

# Beechcraft<sup>®</sup>

## Baron<sup>®</sup> 95-B55

(Serials TC-2003 and After)

and

**95-B55A**

Special Reduced  
Gross Weight  
Configuration

### Pilot's Operating Handbook *and* FAA Approved Airplane Flight Manual

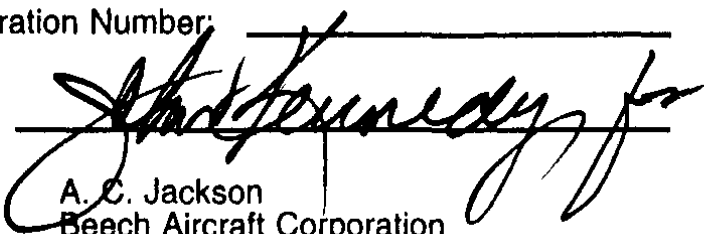
FAA Approved in the Normal Category based on CAR 3. This document must be carried in the airplane at all times and be kept within reach of the pilot during all flight operations.

This handbook includes the material required to be furnished to the pilot by CAR 3.

Airplane Serial Number: \_\_\_\_\_

Airplane Registration Number: \_\_\_\_\_

FAA Approved: \_\_\_\_\_

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

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Revised: July, 1994

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**NOTE**

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**Beech**

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**Hawker**

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**GAMA**

Member of GAMA

General Aviation  
Manufacturers Association

Beechcraft

# LOG OF TEMPORARY CHANGES

Baron 95-B55 and 95-B55A

Pilot's Operating Handbook  
and

FAA Approved Airplane Flight Manual

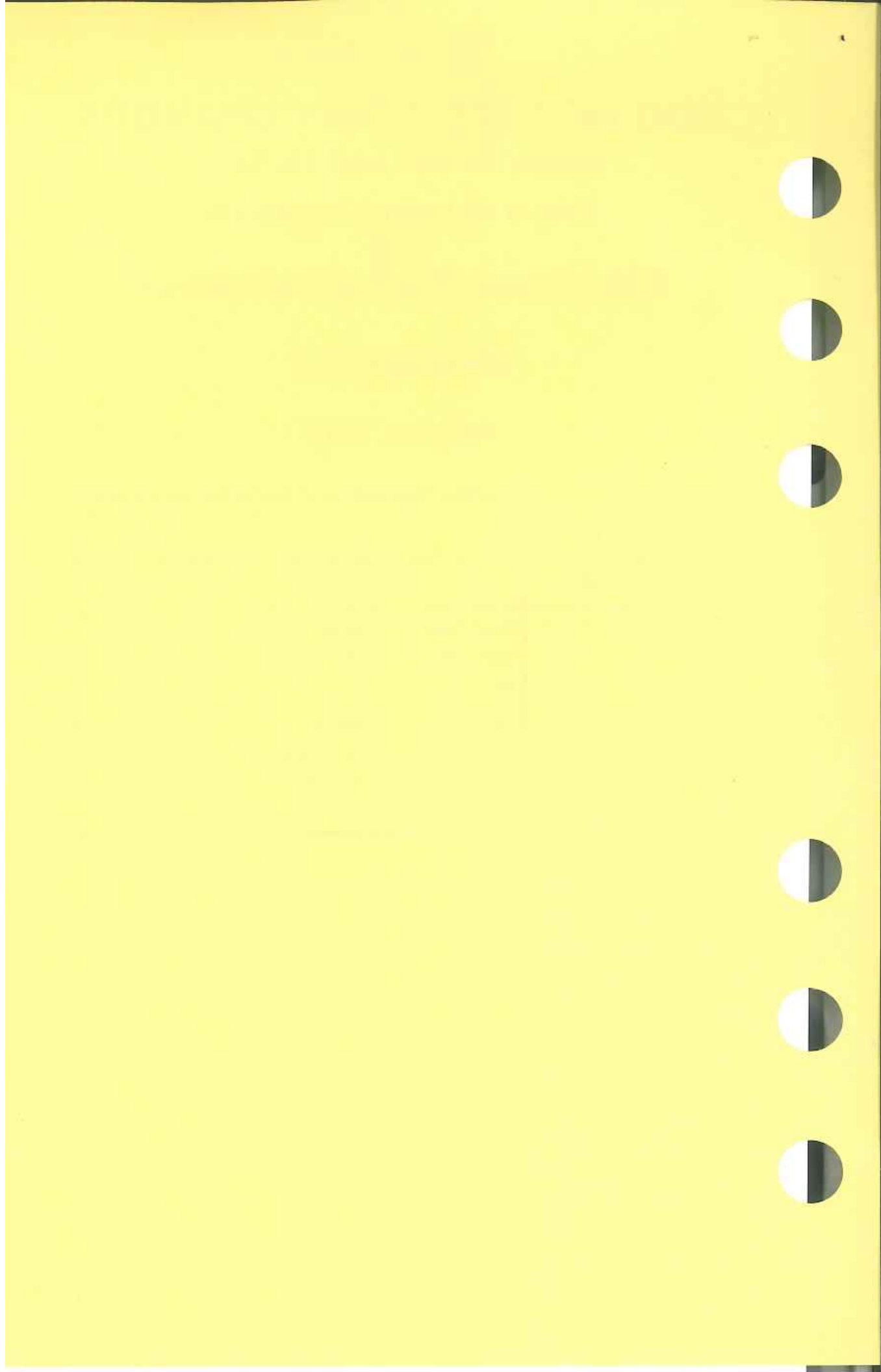
P/N 96-590011-17

August, 2019

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

| PART NUMBER     | SUBJECT                                                                                         | DATE         |
|-----------------|-------------------------------------------------------------------------------------------------|--------------|
| 96-590011-17TC1 | Fuel Selector Placard Installation (affects Limitations Section).                               | Aug 26, 1997 |
| 96-590011-17TC2 | Reduction of Positive Maneuvering Load Factor (Flaps Up) to 3.8g (affects Limitations Section). | August, 2019 |

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





**Beechcraft**  
**Baron 95-B55 and 95-B55A**

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

**P/N 96-590011-17TC2**

**Publication  
Affected:** 95-B55 and 95-B55A Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (P/N 96-590011-17, Issued October, 1976 or Subsequent)

**Airplane Serial  
Numbers Affected:** TC-2003 and After

**Description of  
Change:** Reduction of Positive Maneuvering Load Factor (Flaps Up) to 3.8g.

**Filing  
Instructions:** Insert this Temporary Change into the 95-B55 and 95-B55A Pilot's Operating Handbook and FAA Approved Airplane Flight Manual immediately following page 2-10 (Section II, LIMITATIONS).

Retain the Temporary Change pages until rescinded or replaced.

## LIMITATIONS

### FLIGHT LOAD FACTORS (5100 POUNDS)

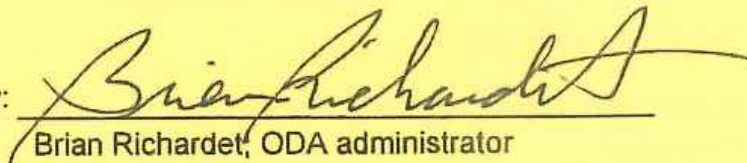
Positive Maneuvering Load Factor:

Flaps Up. . . . . 3.8G

Negative Maneuvering Load Factor:

Flaps Up. . . . . 3.0G

FAA Approved by:

  
Brian Richardet, ODA administrator  
Textron Aviation Inc.  
ODA-100129-CE

**Baron 95-B55/95-B55A**  
**Log of Temporary Changes**  
**to the**  
**Pilot's Operating Handbook**  
*and*  
**FAA Approved Airplane Flight Manual**  
**P/N 96-590011-17**

| Part Number     | Subject                            | Date         |
|-----------------|------------------------------------|--------------|
| 96-590011-17TC1 | Fuel Selector Placard Installation | Aug 26, 1997 |

**August 26, 1997**

**BARON 95-B55 AND 95-B55A  
(TC-2003 AND AFTER)  
PILOT'S OPERATING HANDBOOK  
AND  
FAA APPROVED AIRPLANE FLIGHT MANUAL**

A11 Revision . . . . . July, 1994

**LOG OF REVISIONS**

| <b>Page</b>        | <b>Description</b>                                   |
|--------------------|------------------------------------------------------|
| Title Page         | Updated                                              |
| Page A (A11)       | New                                                  |
| 10-1 thru<br>10-64 | Revised Section X, Safety<br>Information (May, 1994) |

**A11**

**BARON 95-B55 AND 95-B55A  
(TC-2003 AND AFTER)  
PILOT'S OPERATING HANDBOOK  
AND**

**FAA APPROVED AIRPLANE FLIGHT MANUAL**

A10 Revision . . . . . October, 1990

**LOG OF REVISIONS**

| Page               | Description                                              |
|--------------------|----------------------------------------------------------|
| Title Page         | Updated                                                  |
| Page A<br>(A10)    | New                                                      |
| 10-1 thru<br>10-68 | Revised Section X,<br>Safety Information (October, 1990) |

