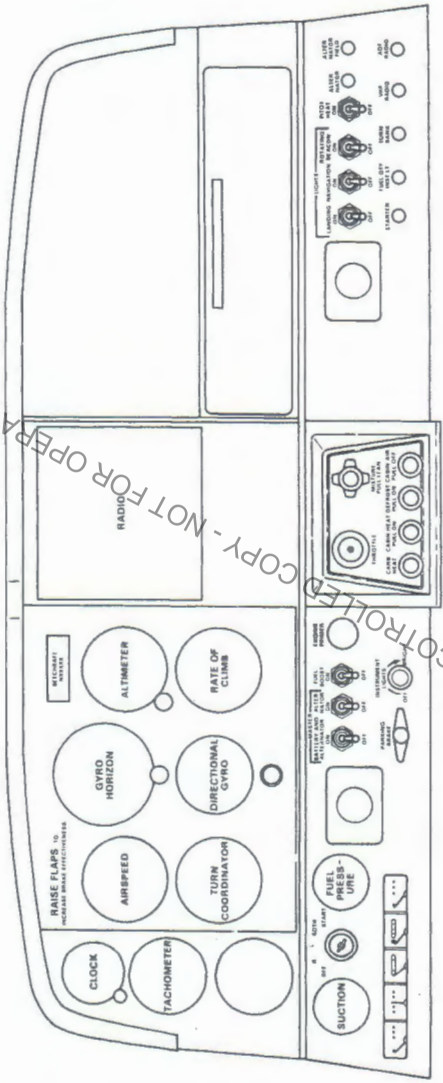
ELECTRIC TRIM (MB-289 thru MB-460)

The optional electric trim system is controlled by the ON-OFF switch located on the instrument panel, a thumb switch on the control wheel and a circuit breaker on the right subpanel. The ON-OFF switch must be on the ON position to operate the system. The thumb switch is moved forward for nose down, aft for nose up and when released, returns to the center OFF position. When the system is not being electrically actuated, the manual trim control wheel may be used.

INSTRUMENT PANEL

The standard instrument panel consists of flight and navigation instruments on the left, and an avionics section in the center. The switching panel and the engine gages are located on the left subpanel and the exterior light switches and circuit breaker grouping are on the right subpanel.

TYPICAL INSTRUMENT PANEL



SWITCHES

The BATTERY & ALT, ALT, FUEL BOOST and instrument light switches are grouped on the subpanel to the right of the pilot's control column. The magneto/start switch is to the left of the pilot's control column. The landing light, navigation lights, rotating beacon and pitot heat switches are located on the right subpanel to the right of the co-pilot's control column.

CIRCUIT BREAKERS

The circuit breakers are located on the right subpanel.

FLIGHT INSTRUMENTS

The standard flight instruments are grouped on the main panel for the best presentation for the pilot. The magnetic compass is located above the instrument panel.

Ram air pressure for the airspeed indicator enters through the pitot tube under the left wing, static air pressure for the altimeter, vertical speed and airspeed indicator is supplied by a static port on each side of the fuselage, just aft of the cabin.

Instrument lights are turned on and dimmed by a rheostat switch located on the left subpanel.

GROUND CONTROL

Steering is accomplished by the use of rudder pedals through a spring-loaded linkage connecting the nose gear to the rudder pedals. The nose gear maximum travel is 40° ± 2° right or left, and a hydraulic shimmy damper on the nose gear yoke compensates for any tendency to shimmy. Toe brakes may be used to aid in steering the airplane on the ground.

The minimum wing-tip turning radius, using full steering, one brake and partial power is 23 feet 11 inches.

WING FLAPS

MANUAL

The four position flaps are operated by a manual lever located between the front seats. In addition to the full flap down position of 35°, intermediate positions are provided. As the handle is raised to lower the flaps, a definite detent and click of the thumb release button will be felt at the 15° and 25° flap extended positions. Another detent will indicate the 35° position. To retract the flaps, depress the thumb button and lower the handle to the floor. The thumb button does not need to be depressed, nor should it be, to lower the flaps.

ELECTRIC (MB-452 thru MB-460)

The electric wing flaps are controlled by a three-position switch UP, OFF and DOWN, located to the right of the power quadrant. The switch must be pulled out of detent before it can be repositioned. A dial type indicator has markings for UP, 10 DEGREES, 20 DEGREES and DOWN. The indicator is located adjacent to the power quadrant.

Limit switches automatically turn off the electrical motor when the flaps reach the extremes of travel. Intermediate flap positions can be obtained by placing the three-position switch in the OFF position during flap extension or retraction.

CAUTION

Establish recovery altitude, recovery power, and airspeed before retracting flaps during slow flight, particularly during recoveries from approach configuration.

LANDING GEAR

The fixed tricycle landing gear, fabricated from magnesium castings and aluminum forgings, uses rubber disks for shock absorption.

The gears are identical except for the pivoting and steering provisions on the nose gear and the brake attachment points on the main gear.

The nose wheel is steerable through a spring loaded linkage connected to the rudder pedals and has a maximum travel of 40° ± 2° in either direction. A hydraulic damper on the nose wheel strut compensates for any tendency to shimmy. Toe brakes will aid in steering the airplane on the ground.

BRAKES
(MB-1 thru MB-264)

The brakes on the main landing gear wheels are operated by applying toe pressure to the rudder pedals. The parking brake push-pull control is located on the right side of the lower left subpanel. To set the parking brakes, depress the pilot's toe pedals until firm and pull out on the parking brake knob, then release the toe pressure. Release the parking brake by depressing the pilot's toe pedals, then push in the parking brake knob. Check both wheels for free roll before applying take-off power.

(MB-265 thru MB-460 and airplanes in compliance with BEECHCRAFT SERVICE LETTER 67-12)

The brakes on the main landing gear wheels are operated by applying toe pressure to the rudder pedals. The parking brake push-pull control is located on the right side of the lower left subpanel. To set the parking brakes, pull the control out and depress the pilot's toe pedals until firm. Push the control in to release the brakes.

NOTE

Wheel chocks should be installed and the parking brake left off if the airplane is to be left unattended. Changes in ambient temperature can cause the brakes to release or to exert excessive pressures.

BAGGAGE COMPARTMENT

A 28.5 cubic-foot baggage space is located aft of the two front seats when the family seat is not installed. In addition a hat shelf, near the top of the cabin enclosure provides an out-of-the-way space for light miscellaneous articles. Both the baggage compartment and hat shelf are accessible in flight.

WARNING

Do not carry hazardous material anywhere in the airplane.

Do not carry children in the baggage compartment.

SEATS, SEAT BELTS, AND SHOULDER HARNESSES

SEAT ADJUSTMENTS

To adjust either of the front seats pull up on the release knob below the left hand seat corner and slide the seat forward or aft, as desired. Make certain the seat is locked securely in place after adjustment. The backs of both individual seats can be placed in any of three positions. Outboard armrests for the front seats are provided.

SEAT BELTS

All seats are provided with seat belts having a lever-action, quick-release, metal buckle. The seat belt length is adjustable. Holding the buckle at a right angle to the belt releases the binding action, allowing the belt to slip.

SHOULDER HARNESS INSTALLATION

The shoulder harness installation is available for the pilot seats only. The belt is in the "Y" configuration with the single strap being contained in an inertia reel attached to the overhead canopy structure of the cockpit. The two straps are worn with one strap over each shoulder and fastened by metal loops into the seat belt buckle. The harness should be used with the seats in the upright position. The spring loading at the inertia reel keeps the harness snug but will allow normal movement required during flight operations. The inertia reel is designed with a locking device that will secure the harness in the event of sudden forward movement or an impact action.

DOORS AND EXITS

FORWARD CABIN DOORS

The airplane has a conventional cabin door on the right side (an optional left hand door was available) of the fuselage adjacent to the forward seats. The outside cabin door handle is spring-loaded to fit into a recess in the door. 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, grasp

the armrest attached to the door and firmly pull the door closed. Opening the storm window will alleviate pressure inside the cabin as the door is being closed. Press firmly outward at the aft edge 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, lift the door release handle and pull until the door latch releases.

CONTROL LOCKS

A control lock is provided with the loose tools, to prevent movement of the control column and impairs access to the magneto/start switch.

To install the Control Lock:

1. Level the control wheel and move control column so the holes in the control column hanger and control column will align to accept the pin.

2. Push the control column lock pin through the hole provided in the control column hanger and into the hole in the underside of the control column tube assembly.

3. Ensure positive retention of the lock pin by positioning the hook over the control column.

WARNING

Before starting engine, remove the control lock by reversing the above procedure.

ENGINE

The BEECHCRAFT Musketeer Sport III is powered by a Lycoming O-320-E2B, O-320-E2C or O-320-E3D four-cylinder, horizontally opposed engine, rated at 150 horsepower at 2700 rpm.

Normal operating engine speed range is 1800 to 2700 rpm.

ENGINE CONTROLS

The engine controls are centrally located for ease of operation from either the left or right seats. The throttle on the control console incorporates both a locking button and a vernier arrangement for fine adjustments. The mixture control is locked with a clockwise turn of the friction nut located on the forward side of the knob.

ENGINE INSTRUMENTS

The engine instrument cluster is located on the lower left subpanel and includes the left fuel quantity indicator, an ammeter, oil temperature, oil pressure and the right fuel quantity indicator. The tachometer is located on the upper left of the instrument panel. The fuel pressure indicator is located on the left subpanel.