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**Baron B55 (TC-2003 and After)  
Pilot's Operating Handbook  
and  
FAA Approved Airplane Flight Manual  
P/N 96-590011-17**

**LOG OF REVISIONS**

"A9 Revision" ..... March, 1988

| Page          | Description                                      |
|---------------|--------------------------------------------------|
| Title Page    | Updated                                          |
| Page A (A-9)  | Updated                                          |
| 2-10          | Revised: "KINDS OF OPERATION"                    |
| 2-11          | Revised "WARNING"                                |
| 4-20          | Revised "ICE PROTECTION SYSTEMS"                 |
| 4-21          | Changed "CAUTION" to "WARNING"                   |
| 8-49          | Revised: "OVERHAUL OR<br>REPLACEMENT<br>SCHEDULE |
| <div>A9</div> |                                                  |

**Baron B55 (TC-2003 and After)**  
**Pilot's Operating Handbook**  
**and**  
**FAA Approved Airplane Flight Manual**

A8 . . . . . March 1983

**LOG OF REVISIONS**

| <b>PAGES</b>      | <b>DESCRIPTION</b>                      |
|-------------------|-----------------------------------------|
| Title Page        | Update                                  |
| Page A (A8)       | Update                                  |
| a & b             | Revise "Introduction" and Add "Warning" |
| 1-4A & 1-5        | Revise "NOTE"                           |
| 2-27              | Add Placard                             |
| 2-30              | Revise "Emergency Exit" Placard         |
| 3-2               | Update Table of Contents                |
| 3-3, 3-4          | Revise "Emergency Airspeeds," Add       |
|                   | Stall Warning Horn Advisory and         |
|                   | Shift Material                          |
| 3-16              | Revise "Emergency Exits"                |
| 4-1               | Update Table of Contents                |
| 4-3               | Revise "Airspeeds For Safe              |
|                   | Operation (5100 lbs)"                   |
| 4-7 & 4-8         | Revise "Starting" Caution and Shift     |
|                   | Material                                |
| 4-9 & 4-10        | Revise "After Starting And Taxi" and    |
|                   | "Before Takeoff"                        |
| 5-28A             | Revise "Power" Setting                  |
| 5-33              | Revise "Recommended Cruise Power        |
|                   | RPM"                                    |
| 5-35, 5-36, 5-37  | Revise Format and "GPH" columns         |
| & 5-38            |                                         |
| 7-2               | Update Table of Contents                |
| 7-16, 7-16A       | Revise "Openable Cabin Windows"         |
| 7-17              | Add "Emergency Exits"                   |
| 8-2               | Update Table of Contents                |
| 8-27, 8-28, 8-28A | Revise "Cleaning - Exterior Painted     |
| & 8-28B           | Surfaces" and Shift Material            |
| 8-42, 8-42A       | Revise "Consumable Materials"           |
| 8-42B & 8-43      |                                         |
|                   | <b>A8</b>                               |

**A7** ..... November, 1982

| Page        | Description                         |
|-------------|-------------------------------------|
| Title Page  | Added Revision Date                 |
| A Page (A7) | Update                              |
| 4-3         | Revised "Speeds for Safe Operation" |
| 4-9         | Revised "Before Take-off"           |

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**Baron B55 (TC-2003 and After)  
Pilot's Operating Handbook  
and  
FAA Approved Airplane Flight Manual**

A6 ..... February, 1981

**LOG OF REVISIONS**

| Page                                                                                                                                                         | Description                       |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|
| Title Page                                                                                                                                                   | Added Revision Date               |
| Logo Page                                                                                                                                                    | Added                             |
| A Page (A6)                                                                                                                                                  | Update                            |
| 7-30                                                                                                                                                         | Revised "Cabin Heating"           |
| 7-32                                                                                                                                                         | Revised "Enivronmental Schematic" |
| 7-33                                                                                                                                                         | Revised "Heat Regulation"         |
| 7-34                                                                                                                                                         | Revised "Cabin Ventilation"       |
| <div style="border: 1px solid black; padding: 10px; text-align: center;"> <b>10 - 1 Thru 10 - 67<br/>Revised Safety Section<br/>Dated March 1981.</b> </div> |                                   |
|                                                                                                                                                              |                                   |
| <div style="border: 1px solid black; width: 50px; height: 30px; float: right; padding: 2px;"> <b>A6</b> </div>                                               |                                   |

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**Baron B55 (TC-2003 and After)  
Pilot's Operating Handbook  
and  
FAA Approved Airplane Flight Manual**

**A5.....May, 1980**

**LOG OF REVISIONS**

| Page          | Description                                                      |
|---------------|------------------------------------------------------------------|
| Title Page    | Add Revision Date                                                |
| Page A (A5)   | Update                                                           |
| 1-1           | Revised "Table of Contents"                                      |
| 1-4           | Revised "Important Notice" and "Use of Handbook"                 |
| 1-9           | Revised "Engines"                                                |
| 1-16          | Revised "Power Terminology"                                      |
| 2-1           | Revised "Table of Contents"                                      |
| 2-5           | Revised "Engines"                                                |
| 2-6           | Shifted Material                                                 |
| 2-7           | Added "Fuel Flow"                                                |
| 2-11 and 2-12 | Revised "Required Equipment for Various<br>Conditions of Flight" |
| 2-25 and 2-26 | Revised "Placards"                                               |
| 2-27          | Shifted Material                                                 |
| 2-30 and 2-31 | Revised "Placards"                                               |
| 3-1           | Revised "Table of Contents"                                      |
| 3-2           | Updated "Table of Contents"                                      |
| 3-10          | Shifted Material                                                 |
| 3-11          | Added "Starter Energized Warning Light<br>Illuminated"           |
| 3-12          | Shifted Material                                                 |
| 3-16          | Revised "Emergency Exit"                                         |
| 3-17 and 3-18 | Shifted Material                                                 |
| 4-1           | Revised "Table of Contents"                                      |
| 4-4 and 4-5   | Revised "Preflight Inspection"                                   |
| 4-6           | Revised "Before Starting"                                        |
| 4-7           | Revised "Before Starting" and "Starting"                         |
| 4-8           | Revised "Starting"                                               |
| 4-9 and 4-10  | Revised "Before Take-off"                                        |
| 4-10A         | Revised "Maximum Normal Operating Power<br>Climb"                |

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**Baron B55 (TC-2003 and After)  
Pilot's Operating Handbook  
and  
FAA Approved Airplane Flight Manual**

**A5.....May, 1980**

**LOG OF REVISIONS**

| Page                                                  | Description                                                                                                                                                                                                                                                                                          |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 4-27<br>5-28A<br>5-39<br>5-40<br>5-41<br>5-42<br>6-10 | Revised "Noise Characteristics"<br>Revised "Climb - Two Engine"<br>Revised "Range Profile - 100 Gallons"<br>Revised "Endurance Profile - 100 Gallons"<br>Revised "Range Profile - 136 Gallons"<br>Revised "Endurance Profile - 136 Gallons"<br>Revised "Seating, Baggage and Equipment Arrangements" |
| 7-2                                                   | Revised "Table of Contents"                                                                                                                                                                                                                                                                          |
| 7-16 and 7-17                                         | Revised "Openable Cabin Windows"                                                                                                                                                                                                                                                                     |
| 7-18 and 7-19                                         | Shifted Material                                                                                                                                                                                                                                                                                     |
| 7-21                                                  | Shifted Material                                                                                                                                                                                                                                                                                     |
| 7-22A                                                 | Revised "Fuel Flow and Pressure Indicator"                                                                                                                                                                                                                                                           |
| 7-22B and 7-23                                        | Added "Fuel Flow Indicator"                                                                                                                                                                                                                                                                          |
| 7-26                                                  | Revised "Power Distribution Schematic"                                                                                                                                                                                                                                                               |
| 7-28                                                  | Revised "Alternators" and "Starters"                                                                                                                                                                                                                                                                 |
| 7-29                                                  | Shifted Material                                                                                                                                                                                                                                                                                     |
|                                                       |                                                                                                                                                                                                                                                                                                      |

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**Baron B55 (TC-2003 and After)  
Pilot's Operating Handbook  
and  
FAA Approved Airplane Flight Manual**

A4 . . . . . September, 1979

**LOG OF REVISIONS**

| PAGE          | DESCRIPTION                           |
|---------------|---------------------------------------|
| Title Page    | Add Revision Date and Letter          |
| Page A (A4)   | Update                                |
| 1-9           | Revised "Engines"                     |
| 1-10          | Revised "Propellers" and "Fuel"       |
| 1-16          | Revised "Power Terminology"           |
| 2-3           | Revised "Airspeed Limitations"        |
| 2-4           | Revised "Airspeed Indicator Markings" |
| 2-5           | Revised "Engines", "Fuel" and "Oil"   |
| 2-6           | Revised "Propellers"                  |
| 2-7           | Revised "Tachometer"                  |
| 4-1 and 4-2   | Revised "Table of Contents"           |
| 4-7 and 4-8   | Revised "Starting"                    |
| 4-9           | Shifted Material                      |
| 4-10          | Revised "Maximum Performance Climb    |
|               | (TC-2003 thru TC-2284)"               |
| 4-10A         | Add "Normal Operating Power Climb"    |
| 4-11 and 4-12 | Shifted Material                      |
| 4-26 and 4-27 | Add "Noise Characteristics"           |
| 5-1 and 5-2   | Revised "Table of Contents"           |
| 5-28          | Revised "Climb-Two Engine"            |
| 5-28A         | Add "Climb-Two Engine (TE-2285 and    |
|               | After)"                               |
| 7-1           | Revised "Table of Contents"           |
| 7-5           | Revised "Control Column"              |
| 7-6           | Shifted Material                      |
| 7-7           | Shifted Material                      |
| 7-12 and 7-13 | Revised "Brakes" and Shifted Material |
| 8-9           | Revised "Parking"                     |

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A3.....November, 1978

| Page        | Description                   |
|-------------|-------------------------------|
| Title Page  | Update                        |
| Page A (A3) | Update                        |
| 3-18        | Duplicate Information Deleted |

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BARON B55 (TC-2003 and after)  
Pilot's Operating Handbook  
and  
FAA Approved Airplane Flight Manual  
A2.....September, 1978

LOG OF REVISIONS

| Page       | Description                                  |
|------------|----------------------------------------------|
| Title Page | Update                                       |
| Page A(A1) | Update                                       |
| Page A     | Renumber Page                                |
| 1-6A       | Add "Vendor Issued STC<br>Supplements"       |
| 1-6B       | Add Blank Page                               |
| 1-10       | Rev. "McCauley Propellers"                   |
| 1-12       | Rev. "Airspeed Terminology"                  |
| 1-13       | Rev. "Airspeed Terminology"                  |
| 1-16       | Correct Typographical Errors                 |
| 2-1        | Update Table of Contents                     |
| 2-4        | Rev. "Airspeed Limitations"                  |
| 2-5        | Rev. "Fuel"                                  |
| 2-6        | Rev. "McCauley Propellers"                   |
| 2-7        | Rev. "Powerplant Instrument<br>Markings"     |
| 2-9        | Delete "Inflight Practice<br>of Vmca"        |
| 2-12       | Rev. Chart                                   |
| 2-18       | Rev. Chart                                   |
| 2-27       | Shifted Placards                             |
| 2-28       | Shifted Placards                             |
| 2-30       | Add New Placard                              |
| 3-2        | Update Table of Contents                     |
| 3-3        | Rev. "Emergency Airspeeds"                   |
| 3-9        | Correct Typographical Errors                 |
| 3-17       | Delete "Practice Demonstra-<br>tion of Vmca" |

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## LOG OF REVISIONS

| Page  | Description                                     |
|-------|-------------------------------------------------|
| 4-2   | Updated Table of Contents                       |
| 4-3   | Rev. "Speeds for Safe Operation"                |
| 4-4   | Rev. "Preflight Inspection"                     |
| 4-6   | Correct Typographical Error                     |
| 4-20  | Rev. "Ice Protection Systems"                   |
| 4-24  | Rev. "NOTE"                                     |
| 4-25  | Insert "Practice Demonstration Vmca"            |
| 4-26  | Insert "CAUTION"                                |
| 5-12  | Correct Typographical Error                     |
| 5-24  | Correct Typographical Error                     |
| 7-12  | Rev. "Brakes"                                   |
| 7-18  | Rev. "Induction Air"                            |
| 7-40  | Rev. "Propeller and Windshield Anti-Ice System" |
| 7-41  | Shifted Data                                    |
| 8-9   | Rev. "Parking"                                  |
| 8-15  | Rev. "Fuel Drains"                              |
| 8-17  | Rev. "Oil System"                               |
| 8-22  | Rev. "Propellers"                               |
| 8-24  | Rev. "Oxygen Cylinder Retesting"                |
| 8-27  | Add "CAUTION"                                   |
| 8-28  | Shifted Data                                    |
| 8-28A | Shifted Data                                    |
| 8-28B | Blank Page                                      |
| 8-29  | Rev. "Interior"                                 |

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# LOG OF REVISIONS

| Page               | Description                         |
|--------------------|-------------------------------------|
| 8-31               | Rev. "Nose Gear Retract"            |
| 8-34               | Rev. Lubrication Charts             |
| 8-35               | Rev. Lubrication Charts             |
| 8-39               | Rev. "Lubrication Schedule"         |
| 8-42               | Rev. "Consumable Materials"         |
| 8-43               | Rev. "Consumable Materials"         |
| 8-44               | Rev. "Approved Engine Oils"         |
| 8-45               | Rev. "Approved Engine Oils"         |
| 8-46               | Rev. "Bulb Replacement<br>Guide"    |
| 8-51               | Rev. "Utility Systems"              |
| 8-52               | Rev. "Flaps and Flight<br>Controls" |
| 10-1 thru<br>10-37 | Rev. "Safety Section"               |

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**Baron B55 Pilot's Operating  
Handbook and FAA Approved  
Airplane Flight Manual**

A1 ..... October, 1977

**LOG OF REVISIONS**

| Pages         | Description                             |
|---------------|-----------------------------------------|
| Title Page    | Update Title Page                       |
| Page A (A1)   | Update                                  |
| Page A        | Renumber Page                           |
| a and b       | Renumber Pages                          |
| 1-5 and 1-6   | Revise "General"                        |
| 2-25          | Add "Placard"                           |
| 5-14          | Revise "Performance"                    |
| 7-25          | Add "Partial Fuel Loading"              |
| 7-41 and 7-42 | Revise "Engine Break-In<br>Information" |
| 8-2           | Revise "Table of Contents"              |
| 8-20A         | Add "Shimmy Damper"                     |
| 8-42          | Revise "Consumable Materials"           |
| 8-46          | Revise "Bulb Replacement<br>Guide"      |

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**Baron B55 Pilot's Operating  
Handbook and FAA Approved  
Airplane Flight Manual**

Original (A).....October, 1976

**LOG OF REVISIONS**

| Pages           | Description            |
|-----------------|------------------------|
| Title Page      | Original               |
| Page A          | Original               |
| a, b, and c     | Original               |
| 1-1 thru 1-20   | Original               |
| 2-1 thru 2-30   | Original               |
| 3-1 thru 3-18   | Original               |
| 4-1 thru 4-26   | Original               |
| 5-1 thru 5-46   | Original               |
| 6-1 thru 6-22   | Original               |
| 7-1 thru 7-42   | Original               |
| 8-1 thru 8-52   | Original               |
| Section 9       | See Log of Supplements |
| 10-1 thru 10-34 | Original               |

A

**Baron B55  
Serial TC-2003 and After**

**INTRODUCTION**

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

Attention is called to Section X (SAFETY INFORMATION). BEEHCRAFT feels that it is very important to have SAFETY INFORMATION in a condensed form in the hands of the pilots. The SAFETY INFORMATION should be read and studied. Periodic review will serve as a reminder of good piloting techniques.

**WARNING**

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

Genuine BEEHCRAFT parts are produced and inspected under rigorous procedures to ensure airworthiness and suitability for use in Beech airplane applications. Parts purchased from sources other than BEEHCRAFT, 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.

**Baron B55  
Serial TC-2003 and After**

Salvaged airplane parts, reworked parts obtained from non-BEEHCRAFT 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 BEEHCRAFT, unsuitable and unsafe for airplane use.

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

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| SECTION V .....    | Performance                         |
| SECTION VI .....   | Weight and Balance/Equipment List   |
| SECTION VII .....  | Systems Description                 |
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| SECTION IX .....   | Supplements                         |
| SECTION X .....    | Safety Information                  |

# **SECTION I**

## **GENERAL**

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**INTENTIONALLY LEFT BLANK**

**THANK YOU . . .** for displaying confidence in us by selecting a BEEHCRAFT airplane. Our design engineers, assemblers and inspectors have utilized their skills and years of experience to ensure that the BEEHCRAFT Baron meets the high standards of quality and performance for which BEEHCRAFT 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 BEEHCRAFT Baron. The handbook presents suggestions and recommendations to help obtain safe and maximum performance without sacrificing economy. The BEEHCRAFT Baron must be operated according to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, and/or placards located in the airplane.

As a further reminder, the owner and operator of this airplane should also be familiar with the applicable Federal Aviation Regulations concerning operation and maintenance of the airplane and FAR Part 91 General Operating and Flight Rules. Likewise this 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 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 for the continued airworthiness of this airplane, in a condition equal to that of its original manufacture.