ENGINE BREAK-IN INFORMATION

New engines have been carefully run-in by the engine manufacturer. However, the engine should be operated on straight mineral oil for a minimum of 50 hours or until oil consumption stabilizes. After the first 25 hours of operation, drain and replace the mineral oil. A change to an approved engine oil should be made after the break-in period. Refer to Lycoming Engine Operator's Manual.

NOTE

In order to promote proper ring seating, cruise power settings of 65% to 75% should be used until a total of 50 hours has accumulated or until oil consumption has stabilized. This recommendation is applicable to in-service engines following cylinder replacement or top-overhaul of one or more cylinders, as well as to new engines.

LUBRICATION SYSTEM

The engine oil system is the wet-sump type and has an 8-quart capacity. 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.

CARBURETOR HEAT

There is a possibility of ice forming in the induction system under certain moist atmospheric conditions. Generally ice may form in the vicinity of the carburetor butterfly and may build up enough that a drop in power output could result. The induction installation is equipped with a system for preheating the incoming air to the carburetor. The air preheater is essentially a tube or jacket through which the exhaust pipe from one or more cylinders is passed, and the air flowing over these surfaces is heated. A push-pull control located on the control console actuates a diverter gate which allows the hot air to mix with the cold air in the induction chamber before it enters the carburetor. For further information concerning the use of carburetor heat consult engine manufacturer's operating manual.

STARTER

The starter is relay-controlled and is actuated by a rotary type, momentary-on switch incorporated in the Magneto/Start switch. The magneto/start switch, located on the subpanel to the left of the pilot's control column, incorporates R (right), L (left), and BOTH magneto positions in addition to the normal OFF and START positions. After activation of the starter, the spring loaded switch returns to the BOTH position when released.

PROPELLER

Sensenich M74DM-O-58 or 74DM6-O-58 fixed-pitch, two-blade propeller. Static rpm at maximum permissible throttle settings: Not over 2400 rpm and not under 2300 rpm. No additional tolerance permitted. Diameter 74 inches, no cutoff permitted.

FUEL SYSTEM

The airplane is designed for operation on 80/87 (Red) grade aviation gasoline. In the event this grade is not available, 100LL (Blue) or 100 (Green) grade aviation gasolines may be used.

CAUTION

See Avco Lycoming Service Letter No. L185A or later revision for operation on alternate fuels.

FUEL TANKS

Fuel tanks located in each wing leading edge have a nominal capacity of 29.9 gallons. In the filler neck of each tank is a visual measuring tab which permits partial filling of

the fuel system. When the fuel touches the bottom of the tab it indicates 15 gallons of fuel, and when filled to the slot in the tab it indicates 20 gallons of fuel. The indicating system reads full at 20 gallons. The pilot must visually check the fuel level during preflight to ascertain desired level. Fuel is fed from the desired tank through a fuel selector valve in the center floorboard and then through a strainer to the engine-driven fuel pump.

FUEL DRAINS

Two tank sump drains extend through the bottom of the wing skins, near the fuselage. The system low spot drain is incorporated in the fuel strainer on the lower right side of the fuselage aft of the nose wheel. Sump drains provide a means to visually inspect the fuel for water or contaminants.

Refer to HANDLING, SERVICING AND MAINTENANCE Section for procedures describing how and when to use fuel tank sump drains.

FUEL QUANTITY INDICATORS

Fuel quantity is measured by a float operated sensor, located in each wing tank system. These transmit electrical signals that indicate fuel remaining in each tank. The indicators indicate full when 20 or more gallons are in each wing tank.

FUEL BOOST PUMP

The electric fuel boost pump is controlled by an ON-OFF switch on the pilot's subpanel. It provides pressure for starting, taxiing, takeoff, climb, landing and emergency operation in cruise configuration. Immediately after starting the fuel boost pump should be turned off to test the engine driven fuel pump.

ENGINE PRIMER

The control for the engine primer is located on the left sub-panel. It is used to inject raw fuel into the induction system for cold starts. After use, secure the primer by turning it to lock it in the off position.

FUEL TANK SELECTION

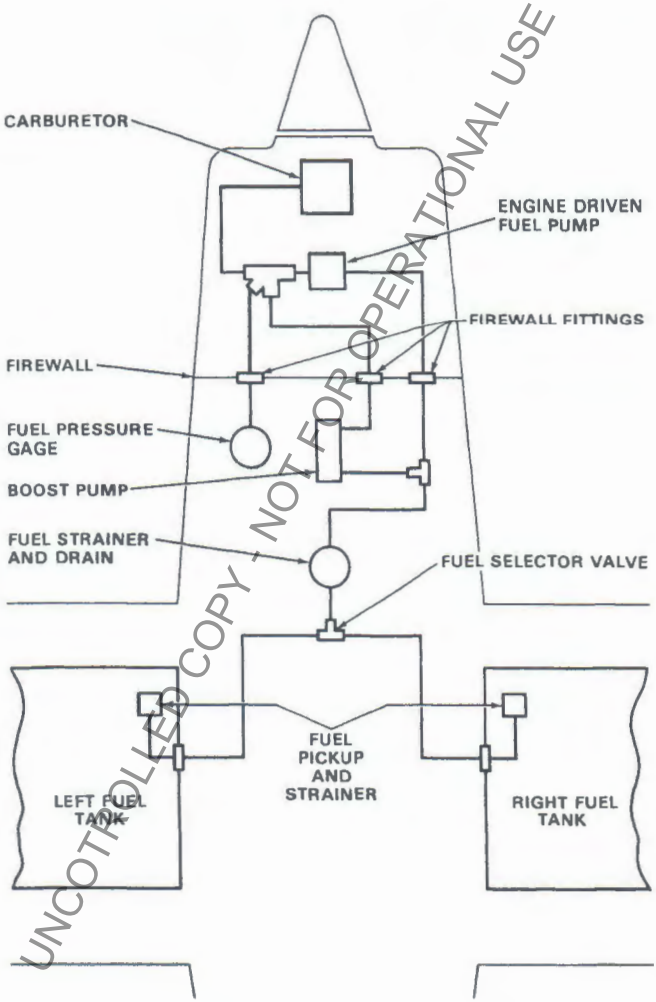
The fuel selector valve handle is located on the floorboards between the pilot and copilot seats. Takeoffs and landings should be made using the tank that is more nearly full.

If the engine stops because of insufficient fuel, refer to the EMERGENCY PROCEDURES Section for the Air Start procedures.

FUEL REQUIRED FOR FLIGHT

It is the pilot's responsibility to ascertain that the fuel quantity indicators are 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 indicators do not indicate above the *yellow arc or with less than 11 gallons in each main tank. 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. Fuel should be added so that the amount of fuel will be not less than is required for takeoff. Plan for an ample margin of fuel for any flight.

*Only on airplanes complying with BEECHCRAFT S.I. No. 0624-281.



FUEL SYSTEM SCHEMATIC

ELECTRICAL SYSTEM

The system circuitry is the single-wire, ground-return type, with the airplane structure used as the ground return. The BATTERY & ALT, ALT, FUEL BOOST, and magneto/start switches are located on the left subpanel. The circuit breaker panel, located on the right subpanel, contains the protective circuit-breakers for the various electrical systems. Some switch-type circuit breakers are located on the left subpanel.

BATTERY

A 12-volt battery is located in the aft fuselage. Battery servicing procedures are described in the HANDLING, SERVICING AND MAINTENANCE Section.

ALTERNATOR

The alternator maintains its full-rated output at cruise engine rpm, and uses a voltage regulator to adjust alternator output.

Dual switches are required to activate the alternator circuit. The switch placarded BATTERY & ALT, when placed in the ON position, will only activate the battery circuit. When this switch is on and the ALT switch is placed in the ON position, the alternator is excited by power from the airplane battery. When the BATTERY & ALT switch is in the OFF position, the alternator will be off regardless of the ALT switch position.

The alternator-field circuit breaker and alternator-output circuit breaker are located on the right subpanel.

CAUTION

Do not pull alternator circuit breaker to turn off electrical system except in an emergency.

The alternator output is controlled by a regulator to keep the battery in a fully charged condition. Monitoring the ammeter for proper operation of the alternator is the same as for a generator installation. A zero reading, which is normal in cruising flight, indicates that the battery is fully charged and that the alternator output has been adjusted by the voltage regulator to balance the load of the electrical equipment in use.

Should an alternator or regulator become inoperative, indicated by a heavy discharging or widely fluctuating ammeter indication, turn the ALT switch to OFF, and minimize the electrical current consumption, since only battery power is available. Have the difficulty corrected before the next flight.

Refer to HANDLING, SERVICING AND MAINTENANCE Section for minor maintenance of the alternator.

EXTERNAL POWER RECEPTACLE

The external power receptacle is optional on this airplane. If installed, it is located on the right side of the fuselage aft of the wing. This airplane requires a 14V, DC, negative ground power unit.

CAUTION

The power pin for external power is connected directly to the battery and continually energized. Battery and alternator switches and all electrical and avionics switches must be OFF when connecting the ground power plug. Care should be taken to assure correct polarity (negative ground), prior to connecting and energizing the ground power unit. The battery switch must be turned ON to connect the ground power unit to the airplane bus. Alternator switch must be OFF while using external power.

LIGHTING SYSTEMS

INTERIOR LIGHTING

Lighting for the instrument panel is controlled by a rheostat switch located on the pilot's subpanel to the right of the control column. The cabin dome light is operated by an ON-OFF switch adjacent to the light.

EXTERIOR LIGHTING

The switches for all of the exterior lights are located on the pilot's right subpanel. Each circuit is protected by a circuit breaker switch, circuit breaker, or fuse. The exterior lights consist of navigation lights on the wing tips and rudder, a landing light on the left outboard wing and a rotating beacon. The landing light can be used for approach and taxiing. For longer battery and lamp life, use the landing light sparingly; avoid prolonged operation which could cause overheating during ground maneuvering.

NOTE

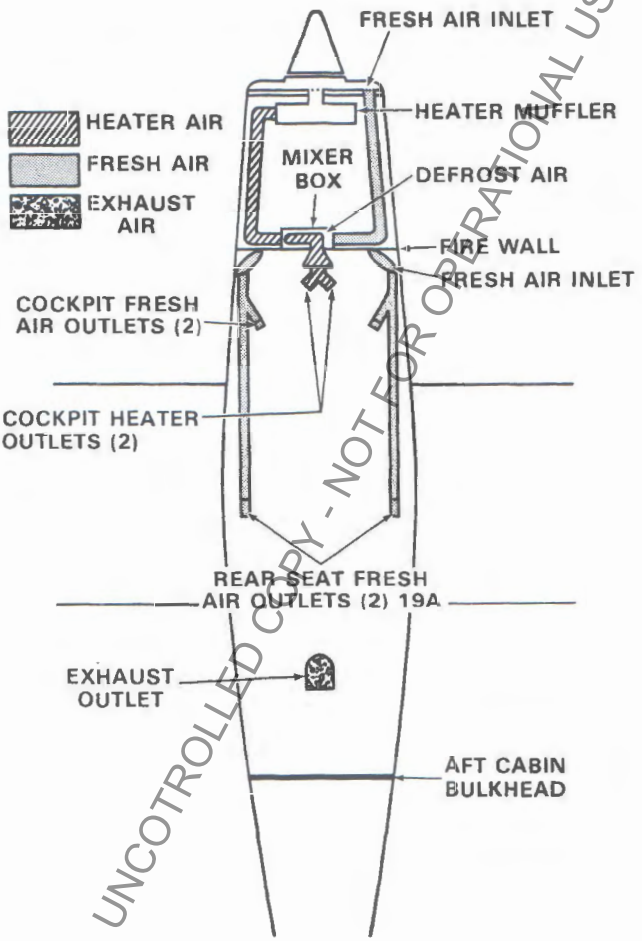
Particularly at night, reflections from rotating anti-collision lights or strobe lights on clouds, dense haze or dust can produce optical illusions and intense vertigo. Such lights, when installed, should be turned off before entering an overcast; their use may not be advisable under instrument or limited VFR conditions.

ENVIRONMENTAL SYSTEMS

CABIN HEATING

Air for warming the cabin and defrosting the windshield enters through an intake on the lower cowl forward bulkhead and passes through the heater and into a mixer box where it is blended with cold air to obtain the desired cabin temperature. Hot or cold air may enter the cabin through the firewall outlets. The knob marked CABIN AIR regulates the quantity of air entering the cabin through this firewall outlet. With the CABIN AIR knob in, pull out the CABIN HEAT knob for heated air and push it in for fresh air. There are 2 outlets for cabin heat distribution. Pull out the DEFROST knob for maximum defrost. Under extremely cold conditions, heating in the back seats can be improved by partially pulling the defrost knob.

ENVIRONMENTAL SCHEMATIC



VENTILATION

Fresh air for the cabin enters two grill type intakes immediately forward of the windshield. The air is ducted to two outlets, one on either side of the instrument panel. The flow of air is controlled by the rotation of these outlets.

EXHAUST VENT

An adjustable exhaust vent is located in the aft cabin for flow-through ventilation.

PITOT AND STATIC SYSTEMS

PITOT SYSTEM

The pitot system provides a source of impact air for operation of the airspeed indicator. The pitot mast is located on the leading edge of the left wing.

PITOT HEAT (OPTIONAL)

The pitot mast is provided with an electric heating element which is turned on and off with a switch on the instrument panel. The switch should be ON when flying in visible moisture. It is not advisable to operate the pitot heating element on the ground except for testing or for short intervals of time to remove ice or snow.

NORMAL STATIC AIR SYSTEM

The normal static air system provides a source of static air to the flight instruments through a flush static fitting on each side of the aft fuselage. A union located inside a cover plate on the belly of the airplane provides a drain point to remove moisture from the system.

EMERGENCY STATIC AIR SYSTEM (OPTIONAL)

An alternate (emergency) static air source may be installed to provide air for instrument operation should the normal static ports become blocked. The alternate source is installed on the pilot's lower left sidewall. Turning the red handle to the ON EMERGENCY position allows cabin air into the system. Refer to EMERGENCY PROCEDURES section for proper use of the system. For Airspeed Calibration and Altimeter Correction, refer to PERFORMANCE section.

VACUUM SYSTEM

Vacuum for air-driven gyroscopic flight instruments and other air-driven equipment is supplied by an engine-driven vacuum pump. An adjustable relief valve controls suction by bleeding outside air into the vacuum pump.

A suction gage indicates system vacuum in inches of mercury. This instrument is located on the pilot's side of the instrument panel. The vacuum should be maintained within the green arc for proper operation of the air-driven instruments.

STALL WARNING SYSTEM

A stall warning horn located in the overhead speaker console is factory set to sound a warning 5 to 7 mph above a stall condition and continues steadily as the airplane approaches a complete stall. The stall warning horn, triggered by a sensing vane on the leading edge of the left wing, is equally effective in all flight configurations and at all weights.

NOTE

With the BATTERY & ALT switch in the OFF position the stall warning horn is inoperative. Airplane certification requires the stall warning system to be on during flight except in emergency conditions as stated in Section III.

INTENTIONALLY LEFT BLANK

SECTION VIII

HANDLING, SERVICING AND MAINTENANCE

TABLE OF CONTENTS

SUBJECT	*PAGE*
Introduction	8-3
Publications	8-4
Airplane Inspection Periods	8-4
Preventative Maintenance that may be Accomplished by a Certificated Pilot	8-5
Alterations or Repairs to Airplane	8-5
Ground Handling	8-6
Towing	8-6
Parking	8-7
Control Column Lock Pin	8-7
Tie-Down	8-8
Jacking	8-8
Flyable Storage - 7 to 30 Days	
Mooring	8-9
Fuel Cells	8-9
Flight Control Surfaces	8-9
Grounding	8-9
Pitot Tube	8-9
Windshield and Windows	8-9
During Flyable Storage	8-9
Preparation for Service	8-10
Prolonged Out of Service Care	8-10
External Power	8-11
Checking Electrical Equipment	8-11

TABLE OF CONTENTS (Continued)

SUBJECT	PAGE
Servicing	
Fuel System	8-12
Fuel Tanks	8-12
Fuel Drains	8-13
Oil System	8-14
Recommended Oil Grades for Engines	8-14
Battery	8-14
Tires	8-15
Shimmy Damper	8-15
Brakes	8-16
Induction Air Filter	8-16
Vacuum System	8-17
Propeller Blades	8-17
Minor Maintenance	
Rubber Seals	8-18
Alternator	8-18
Magnetos	8-19
Cleaning	
Exterior Painted Surfaces	8-19
Windshields and Windows	8-20
Interior	8-21
Engine	8-22
Lubrication	8-22
Lubrication Points	8-23
Recommended Servicing Schedule	8-29
Consumable Materials	8-34
Approved Engine Oils	8-36
Bulb Replacement Guide	8-38
Overhaul or Replacement Schedule	8-39-8-43
Inspections	8-43
Operational Inspection	8-44
Power Plant	8-44
Cabin and Aft Fuselage	8-45
Exterior	8-45

INTRODUCTION

The purpose of this section is to outline the requirements for maintaining the airplane in a condition equal to that of its original manufacture. This information sets the time frequency intervals at which the airplane should be taken to a BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer for periodic servicing or preventive maintenance.

The Federal Aviation Regulations place the responsibility for the maintenance of this airplane on the owner and operator of the airplane 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.

Authorized BEECHCRAFT Aero or Aviation Centers and International Distributors or Dealers will have recommended modification, service, and operating procedures issued by both FAA and Beech Aircraft Corporation, designed to get maximum utility and safety from the airplane.

If a question should arise concerning the care of the airplane, it should be directed to Beech Aircraft Corporation, Liberal Division, Box 300, Liberal, Kansas 67901. Correspondence should contain the airplane serial number, which may be found on the manufacturer's placard located on the left aft section of the fuselage on serials MB-1 thru MB-264. The placard is attached to the right side of the fuselage behind the flap on serials MB-265 thru MB-460.

PUBLICATIONS

The following publications are available through BEECHCRAFT Aero or Aviation Centers and International Distributors or Dealers:

1. Shop Manual
2. Parts Catalog
3. Service Instructions
4. Various Inspection Forms

NOTE

Neither Service Publications, Reissues, nor Revisions are automatically provided to the holder of this handbook. For information on how to obtain "Revision Service" applicable to this handbook, consult any BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer or refer to the latest revision of BEECHCRAFT Service Instructions No. 0250-010.

AIRPLANE INSPECTION PERIODS

1. FAA Required Annual Inspections.
2. BEECHCRAFT Recommended Inspection Guide.
3. Continuing Care Inspection Guide.
4. See "Recommended Servicing Schedule" and "Overhaul or Replacement Schedule" for further inspection schedules.