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

## **USE OF THE HANDBOOK**

The Pilot's Operating Handbook is designed to maintain documents necessary for the safe and efficient operation of the Baron. 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:

|                     |                                            |
|---------------------|--------------------------------------------|
| <b>Section I</b>    | <b>General</b>                             |
| <b>Section II</b>   | <b>Limitations</b>                         |
| <b>Section III</b>  | <b>Emergency Procedures</b>                |
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| <b>Section V</b>    | <b>Performance</b>                         |
| <b>Section VI</b>   | <b>Weight and Balance/Equipment List</b>   |
| <b>Section VII</b>  | <b>Systems Description</b>                 |
| <b>Section VIII</b> | <b>Handling, Servicing and Maintenance</b> |
| <b>Section IX</b>   | <b>Supplements</b>                         |
| <b>Section X</b>    | <b>Safety Information</b>                  |

### **NOTE**

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



**NOTE**

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

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

The following information may be provided to the holder of this manual automatically:

1. Original issues and revisions of Class I and Class II Service Instructions
2. Original issues and revisions of FAA Approved Airplane Flight Manual Supplements
3. Reissues and revisions of FAA Approved Airplane Flight Manuals, Flight Handbooks, Owner's Manuals, Pilot's Operating Manuals, and Pilot's Operating Handbooks

This service is free and will be provided only to holders of this handbook who are listed on the FAA Aircraft Registration Branch List or the BEECHCRAFT International Owners Notification Service List, and then only if listed by airplane serial number for the model for which this handbook is applicable. For detailed information on how to obtain "Revision Service"

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**BEEHCRAFT Baron B55**  
**Serial TC 2003 and After**

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applicable to this handbook or other BEEHCRAFT Service Publications, consult a BEEHCRAFT Aero or Aviation Center, International Distributor or Dealer, or refer to the latest revision of BEEHCRAFT Service Instructions No. 0250-010.

BEECH AIRCRAFT CORPORATION EXPRESSLY RESERVES THE RIGHT TO SUPERSEDE, CANCEL, AND/OR DECLARE OBSOLETE, WITHOUT PRIOR NOTICE, ANY PART, PART NUMBER, KIT OR PUBLICATION REFERENCED IN THIS HANDBOOK.

## **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 purposes it is the pilot's responsibility to maintain it in current status.

### **SUPPLEMENTS REVISION RECORD**

Section IX contains the supplements headed by a Log of Supplements page. On the "Log" page is a listing of the supplement equipment available for installation on the BEECHCRAFT Baron B55. When new supplements are received or existing supplements are revised, a new "Log" page will replace the previous one, since it contains a listing of all previous approvals, plus the new approval. The supplemental material will be added to the grouping in accordance with the descriptive listing.

### **NOTE**

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 probably 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.

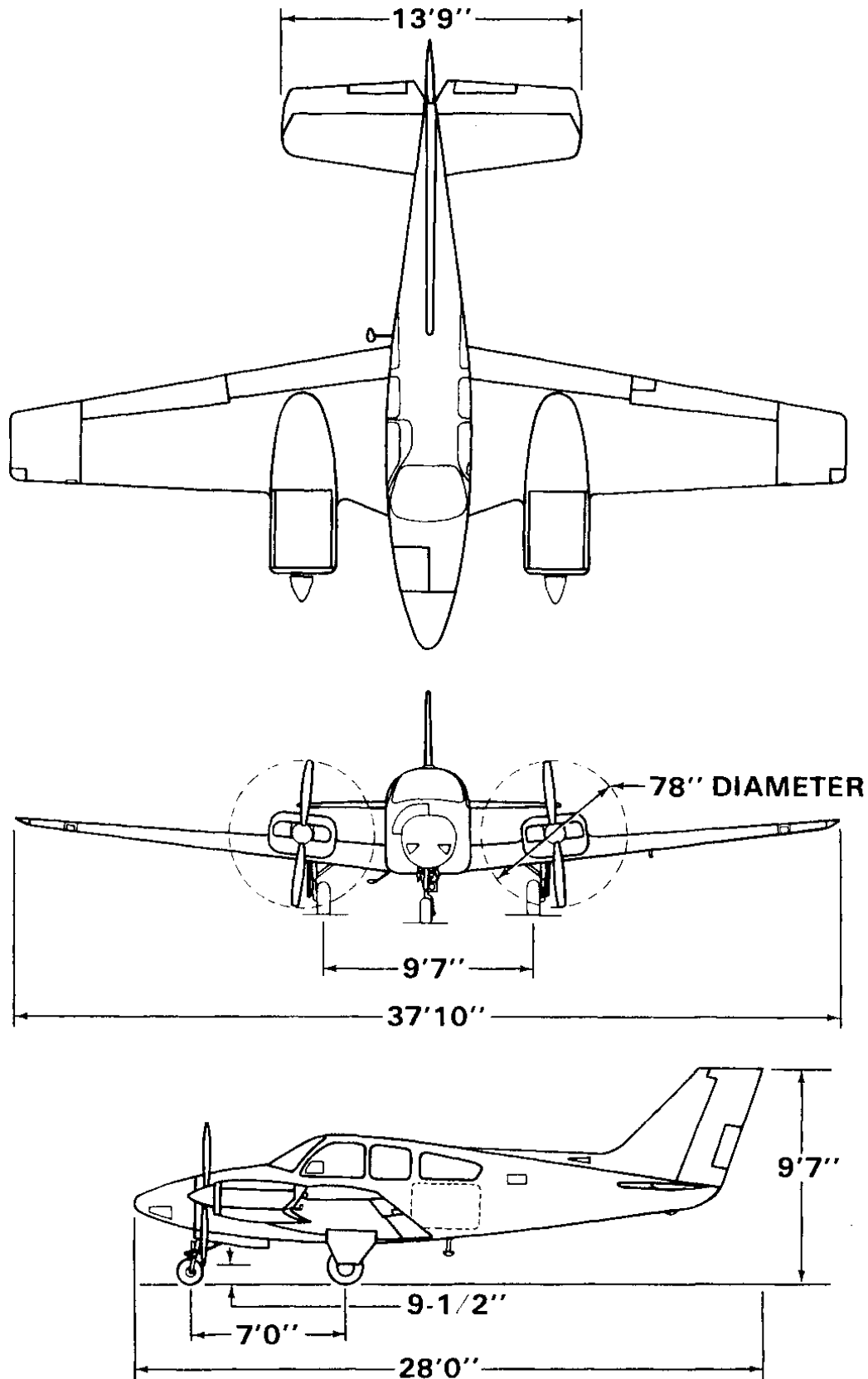
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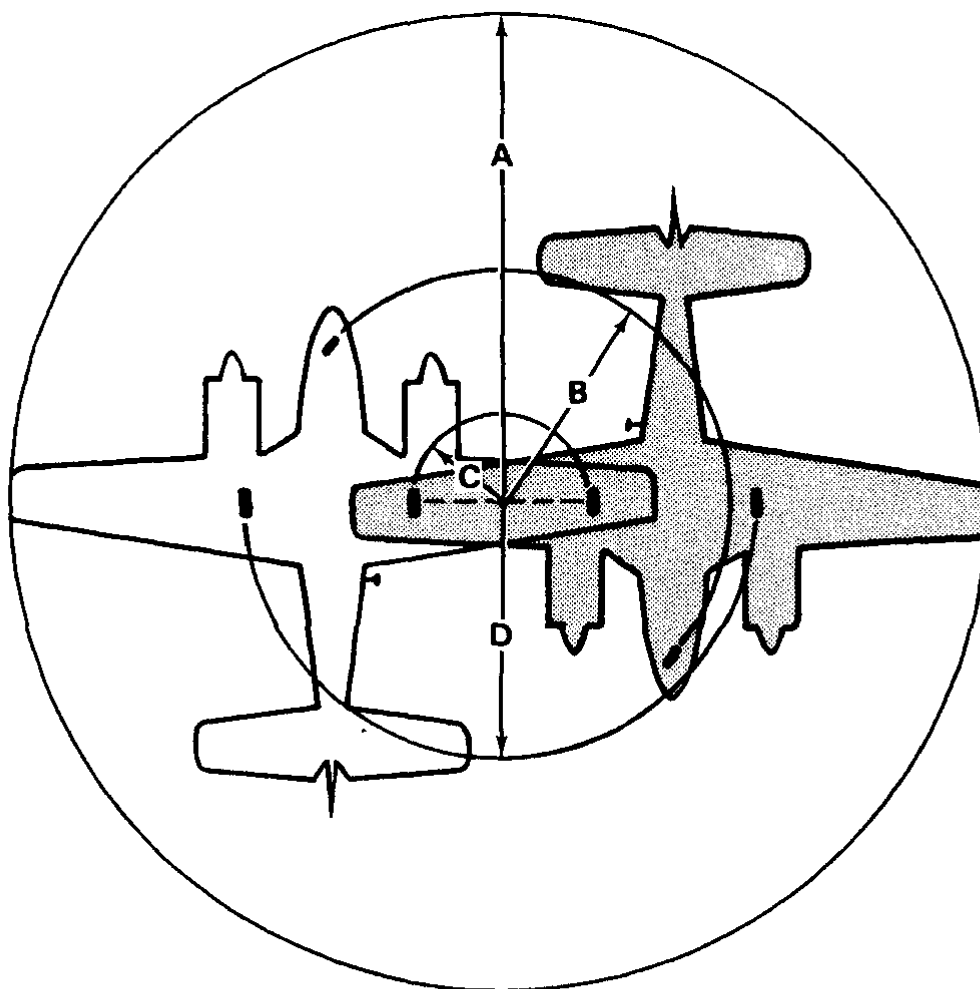
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**BEECHCRAFT Baron B55**  
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## GROUND TURNING CLEARANCE



|                                 |                  |
|---------------------------------|------------------|
| A Radius for Wing Tip .....     | 29 feet 6 inches |
| B Radius for Nose Wheel .....   | 12 feet 2 inches |
| C Radius for Inside Gear .....  | 5 feet 9 inches  |
| D Radius for Outside Gear ..... | 15 feet 7 inches |