PREVENTATIVE MAINTENANCE THAT MAY BE ACCOMPLISHED BY A CERTIFICATED PILOT

1. A certificated pilot may perform limited maintenance. Refer to FAR Part 43 for the items which may be accomplished.

   To ensure proper procedures are followed, obtain a BEECHCRAFT Shop Manual for 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 AIRPLANE

The FAA should be contacted prior to any alterations on the airplane to ensure the airworthiness of the airplane is not violated.

NOTE

Alterations and repairs to the airplane must be made by properly licensed personnel.

GROUND HANDLING

The three-view drawing shows the minimum hangar clearances for a standard airplane. Allowances must be made for any special radio antennas and the possibility of an underinflated nose tire.

TOWING

CAUTION

Extreme care should be used when moving with power equipment. Should the nose gear be turned in excess of the red limit marks, there is a very good possibility the nose gear steering yoke and/or linkage may be damaged.

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 stabilator to raise the nose wheel. Do not attempt to tow the airplane backward by the tail tie-down ring.

PARKING

MB-1 thru MB-264

The parking brake push-pull control is located on the right side of the pilot's lower subpanel. To set the parking brakes, depress the pilot's toe pedals until firm and pull out on the parking brake control, then release the toe pressure.

Release the parking brake by depressing the pilot's pedals with a hard, fast motion, then release the pressure slowly and check both wheels for free roll before applying take-off power.

MB-265 thru MB-460

The parking brake push-pull control is located on the right side of the pilot's lower subpanel. To set the parking brakes, pull out on the parking brake control and depress the pilot's toe pedals until firm.

Release the parking brake by pushing the parking brake control forward. Check both wheels for free roll before applying take-off power.

NOTE

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 brakes to release or to exert excessive pressures.

CONTROL COLUMN LOCK PIN

1. Level the control wheel and move control column so the holes in the control column hanger and the control column will align to accept the pin.

2. Push the control column lock pin through the hole provided in the control column hanger and into the hole in the underside of the control column tube assembly.

3. Ensure positive retention of the lock pin by positioning the hook over the control column.

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 column lock pin.
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 OVER TIGHTEN; 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 may be installed at the rear tie-down lug, and a tie-down line attached to the nose gear.

JACKING

Raise the individual gear for wheel and tire removal with a scissors jack under the axle. Refer to the BEECHCRAFT Shop Manual for proper procedures.

DO NOT enter the airplane while the airplane is on a wheel jack.

FLYABLE STORAGE - 7 TO 30 DAYS

MOORING

If the airplane cannot be placed in a hanger, tie down securely at the three points provided. Do not use hemp or manila rope. It is recommended a tail support be used to lightly compress the nose gear and reduce the angle of attack of the wings. Attach a line to the nose gear for additional tie-down.

FUEL CELLS

Fill to capacity to minimize fuel vapor.

FLIGHT CONTROL SURFACES

Lock with internal locks.

GROUNDING

Static ground airplane securely and effectively.

PITOT TUBE

Install cover.

WINDSHIELD AND WINDOWS

Close window vent.

DURING FLYABLE STORAGE

In a favorable atmospheric environment the engine of an aircraft that is flown intermittently can be adequately protected from corrosion by turning the engine over five revolutions by means of the propeller. This will dispel any beads of moisture that may have accummulated and spread the residual lubricating oil around the cylinder walls. Unless the aircraft is flown, repeat this procedure every five days.

WARNING

Be sure the ignition switch is "OFF", the throttle closed, and mixture control in the idle cut-off position before turning the propeller. Do not stand in the path of propeller blades. Also, ground running the engine for brief periods of time is not a substitute for turning the engine over by hand; in fact, the practice of ground running will tend to aggravate rather than minimize corrosion formation in the engine.

After 30 days, the aircraft should be flown for 30 minutes or a ground runup should be made long enough to produce an oil temperature within the lower green arc range. Excessive ground runup should be avoided.

PREPARATION FOR SERVICE

Remove all covers, clean the airplane, and give it a thorough inspection, particularly flaps and control openings.

Preflight the airplane.

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.

If the airplane is to be stored longer than 30 days refer to the appropriate airplane shop manual and Avco Lycoming Service Letter L180 or subsequent.

EXTERNAL POWER

When using external power, it is very important that the following precautions be observed:

1. 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.

2. To prevent arcing, make certain no power is being supplied when the connection is made.

3. Make certain that the BATT & ALT switch is ON, the ALT switch and all avionics and electrical switches OFF, and a battery is in the system before connecting an external power unit. This protects the voltage regulators and associated electrical equipment from transients (power fluctuations).

CHECKING ELECTRICAL EQUIPMENT

Connect an auxiliary power unit as outlined above. Ensure that the current is stabilized prior to making any electrical equipment or avionics check.

CAUTION

If the auxiliary power unit has poor voltage regulation or produces voltage transients the equipment connected to the unit may be damaged.

SERVICING

FUEL SYSTEM

FUEL TANKS

See Consumable Materials for recommended fuel grades.

CAUTION

See Avco Lycoming Service Letter No. L185A or later revision for operation on alternate fuels.

Two 29.9 gallon fuel tanks are located in the wings just outboard of the wing root. A visual measuring tab located below the tank filler neck facilitates a fuel load of 15 gallons when the fuel reaches the bottom of the tab, or 20 gallons when the fuel reaches the top of the slot. This partial filling of the fuel tanks allows an increase in the payload. The fuel indicators on the instrument panel will indicate full tanks even though each tank contains only 20 gallons of fuel.

CAUTION

Connect a grounding cable from the fuel service unit to the airframe, and connect grounding cables from both the fuel service unit and the airplane to ground during fueling operations. This procedure reduces fire hazard.

FUEL DRAINS

Open each of the fuel drain valves daily to remove any condensation from the system. The two tank sump drains extend through the bottom of the wing skins, near the fuselage.

The system low spot drain is incorporated in the fuel strainer on the lower right side of the fuselage aft of the nose wheel.

Inspection and cleaning of the fuel strainers should be considered of the utmost importance as a regular part of preventive maintenance. The following inspection and cleaning intervals are recommendations only, since the frequency will depend upon service conditions and fuel handling cleanliness. When operating in localities where there is an excessive amount of sand or dirt, the strainers should be inspected at more frequent intervals.

The screen in the fuel strainer at the system low spot on the bottom of the fuselage should be removed and washed in fresh cleaning solvent at each 100-hour inspection of the airplane. Ordinarily, the finger strainers in the fuel tank outlets should not require cleaning unless there is a definite indication of solid foreign material in the tanks, or the airplane has been stored for an extended period.

After the fuel strainers have been reinstalled, the installations should be checked for leakage. Any fuel lines or fittings disconnected for maintenance purposes should be capped.

Frequently inspect the O-rings on the fuel filler caps for condition. Replace as required to prevent contamination of the fuel from precipitation.

OIL SYSTEM

CAUTION

During break-in periods on new engines, oil consumption tends to be higher, therefore, maximum range flights should be avoided and oil level brought to full after each flight during this period.

Check engine oil quantity before each flight. Under normal operating conditions, the oil should be changed after each 50 hours of engine operation. More frequent changes may be required under adverse operating conditions. Use engine oil as indicated in Consumable Materials in this section. The engine oil sump capacity is eight quarts. The normal operating range is six to eight quarts.

RECOMMENDED OIL GRADES FOR ENGINES

Average Ambient Air Temperature	MIL-L-6082 Grades	MIL-L-22851 Ashless Dispersant Grades
Above 60° F	SAE 50	SAE 40 or SAE 50
30° F to 90° F	SAE 40	SAE 40
0° F to 70° F	SAE 30	SAE 40 or SAE 30
Below 10° F	SAE 20	SAE 30

BATTERY

A 12-volt, 25 amp-hour, lead-acid battery, located directly aft of the cabin area may be reached by removing the rear panel.

Check the battery regularly for fluid level and add distilled water as required. Clean, tight connections should be maintained at all times. Battery vents should be checked periodically for obstructions and for proper protrusion (3 inches from top of chamfer to skin line).

TIRES

The airplane is equipped with tube type tires. Inflate the 17.50 x 6.00 x 6 main or nose gear tires to 22 psi and the 15 x 6.00 x 6 main or nose gear tires 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.

NOTE

Beech Aircraft Corporation 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 with the possibility of damage to the landing gear.

SHIMMY DAMPER

A hydraulic shimmy damper is mounted on the nose wheel strut yoke. Whenever this component develops an external leak or a skip in the damping action, it should be replaced.

BRAKES

MB-1 thru MB-264

The brake hydraulic fluid reservoir, an integral part of the master cylinders is located on the forward side of the rudder pedals. Refer to Consumable Materials in this section for hydraulic fluid specification.

MB-265 thru MB-460

The brake hydraulic fluid reservoir is located on the firewall in the engine compartment. Refer to Consumable Materials in this section for hydraulic fluid specification.

Since the pistons move to compensate for lining wear, the brakes require no adjustment. Complete information on brake, wheel, and tire maintenance is contained in the appropriate manual included in the loose tools and accessories kit.

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 and clean the filter:

1. Remove the filter retaining wing nuts and cover.
2. Remove the filter.
3. Clean and service as described in the manufacturer's instructions on the filter.
4. Reinstall the filter.
5. Reinstall the cover and retaining wing nuts. Tighten nuts to assure that the filter is secure and then resafety.