TURNING RADII ARE PREDICATED ON THE USE OF PARTIAL BRAKING ACTION AND DIFFERENTIAL POWER.



## **DESCRIPTIVE DATA**

### **ENGINES**

Two Continental IO-470-L fuel injected, air cooled six-cylinder, horizontally opposed engines each rated at 260 horsepower at 2625 rpm.

#### **Take-off and Maximum**

Continuous Power..... Full Throttle and 2625 rpm

Maximum Normal Operating Power

(TC-2285 and After) ..... Full Throttle and 2550 rpm

Maximum One-Engine

Inoperative Power ..... Full Throttle and 2625 rpm

Cruise Climb Power ..... 25.0 in. Hg at 2500 rpm

Maximum Cruise Power ..... 24.5 in. Hg at 2450 rpm

### **PROPELLERS**

#### ***HARTZELL***

2 Blade Hubs: BHC-C2YF-2CHUF

Blades: FC8465-6

Spinner: C-2285-1P

Pitch Setting at 30 inch Station: Low 16.0°; Feathered 80.0°

Diameter: 78 inches, cut-off permitted to 76.5 inches

3 Blade Hubs: PHC-C3YF-2UF

Blades: FC7663-2R

Spinner: C-3567-1P

Pitch Setting at 30 inch Station: Low 13.5°; Feathered 84.0°

Diameter: 76 inches, cut-off permitted to 74.5 inches

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**■** *McCAULEY (TC-2003 thru TC-2284)*

2 Blade Hubs: 2AF34C55

Blades: 78FF-0

Spinner: PD-3420, PD-3462, or PD3404-3

Pitch Setting at 30 inch Station: Low 15°; high 79°

Diameter: Maximum 78 inches, minimum 76 inches

**FUEL**

**■** Aviation Gasoline 100LL (blue) or 100 (green) minimum grade; 115/145 (purple) Aviation Gasoline alternate grade.

**STANDARD SYSTEM:**

|                      |             |
|----------------------|-------------|
| Total Capacity ..... | 106 Gallons |
| Total Usable .....   | 100 Gallons |

**OPTIONAL SYSTEM:**

|                      |             |
|----------------------|-------------|
| Total Capacity ..... | 142 Gallons |
| Total Usable .....   | 136 Gallons |

**OIL**

The oil capacity is 12 quarts for each engine.

## **WEIGHTS**

### **95-B55**

|                               |          |
|-------------------------------|----------|
| Maximum Ramp Weight .....     | 5121 lbs |
| Maximum Take-Off Weight ..... | 5100 lbs |
| Maximum Landing Weight .....  | 5100 lbs |

### **95-B55A**

|                               |          |
|-------------------------------|----------|
| Maximum Ramp Weight .....     | 5011 lbs |
| Maximum Take-Off Weight ..... | 4990 lbs |
| Maximum Landing Weight .....  | 4990 lbs |

## **CABIN DIMENSIONS**

|                             |                     |
|-----------------------------|---------------------|
| Length .....                | 10 ft 1 in.         |
| Height (Max.) .....         | 4 ft 2 in.          |
| Width (Max.) .....          | 3 ft 6 in.          |
| Entrance Door .....         | 37 in. x 36 in.     |
| Standard Baggage Door ..... | 18.5 in. x 22.5 in. |
| Optional Baggage Door ..... | 38 in. x 22.5 in.   |

## **BAGGAGE**

|                                 |           |
|---------------------------------|-----------|
| Aft cabin compartment .....     | 35 cu ft  |
| Std Aft Hatshelf .....          | 1.7 cu ft |
| Extended rear compartment ..... | 10 cu ft  |
| Nose compartment .....          | 12 cu ft  |

## **SPECIFIC LOADINGS**

|                     |                |
|---------------------|----------------|
| Wing Loading .....  | 25.6 lbs/sq ft |
| Power Loading ..... | 9.8 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.

## **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 when corrected for instrument error. IAS values published in this handbook assume zero instrument error.
- TAS** True Airspeed is the airspeed of an airplane relative to undisturbed air which is the CAS corrected for altitude, temperature, and compressibility.
- V<sub>MCA</sub>** Air Minimum Control Speed is the minimum flight speed at which the airplane is directionally controllable as determined in accordance with Federal Aviation Regulations. The airplane certification conditions include one engine becoming inoperative and windmilling, a 5-degree bank towards the operative engine, take-off power on operative engine, landing gear up, flaps in take-off position, and most rearward C.G. For some conditions of weight and altitude, stall can be encountered at speeds above V<sub>MCA</sub> as established by the certification procedure described above, in which event stall speed must be regarded as the limit of effective directional control.

**$V_{SSE}$**  The intentional One-Engine-Inoperative Speed is a speed above both  $V_{MCA}$  and stall speed, selected to provide a margin of lateral and directional control when one engine is suddenly rendered inoperative. Intentional failing of one engine below this speed is not recommended.

**$V_A$**  Maneuvering Speed is the maximum speed at which application of full available aerodynamic control will not overstress the airplane.

**$V_F$**  Design flap speed is the highest speed permissible at which wing flaps may be actuated.

**$V_{FE}$**  Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position.

**$V_{LE}$**  Maximum Landing Gear Extended Speed is the maximum speed at which an airplane can be safely flown with the landing gear extended.

**$V_{LO}$**  Maximum Landing Gear Operating Speed is the maximum speed at which the landing gear can be safely extended or retracted.

**$V_{NE}$**  Never Exceed Speed is the speed limit that may not be exceeded at any time.

**$V_{NO}$**  Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air and then only with caution.  
or  **$V_C$**

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- $V_S$  Stalling Speed or the minimum steady flight speed at which the airplane is controllable.
- $V_{SO}$  Stalling Speed or the minimum steady flight speed at which the airplane is controllable in the landing configuration.
- $V_X$  Best Angle-of-Climb Speed is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance.
- $V_Y$  Best Rate-of-Climb Speed is the airspeed which delivers the greatest gain in altitude in the shortest possible time.

**METEOROLOGICAL TERMINOLOGY**

- ISA International Standard Atmosphere in which
- (1) The air is a dry perfect gas;
  - (2) The temperature at sea level is 15° Celsius (59° Fahrenheit);
  - (3) The pressure at sea level is 29.92 inches 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 sub-scale has been set to 29.92 inches of mercury (1013.2 millibars).

|                      |                                                                                                                                                                                                                                                                                                                                        |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pressure<br>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 Chart. |
| Station<br>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<br>Maximum<br>Continuous | The highest power rating not limited by time.                              |
| Cruise<br>Climb                       | Power recommended for cruise climb.                                        |
| Maximum<br>Cruise                     | The highest power settings recommended for cruise.                         |
| Recommended<br>Cruise                 | Intermediate power settings for which cruise power settings are presented. |
| Economy<br>Cruise                     | The lowest power setting for which cruise power settings are presented.    |

|                                                              |                                                                                                                                                   |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Maximum<br/>Normal<br/>Operating<br/>Power<br/>(MNOP)</b> | Highest power rating within the normal operating range. Noise characteristics requirements of FAR 36 have been demonstrated at this power rating. |
|--------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|