VACUUM SYSTEM

The foam rubber suction relief valve screen may be removed for cleaning by slipping it off the bottom of the valve. The screen may be cleaned with soap and water.

MB-289 thru MB-460

In addition, the airplane is equipped with a replaceable paper filter, mounted under the instrument panel on the upper left side of the firewall.

PROPELLER BLADES

The daily preflight inspection should include a careful examination of the propeller blades for nicks and scratches.

Each blade leading edge should receive particular attention. It is very important that all nicks and scratches be smoothed out and polished. The BEECHCRAFT Aero or Aviation Center and International Distributors or Dealers will be glad to answer any questions concerning propeller blade repair.

WARNING

When servicing a propeller, always make certain the ignition switch is off and that the engine has cooled completely. WHEN MOVING A PROPELLER, STAND IN THE CLEAR; 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 doors, the seals should be coated with Oakite 6 compound or powdered soapstone or equivalent.

ALTERNATOR

Since the alternator and voltage regulator are designed for use on only one polarity system, 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 booster battery, 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 open circuit. Be sure all circuit connections are secure.

5. Do not short across or ground any of the terminals on the alternator or 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 BEECHCRAFT Aero or Aviation Center or International Distributor or Dealer.

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

Do not apply wax or polish for a paint cure period of 90 days after delivery. Waxes and polishes seal the paint from the air and prevent curing. Wash uncured painted surfaces with cold or lukewarm water and a MILD NON-DETERGENT SOAP. Any rubbing of the surface should be done gently and held to a minimum to avoid cracking the paint film.

When washing the airplane with mild soap and water, use special care to avoid washing away grease from any lubricated area. After washing with solvent in the wheel well areas, lubricate all lubrication points. Premature wear of lubricated surfaces may result if the above precautions are not taken.

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 both static air buttons before washing or waxing.

Flush loose dirt away with clean water, then wash with a mild soap and water. Avoid harsh, abrasive, or alkaline soaps or detergents which could cause corrosion or scratches. To remove stubborn oil and grease, use a cloth dampened with aliphatic naphtha (see Consumable Materials). After being cleaned with naphtha, the surface should be re-waxed and polished. To prevent scratches, use soft cleaning cloths or a chamois when cleaning and polishing. Any good grade of automotive wax or polish can be used on painted surfaces.

WINDSHIELD AND WINDOWS

The windshield and plastic windows should be kept clean and waxed at all times. To prevent scratches, wash the windows carefully with plenty of soap and water, using the palm of the hand to feel and dislodge dirt and mud. A soft cloth, chamois or sponge may be used, but only to carry water to the surface. Rinse thoroughly, then dry with a clean, moist chamois. Rubbing the surface of the plastic with a dry cloth builds up an electrostatic charge which attracts dust particles in the air.

Remove oil and grease with a cloth moistened with isopropyl alcohol. Never use gasoline, benzine, alcohol, acetone, carbon tetrachloride, fire extinguisher fluid, anti-ice fluid, lacquer thinner or glass cleaner. These materials will soften the plastic and may cause it to craze.

After thoroughly cleaning, the surface should be waxed with a good grade of commercial wax. 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.

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 tissue 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; 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 panel, 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 isopropyl alcohol. Volatile solvents, such as gasoline, benzine, acetone, carbon tetrachloride, fire extinguisher fluid, anti-ice fluid, laquer thinner, or glass cleaner should not be used. These materials will soften the plastic and may cause it to craze.

ENGINE

Clean the engine with neutral solvent. Spray or brush the fluid over the engine, then wash off with water and allow to dry. Solutions which may attack rubber or plastic should not be used.

LUBRICATION

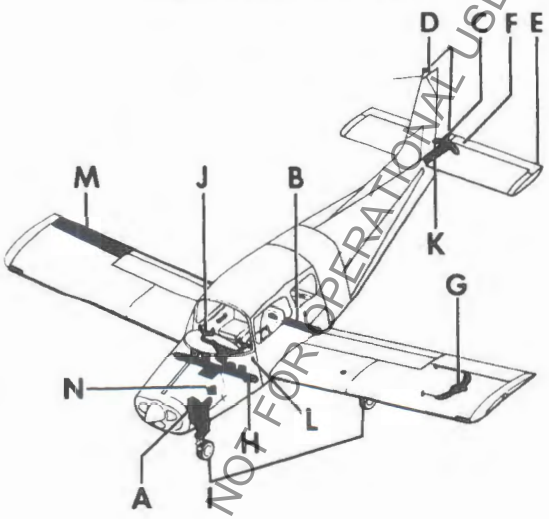
Proper lubrication is essential in keeping the airplane components in top condition. If this operation is performed thoroughly, general maintenance will be reduced and the service life of the airplane will be greatly increased.

The grease fittings or parts must be wiped clean to make sure that no dirt is carried into the part when lubricated. Apply lubricant sparingly, but with assurance that the bearing surfaces are adequately covered. Wipe off excess lubricant to prevent the accumulation of dust and foreign material.

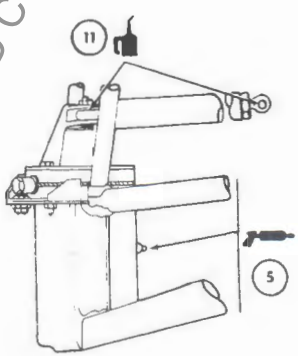
NOTE

Lubricate all pivotal points as shown on the Lubrication Diagram in the Shop Manual to ensure freedom of movement and proper functioning. More frequent lubrication may be required because of climate, or frequent usage of the airplane.

LUBRICATION POINTS

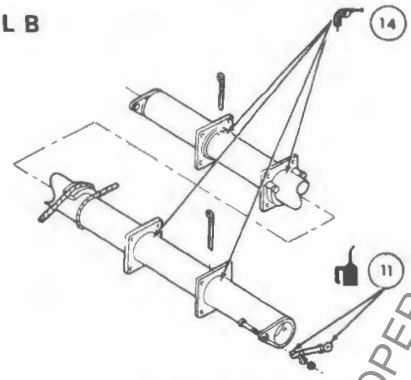


DETAIL A



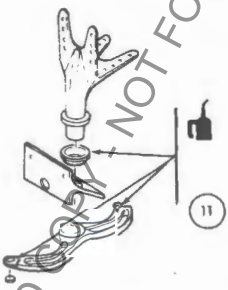
NOSE GEAR STEERING

DETAIL B



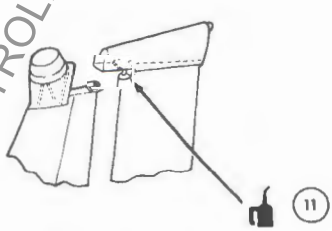
FLAP MECANISM

DETAIL C



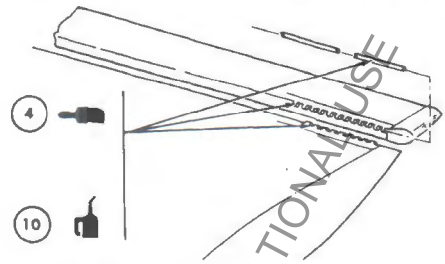
RUDDER BELLCRANK

DETAIL D



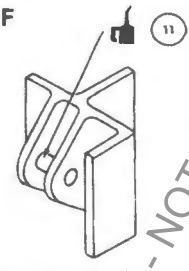
RUDDER HINGE

DETAIL E



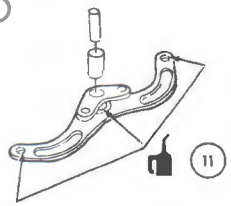
ELEVATOR HINGE

DETAIL F



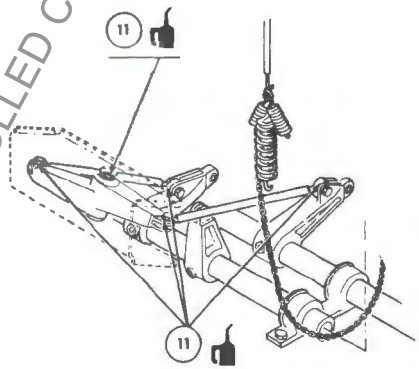
STABILATOR HINGE BRACKET

DETAIL G



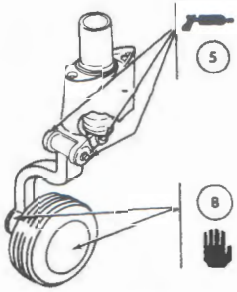
AILERON BELLCRANK

DETAIL H



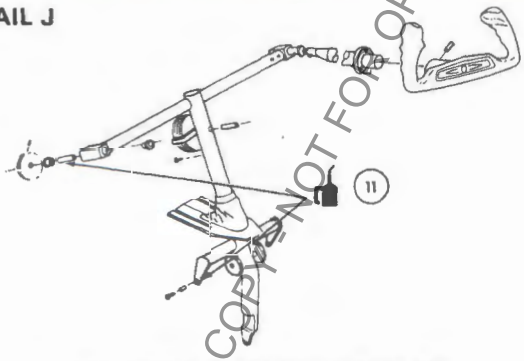
RUDDER PEDALS

DETAIL I



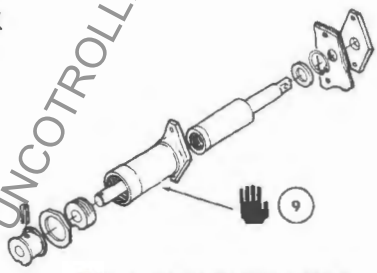
LANDING GEAR

DETAIL J



CONTROL COLUMN LINKAGE

DETAIL K



TRIM TAB ACTUATOR

DETAIL L

This screw must be completely tight to prevent binding.

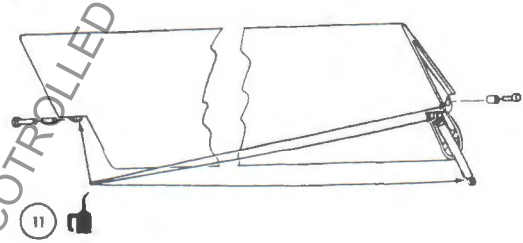
LOOSEN NUT, REMOVE VALVE CONE, AND LUBRICATE CONE WITH VERY THIN COATING OF LUBRICANT.

NOTE: Airplanes having complied with BEECHCRAFT S.I. No. 0622-289 or S.I. No. 0838 need no lubrication.

NOTE: DO NOT OVER LUBRICATE VALVE CONE APPLY MINIMUM AMOUNT OF LUBRICANT FOR COATING

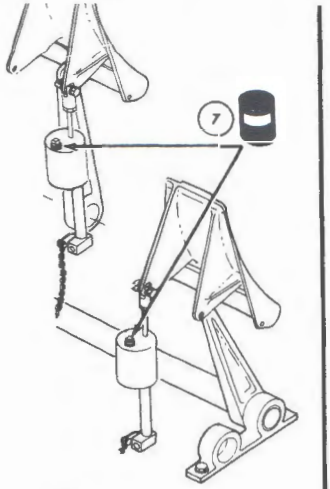
FUEL SELECTOR VALVE

DETAIL M



AILERON HINGE AND ROD ENDS

DETAIL N



MB-1 thru MB-264

MB-265 thru MB-460

BRAKE FLUID RESERVOIR

NOTE

Numbers refer to items in the consumable materials chart. Lubricate all plain bearing bushings as required or every 500 hours with SAE No. 30 oil. Apply SAE No. 20 oil to push-pull control housings as required. Lubricate flight control pully bushings with SAE No. 30 oil every 1000 hours.

SAE 10w/30 oil is an acceptable replacement for SAE 20 or SAE 30 oil.

RECOMMENDED SERVICING SCHEDULE

INTERVAL	ITEM	LOCATION (Letters refer to Lubrication Points Diagram)	LUBRICANT (Number refers to item on Consumable Materials)
Pre-flight	Check engine oil level	Upper right side of engine	1
	Drain fuel tank drains	Inboard bottom of wings	-
	Drain fuel system low spot	Bottom of fuselage	-
	Service fuel tanks	Top of wings	3
25 Hrs.	Check battery electrolyte	Behind aft cabin bulkhead	See Shop Manual
	Clean induction air filter	In lower forward cowl	-
	Lubricate landing gear knee pins	On landing gear (I)	5
50 Hrs.	Change engine oil	Lower side of engine	1
	Clean oil screens	Aft right side of accessory case and bottom of sump	2

RECOMMENDED SERVICING SCHEDULE

INTERVAL	ITEM	LOCATION (Letters refer to Lubrication Points Diagram)	LUBRICANT (Number refers to item on Consumable Materials)
100 Hrs.	Clean fuel system screens and strainers	Bottom of wings and fuselage	2
	Clean suction relief valve screen	Forward of firewall	-
	Lubricate wheel bearings	Landing gear (I)	8
	Lubricate nose gear rod end bearings	On top of nose gear (A)	11
	Lubricate nose gear swivel	On aft side of nose gear (A)	5
	Lubricate flap torque tubes	Under floorboards (B)	14
	Lubricate flap rod end bearings	Inboard end of flaps (B)	11
	Lubricate rudder bellcrank pivot points	Bottom of rudder (C)	11
	Lubricate rudder hinges	On rudder leading edge (D)	11
	Lubricate stabilator trim tab hinge and pin	On trailing edge of stabilator (E)	4, 10

	Lubricate stabilator hinge pivot point	In aft tail section (F)	11
	Lubricate aileron bellcrank	In wing forward of aileron (G)	11
	Lubricate aileron pivotal points and rod ends	Outboard trailing edge of wings (M)	11
300 Hrs.	Replace induction air filter	In front nose cowl	-
500 Hrs.	Lubricate rudder pedal bellcrank	Forward cabin floor (H)	11
	Lubricate rudder pedal rod ends	Forward cabin floor (H)	11
	Replace gyro instrument central filter (MB-289 thru MB460)	Behind instrument panel	-
1000 Hrs.	Lubricate control column pivot points	Behind instrument panel (J)	11
1200 Hrs.	Lubricate trim tab actuator	In aft tail section (K)	9

RECOMMENDED SERVICING SCHEDULE

INTERVAL	ITEM	LOCATION (Letters refer to Lubrication Points Diagram)	LUBRICANT (Number refers to item on Consumable Materials)
As Req.	Fuel selector valve	Center floorboard (L)	15
	Brake fluid reservoir		
	MB-1 thru MB-264	On individual rudder pedal linkage (N)	7
	MB-265 thru MB-460	On firewall (N)	7
	Clean spark plugs	In engine compartment	-
Per Applicable FAR	Replace Emergency Locator Transmitter Battery	-	-

NOTE: Anytime the control surfaces are altered, repaired, or repainted, they must be rebalanced per the Shop Manual.

CONSUMABLE MATERIALS

ITEM	MATERIAL	SPECIFICATION
*1.	Engine Oil	MIL-L-22851
2.	Solvent	PD680
**3.	Fuel, Engine	80/87 (red), 100LL (blue) or 100 (green) Grade
***4.	Lubricant, Powdered Graphite	MIL-C-6711
†5.	Grease (High & Low Temperature)	Aero Lubriplate
6.	Corrosion Preventive, Engine	MIL-C-6529
7.	Hydraulic Fluid	MIL-H-5606
††8.	Grease (General Purpose, Wide Temperature)	MIL-G-81322
††9.	Grease (High & Low Temperature)	MIL-G-23827
10.	Lubricating Oil (Low Temperature)	MIL-L-7870
11.	Lubricating Oil	SAE No. 20 or 10W/30
12.	Lubricating Oil	SAE No. 30 or 10W/30
†††13.	Lubricant, Rubber Seal	Oakite 6 Compound
††††14.	Lubricant, Silicone Spray	Krylon No. 1329 (or equivalent)

ITEM	MATERIAL	SPECIFICATION
15.	Lubricant, Fluorosilicone	Corning FS-1292
•16.	Engine Fuel Additive	Alcor TCP Concentrate

* Ashless dispersant oil complying with MIL-L-22851 is recommended after the oil consumption has stabilized or after the first 50 hours of operation. A straight mineral oil conforming to MIL-L-6082 may be used until the oil consumption has stabilized. Oil of seasonal viscosity, added to maintain the proper oil level during this break-in period, must comply with MIL-L-6082.

** If grade 80/87 (red) fuel is not available, use 100LL (blue) or 100 (green).

*** Mix with quick-evaporating liquid naphtha and apply with a brush.

† Product of BRC Bearing Company, Wichita, Kansas.

†† In extremely cold climates, MIL-G-23827 grease should be used in place of MIL-G-81322 grease. Care should be exercised when using either MIL-G-81322 or MIL-G-23827 grease, as they contain a rust-preventing additive which is harmful to paint.

††† Product of Oakite Products, Inc., 50 Valley Road, Berkley Heights, NJ 07922.

†††† Product of Krylon Inc., Norristown, Pa.

• Alcor TCP Concentrate mixed according to the instructions provided by Alcor Inc., Alcor Inc. 10130 Jones-Maltsberger Road P.O. Box 32516 San Antonio, Texas 78284.

APPROVED ENGINE OILS

COMPANY	BRAND NAME
Delta Petroleum Co., Inc.	*Global Concentrate A
Enjay Chemical Company	*Paranox 160 and 165
Mobil Oil Corporation	*RT-451, RM-173E, RM-180E
Shell Oil Company	*Shell Concentrate A - Code 60068 *Aeroshell W120 *Aeroshell W80
Texaco Incorporated	*TX-6309 *Aircraft Engine Oil Premium AD120 *Aircraft Engine Oil Premium AD80
American Oil and Supply Co.	*PQ Aviation Lubricant 753
Chevron Oil Company	*Chevron Aero Oil Grade 120
Humble Oil and Refining Co.	*Esso Aviation Oil E-120 *Enco Aviation Oil E-120 *Esso Aviation Oil A-100 *Enco Aviation Oil A-100 *Esso Aviation Oil E-80 *Enco Aviation Oil E-80
Standard Oil Company of California	*Chevron Aero Oil Grade 120

COMPANY	BRAND NAME
Castrol Oils, Canada Ltd.	**Castrolaero 113, Grade 1065 **Castrolaero 117, Grade 1100
Champlin Oil and Refining Co.	**Grade 1065 **Grade 1100
Chevron Oil Company	**Chevron Aviation Oil 65 **Grade 1100
Continental Oil Company	**Conoco Aero Oil 1065 **Conoco Aero Oil 1100
Mobil Oil Corporation	**Avrex 101/1065 **101/1100
Phillips Petroleum Co.	**Phillips 66 Aviation Engine Oil, Grade 1065 **Phillips 66 Aviation Engine Oil, Grade 1100
Shell Oil Company	**Aeroshell Oil 65 **Aeroshell Oil 100

* Ashless Dispersant Oils Complying with MIL-L-22851

NOTE

Ashless dispersant oil complying with MIL-L-22851 is recommended after the oil consumption has stabilized or after the first 50 hours of operation.