## **ENGINE CONTROLS AND INSTRUMENTS TERMINOLOGY**

|                                       |                                                                                                                                                                         |
|---------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Throttle<br/>Control:</b>          | The lever used to control the introduction of a fuel-air mixture into the intake passages of an engine.                                                                 |
| <b>Propeller<br/>Control</b>          | This lever requests the governor to maintain rpm at a selected value and, in the maximum decrease rpm position, feathers the propellers.                                |
| <b>Mixture<br/>Control</b>            | This lever, in the idle cut-off position, stops the flow of fuel at the injectors and in the intermediate thru the full rich positions, regulates the fuel air mixture. |
| <b>Propeller<br/>Governors</b>        | The governors maintain the selected rpm requested by the propeller control levers.                                                                                      |
| <b>Manifold<br/>Pressure<br/>Gage</b> | An instrument that measures the absolute pressure in the intake manifold of an engine, expressed in inches of mercury (in. Hg).                                         |
| <b>Tachometer</b>                     | An instrument that indicates the rotational speed of the propeller (and engine) in revolutions per minute (rpm).                                                        |



**AIRPLANE PERFORMANCE AND  
FLIGHT PLANNING TERMINOLOGY**

|                                       |                                                                                                                                                                                                                                                                                 |
|---------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Climb<br>Gradient                     | The ratio of the change<br>in height during a portion of a climb,<br>to the horizontal distance traversed<br>in the same time interval.                                                                                                                                         |
| Demonstrated<br>Crosswind<br>Velocity | The demonstrated crosswind velocity<br>is the velocity of the crosswind com-<br>ponent for which adequate control of<br>the airplane during take-off and land-<br>ing was actually demonstrated during<br>certification tests. The value shown<br>is considered to be limiting. |
| Accelerate-<br>Stop Distance          | The distance required to accelerate to<br>a specified speed and, assuming<br>failure of an engine at the instant that<br>speed is attained, to bring the airplane<br>to a stop.                                                                                                 |
| Accelerate-<br>Go Distance            | The distance required to accelerate to<br>a specified speed and, assuming<br>failure of an engine at the instant that<br>speed is attained, feather inoperative<br>propeller and continue takeoff on the<br>remaining engine to a height of 50 feet.                            |
| MEA                                   | Minimum enroute IFR altitude.                                                                                                                                                                                                                                                   |
| Route<br>Segment                      | A part of a route. Each end of that<br>part is identified by: (1) a geograph-<br>ical location; or (2) a point at which<br>a definite radio fix can be established.                                                                                                             |
| GPH                                   | U.S. Gallons 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.                                                                                                                                         |

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**Section I**  
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|                         |                                                                                                       |
|-------------------------|-------------------------------------------------------------------------------------------------------|
| 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 ramp weight 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.                                                                      |

**Section I**  
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**Serial TC 2003 and After**

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## **SECTION II**

### **LIMITATIONS**

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

### **AIRSPEED LIMITATIONS**

| <b>SPEED</b>                                                                                      | <b>CAS<br/>KNOTS</b> | <b>IAS<br/>KNOTS</b> | <b>REMARKS</b>                                                            |
|---------------------------------------------------------------------------------------------------|----------------------|----------------------|---------------------------------------------------------------------------|
| Never Exceed<br>$V_{NE}$                                                                          | 223                  | 224                  | Do not exceed this speed in any operation                                 |
| Maximum Structural Cruising<br>$V_{NO}$ or $V_C$                                                  | 182                  | 183                  | Do not exceed this speed except in smooth air and then only with caution  |
| Maneuvering<br>$V_A$                                                                              | 156                  | 157                  | Do not make full or abrupt control movements above this speed             |
| Maximum Flap Extension/<br>Extended $V_{FE}$<br>(Approach $15^\circ$ )<br>(Full Down $30^\circ$ ) | 152<br>122           | 153<br>122           | Do not extend flaps or operate with flaps extended above this speed       |
| Maximum Landing Gear Operating/<br>Extended<br>$V_{LO}$ and $V_{LE}$                              | 152                  | 153                  | Do not extend, retract or operate with gear extended above this speed     |
| Air Minimum Control Speed $V_{MCA}$                                                               | 80                   | 78                   | Minimum speed for directional controllability after sudden loss of engine |

**\*AIRSPEED INDICATOR MARKINGS**

| <b>MARKING</b>   | <b>CAS<br/>KNOTS</b> | <b>IAS<br/>KNOTS</b> | <b>SIGNIFICANCE</b>                               |
|------------------|----------------------|----------------------|---------------------------------------------------|
| White Arc        | 72-122               | 73-122               | Full Flap Operating Range                         |
| White Triangle** | 153                  | 152                  | Maximum Flap Approach Position 15°                |
| Blue Radial      | 100                  | 99                   | Single-Engine Best Rate-of-Climb Speed            |
| Red Radial       | 80                   | 78                   | Minimum Single-Engine Control (V <sub>MCA</sub> ) |
| Green Arc        | 76-182               | 79-183               | Normal Operating Range                            |
| Yellow Arc       | 182-223              | 183-224              | Operate with caution, only in smooth air          |
| Red Radial       | 223                  | 224                  | Maximum speed for ALL operations                  |

\*The Airspeed Indicator is marked in IAS values

■ \*\*Series TC-2276 and After



## **POWER PLANT LIMITATIONS**

### **ENGINES**

Two Continental IO-470-L fuel injected, air cooled six-cylinder, horizontally opposed engines each rated at 260 horsepower at 2625 rpm.

#### **Take-off and Maximum**

Continuous Power..... Full Throttle and 2625 rpm

#### **Maximum Normal Operating**

Power (TC-2285 and after)..... Full Throttle and 2550 rpm

Maximum Cylinder Head Temperature ..... 460 °F

Maximum Oil Temperature ..... 225 °F

Minimum Take-off Oil Temperature ..... 75 °F

Minimum Oil Pressure (Idle)..... 30 psi

Maximum Oil Pressure..... 80 psi

### **FUEL**

Aviation Gasoline 100LL (blue) or 100 (green) minimum grade; 115/145 (purple) Aviation Gasoline alternate grade.

### **OIL**

Ashless dispersant oils must meet Continental Motors Corporation Specification MHS-24B. Refer to APPROVED ENGINE OILS, Servicing Section.

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**PROPELLERS**

*HARTZELL*

2 Blade Hubs: BHC-C2YF-2CHUF

Blades: FC8465-6

Spinner: C-2285-6P

Pitch Setting at 30 inch Station: Low 16.0°; Feathered 80.0°

Diameter: 78 inches, cut-off permitted to 76.5 inches

3 Blade Hubs: PHC-C3YF-2UF

Blades: FC7663-2R

Spinner: C-3567-1P

Pitch Setting at 30 inch Station: Low 13.5°; Feathered 84.0°

Diameter: 76 inches, cut-off permitted to 74.5 inches

*McCAULEY (TC-2003 thru TC-2284)*

2 Blade Hubs: 2AF34C55

Blades: 78FF-0

Spinner: PD-3420, PD-3462, or PD3404-3

Pitch Setting at 30 inch Station: Low 15°; high 79°

Diameter: Maximum 78 inches, minimum 76 inches

**STARTERS - TIME FOR CRANKING**

Do not operate starter continuously for more than 30 seconds. Allow starter to cool again before cranking.

**POWER PLANT INSTRUMENT MARKINGS**

**OIL TEMPERATURE**

Caution (Yellow Radial)..... 75°F

Operating Range (Green Arc) ..... 75° to 225°F

Maximum (Red Radial)..... 225°F

**OIL PRESSURE**

Minimum Pressure (Red Radial) ..... 30 psi  
Operating Range (Green Arc) ..... 30 to 60 psi  
Maximum Pressure (Red Radial) ..... 80 psi

**FUEL FLOW AND PRESSURE**

**Serials TC-2003 thru TC-2354:**

Minimum (Red Radial)..... 1.5 psi  
Operating Range (Green Arc) ..... 1.5 psi to 20.6 gph  
Cruise Power  
(Sawtooth Green Arc) ..... 8.8 to 15.4 gph  
Take-off and Climb Power  
(Sawtooth Green Arc) ..... 17.5 to 20.6 gph  
Maximum (Red Radial)..... 17.5 psi

**FUEL FLOW**

**Serials TC-2355 and after:**

Operating Range (Green Arc) ..... 3.0 to 21.7 gph  
Take-off and Climb Power  
(White Radials) ..... 17.7 to 20.6 gph  
Maximum (Red Radial)..... 21.7 gph

**MANIFOLD PRESSURE**

Operating Range (Green Arc) ..... 15 to 29.6 in. Hg  
Maximum (Red Radial)..... 29.6 in. Hg

**TACHOMETER**

Operating Range (Green Arc)  
(Serials TC-2003 thru TC-2284) ..... 2000 to 2625 rpm  
Operating Range (Green Arc)  
(Serials TC-2285 and After) ..... 2000 to 2550 rpm  
Maximum (Red Radial)..... 2625 rpm

**CYLINDER HEAD TEMPERATURE**

Operating Range (Green Arc) ..... 200° to 460°F  
Maximum (Red Radial)..... 460°F

**MISCELLANEOUS INSTRUMENT MARKINGS**

**INSTRUMENT PRESSURE**

Normal (Green Arc) ..... 4.3 to 5.9 in. Hg  
Red Button Source Failure  
Indicators

**PROPELLER DEICE AMMETER**

Normal Operating Range  
(Green Arc) ..... 7 to 12 amps (2 blade)  
Normal Operating Range  
(Green Arc) ..... 14 to 18 amps (3 blade)

**FUEL QUANTITY**

Yellow Arc ..... E to 1/8 Full

**WEIGHTS**

**95-B55**

Maximum Ramp Weight ..... 5121 lbs  
Maximum Take-Off Weight ..... 5100 lbs  
Maximum Landing Weight ..... 5100 lbs

**95-B55A**

Maximum Ramp Weight ..... 5011 lbs  
Maximum Take-Off Weight ..... 4990 lbs  
Maximum Landing Weight ..... 4990 lbs

**Maximum Baggage/Cargo Compartment Weights:**

Aft Cabin compartment  
(less occupants and equipment) ..... 400 lbs  
Extended Rear Compartment ..... 120 lbs  
Nose Compartment (baggage less  
equipment) ..... 300 lbs

Refer to Weight and Balance section for additional  
information.