** Straight Mineral Oils Complying with MIL-L-6082

NOTE

A straight mineral oil conforming to MIL-L-6082 may be used until the oil consumption has stabilized. Oil of seasonal viscosity, added to maintain the proper oil level during this break-in period, must comply with MIL-L-6082.

Vendors listed as meeting Federal and Military Specifications are provided as reference only and are not specifically recommended by Beech Aircraft Corporation. Any product conforming to the specification may be used.

BULB REPLACEMENT GUIDE

LOCATION	NUMBER
Compass light	330
Dome light, cabin	89
Instrument flood light, overhead	89
Landing light, wing	4313
Navigation light, tail cone	1777
Navigation light, wing	1512
Rotating beacon	WRM-44K or WRM-1940
Engine instrument cluster	330R
*Landing gear position indicators	330

*If simulated retractable landing gear switch kit is installed.

OVERHAUL OR REPLACEMENT SCHEDULE

The first overhaul or replacement should be performed not later than the required period. The condition of the item at the end of the first period can be used as a criterion for determining subsequent periods applicable to the individual airplane or fleet operation, providing the operator has an approved monitoring system.

The time periods for inspection noted in this handbook are based on average usage and average environmental conditions.

SPECIAL CONDITIONS CAUTIONARY NOTICE

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.

COMPONENT	OVERHAUL OR REPLACE
LANDING GEAR	
Brake Assembly	On Condition
Brake Lining	On Condition
Master Cylinder	On Condition
Parking Brake Valve	On Condition
All Hose	On Condition
Shimmy Damper	On Condition
Wheels and Tires	On Condition
POWER PLANT	
Engine	
0-320-E2B	2000 hours
0-320-E2C	2000 hours
0-320-E2D	2000 hours
Engine Controls	On Condition
Engine Vibration Isolator Mounts	Engine Change or on condition

NOTE

When an engine has been overhauled, or a new engine installed, it is recommended that low power settings NOT be used until oil consumption has stabilized. The average time for piston ring seating is approximately 50 hours. Refer to Lycoming Engine Operator's Manual.

COMPONENT	OVERHAUL OR REPLACE
Exhaust System	800 hours or on condition
Magnetos	At engine overhaul (Bendix)
Starter	Inspect at engine overhaul; overhaul or replace on condition
Alternator	On Condition
Oil Cooler	On Condition (replace when contaminated)
Propeller	On Condition or 1000 hours
Engine Driven Fuel Pump	At Engine Overhaul or On Condition
Cabin Heat Muff	Inspect every 100 hours
All Hose carrying flammable liquid	At engine overhaul or every 5 years. All other hoses on condition.
Vacuum System Filter	Every 300 Hours
Vacuum Regulator Valve	On Condition
Vacuum Pump	At engine overhaul or on condition.

FUEL SYSTEM

Fuel Boost Pump	On condition
All Hose carrying flammable liquid	At engine overhaul or every 5 years
All Hose not carrying flammable liquid	On Condition
Fuel Selector Valve	Inspect every 100 hours; overhaul on condition
Fuel System Check Valves	On Condition
Fuel Cell Drain Valve	On Condition
Wing Fuel Quantity Transmitters	On Condition

COMPONENT	OVERHAUL OR REPLACE
INSTRUMENTS	
Turn Coordinator	On Condition
Altimeter	Every 24 months per FAA Directive (Inspect and calibrate)
Directional Gyro	On Condition
Instrument Air	On Condition
Engine Indicator Units	On Condition
Airspeed Indicator	On Condition
Rate-of-Climb Indicator	On Condition
Fuel Quantity Indicator	On Condition
Fuel Pressure Indicator	On Condition
Tachometer	On Condition
Free Air Temperature Indicator	On Condition
Flap Position Indicator	On Condition
ELECTRICAL SYSTEM	
Battery Master Relay	On Condition
All other Relays	On Condition
Voltage Regulator	On Condition
Starter Relay	On Condition
FLAPS AND FLIGHT CONTROLS	
Flight Controls	On Condition
Stabilator Tab Actuator	On Condition
Flap Motor and Actuator Drive Assembly	On Condition
Flap Motor Brushes	On Condition

COMPONENT	OVERHAUL OR REPLACE
MISCELLANEOUS	
Seat Belts and Shoulder Harness	Inspect every 12 months, replace on condition
Hand Fire Extinguisher	Inspect every 12 months, recharge as necessary
Cabin Heating and Ventilating Ducts	On Condition, Inspect every 12 months
Transponder	Test and inspect every 24 months

INSPECTIONS

The FAA requires that an airplane used for hire be inspected at each 100 hours of operation by qualified personnel. Airplanes which are not used for hire are required to have an inspection by qualified personnel on an annual basis.

Good operating practice requires that the airplane be preflighted prior to takeoff. Items found during preflight and engine run-up should be corrected on the basis of their importance to the safe operation of the airplane; however, in any event, early correction of items found is good preventative maintenance.

Although it is not a requirement that FAA qualified personnel change the oil and inspect the airplane, except at the 100-hour/annual inspection, as noted above, it is recommended the airplane be given an inspection at the recommended oil change period. Any unsatisfactory items should be corrected, either at that time or as soon as practical, depending on the nature of the item.

The inspection at the recommended oil change interval should include the following:

Operational Inspection

1. Alternator/voltage regulator functioning
2. Engine instruments
3. Flight instruments
4. Idle rpm and mixture
5. Engine controls operation
6. All lights
7. Radio operation
8. Magneto check
9. Brake operation
10. Tank selector operation
11. Heat and vent system operation
12. Starter operation
13. Electrical switches and circuit breakers
14. Power check 2300 to 2400 rpm static

Power Plant

1. Oil screens cleaned.
2. Induction air filter cleaned.
3. Check engine controls, wiring harness, and plumbing for clearance and security.
4. Check propeller for rock damage, and spinner and spinner bulkheads for cracks and security; engine for oil leaks.
5. Check engine baffles and cowling for cracks and security.
6. Check exhaust system and air ducts for condition and security.
7. Check for indications of oil leaks, condition and security of engine accessories.
8. Check brake system reservoir(s).

Cabin and Aft Fuselage

1. Flight control operation through full travel and proper direction of travel.
2. Storm window and door operation.
3. Check interior furnishings and seat belts.
4. Check battery water level.

Exterior

1. Check flight control surfaces for condition and security.
2. Check tires, brake pucks and discs.
3. Check static ports, pitot mast and fuel vent lines for obstructions.
4. Check general condition of fuselage and wings.

INTENTIONALLY LEFT BLANK

SECTION IX

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. 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 Supplements for other equipment that was installed after the airplane was delivered new from the factory should be placed in this SUPPLEMENTS Section of this Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

INTENTIONALLY LEFT BLANK

PILOT'S OPERATING HANDBOOK

and

FAA APPROVED AIRPLANE FLIGHT MANUAL

LOG OF SUPPLEMENTS

FAA Supplements must be in the airplane for flight operation when subject equipment is installed:

Supp. No.	Part Number	Subject	Rev. No.	Date
1	169-590004-5	Acrobatic		10/79
2	169-590002-9	Two-Door Walk-Around		10/79
3	169-590002-11	Aeroplanes Registered in The United Kingdom	1	1/82

INTENTIONALLY LEFT BLANK

PILOT'S OPERATING HANDBOOK AND
FAA APPROVED AIRPLANE FLIGHT MANUAL
SUPPLEMENT

for the 19A

when approved for ACROBATIC MANEUVERS

The airplane must conform to Modification C.O. C 46786 and have Kit No. 23-4007-1 installed.

The following maneuvers are approved ONLY when the above modifications have been completed and when the airplane is operated in the UTILITY CATEGORY at 2030 lbs or less. The pilot and copilot must be wearing approved parachutes before performing these maneuvers.

WARNING

The airplane cabin area should be clean and free of any loose equipment before attempting these maneuvers.

LOOP

The maneuver is entered at 140 MPH/122 KTS IAS at 2700 RPM. A 3.0 to 3.5 G pull-up is recommended. The airspeed at the top of the loop will be 50 to 60 MPH/43 to 52 KTS IAS which is fast enough to retain positive acceleration and prevent a stall. Completion of the loop is accomplished by keeping the G level just below that where a buffet occurs. The altitude loss is 50 to 100 feet.

IMMELMANN

The maneuver is entered at 150 MPH/130 KTS IAS at 2700 RPM. A 3.5 G pull-up is recommended. The roll to the left should be initiated either just before or just as the airplane inverts. Adverse yaw during the roll will be encountered. A roll to the right will result in the airplane turning sideways and usually stalling.

SNAP ROLL

The maneuver is entered at 100 MPH/87 KTS IAS for a single roll or 105 to 110 MPH/91 to 96 KTS IAS for double rolls. Ailerons are kept neutral until initiation of recovery.

BARREL AND AILERON ROLL

Both maneuvers are entered at 130 MPH/113 KTS IAS in a shallow dive.

SPLIT-S

The maneuver is entered at 90 MPH/78 KTS IAS. The airplane is rolled either way to invert. The maximum speed is 140 MPH/122 KTS IAS, with acceleration at 3.5 G's. The altitude loss will be 800 feet. The throttle is to be retarded as the nose drops past the horizon in the inverted position.