## **CG LIMITS**

### *Baron 95-B55*

Forward Limits: 74 inches aft of datum at 3800 lbs and under, then straight line variation to 77.5 inches aft of datum at 4740 lbs, then straight line variation to 81.0 inches aft of datum at gross weight of 5100 lbs.

Aft Limits: 86 inches aft of datum at all weights.

### *Baron 95-B55A*

Forward Limits: 74 inches aft of datum at 3800 lbs and under, then straight line variation to 77.5 inches aft of datum at 4740 lbs, then straight line variation to 79.9 inches aft of datum at gross weight of 4990 lbs.

Aft Limits: 86 inches aft of datum at all weights.

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

MAC leading edge is 67.2 inches aft of datum.

MAC length is 63.1 inches.

## **MANEUVERS**

This is a normal category airplane. Acrobatic maneuvers, including spins, are prohibited.

**FLIGHT LOAD FACTORS (5100 POUNDS)**

Positive maneuvering load factors:

Flaps Up ..... 4.4G

Negative maneuvering load factor:

Flaps Up ..... 3.0G

**MINIMUM FLIGHT CREW** ..... One pilot

**KINDS OF OPERATION**

This airplane is approved for the following type operations when the required equipment is installed and operational as defined herein:

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

**REQUIRED EQUIPMENT FOR VARIOUS  
CONDITIONS OF FLIGHT**

Federal Aviation Regulations (23.785, 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 aircraft such as galley equipment, 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**

Ice protection equipment which may be installed on this airplane has not been demonstrated to meet requirements for flight into known icing conditions.

| SYSTEM<br>and/or<br>COMPONENT                                      | Number Installed |   |   |   |   | Remarks and/or Exceptions                                                                    |
|--------------------------------------------------------------------|------------------|---|---|---|---|----------------------------------------------------------------------------------------------|
|                                                                    | VFR Day          |   |   |   |   |                                                                                              |
|                                                                    | VFR Night        |   |   |   |   |                                                                                              |
|                                                                    | IFR Day          |   |   |   |   |                                                                                              |
|                                                                    | IFR Night        |   |   |   |   |                                                                                              |
| <b>GENERAL</b>                                                     |                  |   |   |   |   |                                                                                              |
| Overwater flight                                                   | *                | * | * | * | * | -*Per FAR 91.33                                                                              |
| <b>ATA 100 CHAPTER 23<br/>COMMUNICATIONS</b>                       |                  |   |   |   |   |                                                                                              |
| VHF communications<br>system                                       | *                | * | * | * | * | -*Per FAR 91.33                                                                              |
| <b>ATA 100 CHAPTER 24<br/>ELECTRICAL POWER</b>                     |                  |   |   |   |   |                                                                                              |
| Battery                                                            | 1                | 1 | 1 | 1 | 1 | -                                                                                            |
| DC alternator/generator                                            | 2                | 1 | 2 | 2 | 2 | -                                                                                            |
| DC loadmeter                                                       | 2                | 2 | 2 | 2 | 2 | -                                                                                            |
| Alternator-out light                                               | 2                | 2 | 2 | 2 | 2 | - One may be inoperative providing<br>corresponding loadmeter is operative<br>and monitored. |
| Starter Energized<br>Warning light (TC-2340,<br>TC-2355 and after) | 1                | 1 | 1 | 1 | 1 | - May be inoperative provided both<br>loadmeters are operative and<br>monitored.             |

Section II  
LimitationsBEECHCRAFT Baron B55  
Serial TC 2003 and After



|                                                            |   |   |   |   |   |                                                                                                                                                              |
|------------------------------------------------------------|---|---|---|---|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>ATA 100 CHAPTER 25<br/>EQUIPMENT AND<br/>FURNISHING</b> |   |   |   |   |   |                                                                                                                                                              |
| Seat belts and<br>shoulder harness                         | * | * | * | * | * | - *Per FAR 91.33, all seats                                                                                                                                  |
| Emergency locator trans-<br>mitter                         | 1 | 1 | 1 | 1 | 1 | - Per FAR 91.52                                                                                                                                              |
| <b>ATA 100 CHAPTER 26<br/>FIRE PROTECTION</b>              |   |   |   |   |   |                                                                                                                                                              |
| Portable fire extinguisher                                 | * | * | * | * | * | - *Optional                                                                                                                                                  |
| <b>ATA 100 CHAPTER 27<br/>FLIGHT CONTROLS</b>              |   |   |   |   |   |                                                                                                                                                              |
| Trim tab indicators -<br>Rudder aileron, and<br>elevator   | 3 | 3 | 3 | 3 | 3 | - May be inoperative providing that<br>tabs are visually checked in the<br>neutral position prior to take-off<br>and checked for full range of<br>operation. |
| Flap position indicator                                    | 1 | 1 | 1 | 1 | 1 | - May be inoperative providing flap<br>travel is visually inspected prior<br>to take-off.                                                                    |
| Stall warning                                              | 1 | 1 | 1 | 1 | 1 |                                                                                                                                                              |

| SYSTEM<br>and/or<br>COMPONENT        | Number Installed |   |   |   |   | Remarks and/or Exceptions                                                                                                                           |
|--------------------------------------|------------------|---|---|---|---|-----------------------------------------------------------------------------------------------------------------------------------------------------|
|                                      | VFR Day          |   |   |   |   |                                                                                                                                                     |
|                                      | VFR Night        |   |   |   |   |                                                                                                                                                     |
|                                      | IFR Day          |   |   |   |   |                                                                                                                                                     |
|                                      | IFR Night        |   |   |   |   |                                                                                                                                                     |
| ATA 100 CHAPTER 28<br>FUEL EQUIPMENT |                  |   |   |   |   |                                                                                                                                                     |
| Engine driven fuel pump              | 2                | 2 | 2 | 2 | 2 | -                                                                                                                                                   |
| Electrically driven aux fuel pump    | 2                | 2 | 2 | 2 | 2 | -                                                                                                                                                   |
| Fuel quantity indicator              | 2                | 2 | 2 | 2 | 2 | - One may be inoperative providing other side is operational and amount of fuel on board can be established to be adequate for the intended flight. |
| Fuel flow indicator                  | 1                | 1 | 1 | 1 | 1 | - Dual indicating                                                                                                                                   |

|                                                           |      |   |   |   |   |                                                                                                           |
|-----------------------------------------------------------|------|---|---|---|---|-----------------------------------------------------------------------------------------------------------|
| <b>ATA 100 CHAPTER 30<br/>ICE AND RAIN<br/>PROTECTION</b> |      |   |   |   |   |                                                                                                           |
| Alternate static air source                               | 1    | - | - | 1 | 1 | -                                                                                                         |
| Pitot heater                                              | 1(2) | - | - | 1 | 1 | -                                                                                                         |
| Heated fuel vent                                          | 2    | - | - | 2 | 2 | -                                                                                                         |
| <b>ATA 100 CHAPTER 32<br/>LANDING GEAR</b>                |      |   |   |   |   |                                                                                                           |
| Landing gear motor                                        | 1    | 1 | 1 | 1 | 1 | - May be inoperative provided operations are continued only to a point where repairs can be accomplished. |
| Landing gear position indication lights                   | 4    | 4 | 4 | 4 | 4 |                                                                                                           |
| Landing gear aural warning horn                           | 1    | 1 | 1 | 1 | 1 |                                                                                                           |