WARNING

Do not use abrupt or full control travel at speeds greater than the maximum design maneuvering speed.

Spins are approved. Spins have not been demonstrated in excess of 6 turns. For spin entry and recovery see pages 3-10 and 3-11 of this Pilot's Operating Handbook and FAA Approved Flight Manual.

Continuous inverted flight is prohibited.

Acrobatic maneuvers are prohibited with door hold-open installed.

Approved:

for W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

FAA Approved
Revised: October 1979
P/N 169-590004-5

BEECHCRAFT LANDPLANE

PILOT'S OPERATING HANDBOOK AND
FAA APPROVED AIRPLANE FLIGHT MANUAL
SUPPLEMENT

for the

WALK-AROUND INSPECTION

of the

TWO DOOR A23-19, 19A

GENERAL

This document is to be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the airplane is modified with left and right doors which have been installed in accordance with BEECHCRAFT FAA approved data.

This document supersedes or adds to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only where covered in the items contained herein.

LIMITATIONS - No change

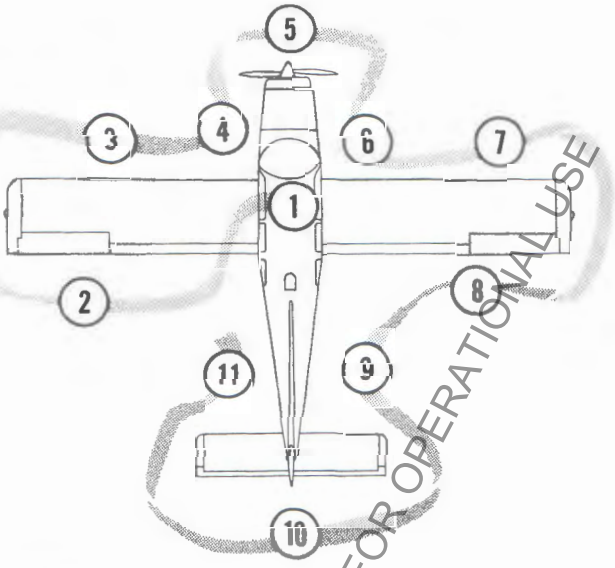
EMERGENCY PROCEDURES - No change

NORMAL PROCEDURES

PREFLIGHT INSPECTION

Emergency Locator Transmitter - ARMED
Location may vary with individual airplanes

FAA Approved
October, 1979
P/N 169-590002-9



1. *CABIN:*
   a. Parking Brake - SET
   b. Control Lock - REMOVE
   c. All Switches - OFF

2. *LEFT WING TRAILING EDGE:*
   a. Flap - CHECK
   b. Fuel Vent Line - UNOBSTRUCTED
   c. Aileron - CHECK
   d. Wing Tip - CHECK
   e. Position Light - CHECK

3. *LEFT WING LEADING EDGE:*
   a. Pitot Tube - CHECK, (Remove Cover)
   b. Landing Light - CHECK
   c. Tie Down and Chocks - REMOVE
   d. Stall Warning - CHECK for movement of vane
   e. Fuel Tank - CHECK QUANTITY; Filler Cap - SECURE.

4. *LEFT LANDING GEAR:*
   a. Tire and Nose Gear - CHECK
   b. Fuel Sump - DRAIN

5. *NOSE SECTION:*
   a. Left Cowl - SECURE
   b. Induction Air Intake - CLEAR
   c. Propeller - CHECK, General Condition, Nicks, etc.
   d. Tire and Nose Gear - CHECK
   e. Engine Oil - CHECK (See Servicing, Section 8) Cap and Dipstick - SECURE
   f. Right Cowl - SECURE
   g. Fuel Strainer - DRAIN
   h. Chocks - REMOVE

6. *RIGHT LANDING GEAR:*
   a. Fuel Sump - DRAIN
   b. Tire and Brake - CHECK

7. *RIGHT WING LEADING EDGE:*
   a. Fuel Tank - CHECK QUANTITY; Filler Cap - SECURE
   b. Tie Down and Chocks - REMOVE
   c. Wing Tip - CHECK
   d. Position Light - CHECK

8. *RIGHT WING TRAILING EDGE:*
   a. Aileron - CHECK
   b. Flap - CHECK
   c. Fuel Tank Vent Line - UNOBSTRUCTED

9. *RIGHT FUSELAGE:*
   a. Static Pressure Button - UNOBSTRUCTED

10. *EMPENNAGE:*
    a. Control Surfaces - CHECK
    b. Tie Down - REMOVE
    c. Position Light - CHECK

11. *LEFT FUSELAGE:*
    a. Static Pressure Button - UNOBSTRUCTED
    b. All Antennas - CHECK

PERFORMANCE - No change

Approved:

Donald St Pete
for W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

FAA Approved
October, 1979
P/N 169-590002-9

BEECHCRAFT MUSKETEER A23-19 & 19A LANDPLANES PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT for AEROPLANES REGISTERED IN THE UNITED KINGDOM

GENERAL

This document is to be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when operating on the United Kingdom Register. The contents are in addition to, or override, the contents of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

LIMITATIONS

The aeroplane must be flown in accordance with the limitations listed below in addition to those contained in the Pilot's Operating Handbook and in any relevant supplement. This supplement overrides the handbook should there be disagreement between the two documents.

1. For the purpose of the first schedule of the Air Navigation Order, this aeroplane is classified as an Aeroplane (landplane).

2. The BEECHCRAFT models A23-19 and 19A are eligible for certification in the United Kingdom in the Transport Category (Passenger). This aeroplane may, however, be restricted to a particular use and to another category and this will be stated in the certificate of airworthiness.

3. When compliance with the Air Navigation (General) Regulations for weight and performance is required, the aeroplane is classified in performance group E.

FAA Approved
Revised: January, 1982
P/N 169-590002-11

4. For the purpose of compliance with the regulations governing flight over water, a true airspeed of 100 knots (115 mph) must be used.

5. The aeroplane may be flown at night or in instrument meteorological conditions (IMC) when permitted by the air navigation legislation and when the equipment required by that legislation is carried.

6. The maximum number of occupants, including the pilot, is the lesser of four and the number of approved seats fitted. When aerobatic manoeuvres are to be performed, the rear seats shall not be occupied. Provided that aerobatic manoeuvres are not to be performed, children under the age of three years may be carried in the arms of passengers and left out of the total number count.

7. The aeroplane may be operated on short dry grass surfaces. When so operating, the take-off and landing distances given in Section V of the Pilot's Operating Handbook must be increased by 10%.

8. When flying for public transport, the effect of temperature on the rate of climb of the aeroplane must be taken into account.

   For every 10°C above standard, the rate of climb obtained from Section V of the Pilot's Operating Handbook must be reduced by 60 feet per minute.

EMERGENCY PROCEDURES - No change

NORMAL PROCEDURES - No change

PERFORMANCE

1. Take-off and landing distances contained in the Pilot's Operating Handbook shall be increased by 10 percent when operating on short dry grass.

2. Rate-Of-Climb figures contained in the Pilot's Operating Handbook shall be decreased 60 ft/min for every 10 degrees Centigrade above standard.

WEIGHT AND BALANCE - No change

SYSTEMS DESCRIPTION - No change

HANDLING, SERVICING AND MAINTENANCE

No change

APPROVED: Donald H Peter

for W. H. Schultz
Beech Aircraft Corporation
DOA CE-2

SECTION X
SAFETY INFORMATION
TABLE OF CONTENTS

SUBJECT	*PAGE*
Introduction	10-3
General	10-5
Do's	10-5
Don'ts	10-6
Sources of Information	10-7
Pilot's Operating Handbook and FAA Approved Airplane Flight Manual	10-7
BEECHCRAFT Service Publications	10-8
Federal Aviation Regulations	10-10
Airworthiness Directives	10-10
Airman's Information Manual	10-10
Advisory Information	10-11
FAA Advisory Circulars	10-12
FAA General Aviation News	10-15
FAA Accident Prevention Program	10-15
Additional Information	10-16
General Information on Specific Topics	10-17
Maintenance	10-17
Hazards of Unapproved Modifications	10-19
Flight Planning	10-20
Passenger Information Cards	10-20
Stowage of Articles	10-21
Flight Operations	10-21
General	10-21
Preflight Inspection	10-21
Weight and Balance	10-22
Autopilots and Electric Trim Systems	10-23
Flutter	10-26
Turbulent Weather	10-27
Wind Shear	10-30
Weather Radar	10-30
Mountain Flying	10-32
VFR - Low Ceilings	10-33
VFR at Night	10-33
Vertigo - Disorientation	10-34

SECTION X
SAFETY INFORMATION
TABLE OF CONTENTS (Continued)

SUBJECT *PAGE*

Stalls, Slow Flight and Training 10-36
Spins 10-36
Descent 10-38
Vortices - Wake Turbulence 10-39
Takeoff and Landing Conditions 10-40
Medical Facts for Pilots 10-40
General 10-40
Fatigue 10-41
Hypoxia 10-41
Hyperventilation 10-43
Alcohol 10-43
Drugs 10-45
Scuba Diving 10-45
Carbon Monoxide and Night Vision 10-45
Decompression Sickness 10-46

A Final Word 10-47

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 airpianes 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 counter-roll 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 lightheaded 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

THIS PAGE INTENTIONALLY LEFT BLANK