| SYSTEM<br>and/or<br>COMPONENT    | Number Installed |   |   |   |   | Remarks and/or Exceptions                                 |
|----------------------------------|------------------|---|---|---|---|-----------------------------------------------------------|
|                                  | VFR Day          |   |   |   |   |                                                           |
|                                  | VFR Night        |   |   |   |   |                                                           |
|                                  | IFR Day          |   |   |   |   |                                                           |
|                                  | IFR Night        |   |   |   |   |                                                           |
| ATA 100 CHAPTER 33<br>LIGHTS     |                  |   |   |   |   |                                                           |
| Cockpit and instrument<br>lights | *                | - | * | - | * | -*Lights must illuminate all<br>instruments and controls. |
| Taxi light                       | 1                | - | - | - | - |                                                           |
| Landing light                    | 2                | - | * | - | * | -*Per FAR 91.33                                           |
| Rotating beacon                  | 1(2)             | - | 1 | - | 1 | - Top beacon must be operative                            |
| Strobe light                     | 3                | - | - | - | - |                                                           |
| Position light                   | 3                | - | 3 | - | 3 |                                                           |

|                              |   |   |   |   |   |                               |
|------------------------------|---|---|---|---|---|-------------------------------|
| <b>ATA 100 CHAPTER 34</b>    |   |   |   |   |   |                               |
| <b>NAVIGATION</b>            |   |   |   |   |   |                               |
| <b>INSTRUMENTS</b>           |   |   |   |   |   |                               |
| Altimeter                    | 1 | 1 | 1 | 1 | 1 | -                             |
| Airspeed indicator           | 1 | 1 | 1 | 1 | 1 | -                             |
| Vertical speed               | 1 | - | - | - | - | -                             |
| Magnetic compass             | 1 | 1 | 1 | 1 | 1 | -                             |
| Attitude indicator           | 1 | - | - | 1 | 1 | -                             |
| Turn and slip indicator      | 1 | - | - | 1 | 1 | -                             |
| Directional gyro             | 1 | - | - | 1 | 1 | -                             |
| Clock                        | 1 | - | - | 1 | 1 | -                             |
| Transponder                  | * | * | * | * | * | -*Per FAR 91.24, 91.90, 91.97 |
| Distance measuring equipment | * | * | * | * | * | -*Per FAR 91.33               |
| Navigation equipment         | * | - | - | * | * | -*Per FAR 91.33               |
| <b>ATA 100 CHAPTER 35</b>    |   |   |   |   |   |                               |
| <b>OXYGEN</b>                |   |   |   |   |   |                               |
| Oxygen system                | - | * | * | * | * | -*Per FAR 91.32               |

| SYSTEM<br>and/or<br>COMPONENT                               | Number Installed |   |   |   |   | Remarks and/or Exceptions                                |
|-------------------------------------------------------------|------------------|---|---|---|---|----------------------------------------------------------|
|                                                             | VFR Day          |   |   |   |   |                                                          |
|                                                             | VFR Night        |   |   |   |   |                                                          |
|                                                             | IFR Day          |   |   |   |   |                                                          |
|                                                             | IFR Night        |   |   |   |   |                                                          |
| <b>ATA 100 CHAPTER 37<br/>VACUUM</b>                        |                  |   |   |   |   |                                                          |
| Instrument air source                                       | 2                | - | 2 | 2 | 2 | -                                                        |
| Instrument air indicator                                    | 1                | 1 | 1 | 1 | 1 | - Dual indicating                                        |
| Deicing pressure indicator                                  | 1                | * | * | * | * | -*One required with optional surface deice installation. |
| <b>ATA 100 CHAPTER 77<br/>ENGINE INDICATING INSTRUMENTS</b> |                  |   |   |   |   |                                                          |
| Engine tachometer                                           | 1                | 1 | 1 | 1 | 1 | - Dual indicating                                        |
| Manifold pressure indicator                                 | 1                | 1 | 1 | 1 | 1 | - Dual indicating                                        |
| Cylinder head temp gage                                     | 2                | 2 | 2 | 2 | 2 | -                                                        |

|                                                                                                                                 |   |   |   |
|---------------------------------------------------------------------------------------------------------------------------------|---|---|---|
| <b>ATA 100 CHAPTER 79</b><br><b>ENGINE OIL</b><br><b>INSTRUMENTS</b><br><br>Oil pressure indicator<br>Oil temperature indicator | 2 | 2 | - |
|                                                                                                                                 | 2 | 2 | - |
|                                                                                                                                 | 2 | 2 |   |
|                                                                                                                                 | 2 | 2 |   |
|                                                                                                                                 | 2 | 2 |   |
|                                                                                                                                 | 2 | 2 |   |
|                                                                                                                                 | 2 | 2 |   |

**Section II**  
**Limitations**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

**FUEL**

*TOTAL FUEL with left and right wing fuel systems full:*

**Standard Fuel System**

|                |             |
|----------------|-------------|
| Capacity ..... | 106 Gallons |
| Usable .....   | 100 Gallons |

**Optional Fuel System**

|                |             |
|----------------|-------------|
| Capacity ..... | 142 Gallons |
| Usable .....   | 136 Gallons |

Do not take off if Fuel Quantity Gages indicate in Yellow Arc or with less than 13 gallons in each wing fuel system.

The fuel crossfeed system to be used during emergency conditions in level flight only.

Maximum slip duration: 30 seconds

**OXYGEN REQUIREMENTS**

One mask for minimum crew and one mask passengers with an adequate supply of oxygen when operating above 12,500 feet (MSL). Refer to FAR 91.32 for variations concerning supplemental oxygen requirements for a particular flight.

**MAXIMUM PASSENGER SEATING  
CONFIGURATION**

Five (5) passengers and one (1) pilot

**SEATING**

All occupied seats must be in the upright position for take-off and landing.



**Temporary Change  
to the  
Pilot's Operating Handbook  
and  
FAA Approved Airplane Flight Manual  
P/N 96-590011-17TC1**

|                                         |                                                                                                                                                                                                                   |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Publication Affected</b>             | 95-B55 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (P/N 96-590011-17, Issued October, 1976 or Subsequent)                                                                                  |
| <b>Airplane Serial Numbers Affected</b> | TC-2003 and After                                                                                                                                                                                                 |
| <b>Description of Change</b>            | The addition of a placard to the fuel selectors to warn of the no-flow condition that exists between the fuel selector detents.                                                                                   |
| <b>Filing Instructions</b>              | Insert this temporary change into the 95-B55 Pilot's Operating Handbook and FAA Approved Airplane Flight Manual immediately following page 2-20 (Section II, LIMITATIONS) and retain until rescinded or replaced. |

## LIMITATIONS

### PLACARDS

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

**WARNING - POSITION SELECTORS IN DETENTS ONLY -  
NO FUEL FLOW TO ENGINES BETWEEN DETENTS**

Approved:

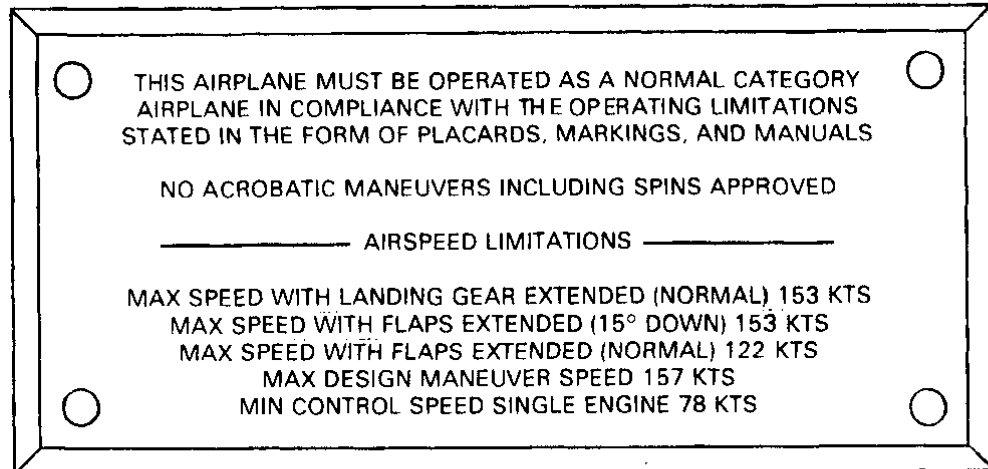


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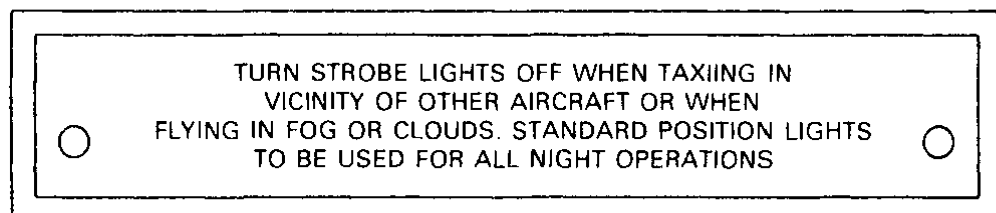
A.C. Jackson  
Raytheon Aircraft Company  
DOA CE-2

**PLACARDS**

*Below Ignition Switch Panel:*



*On Left Side Panel:*



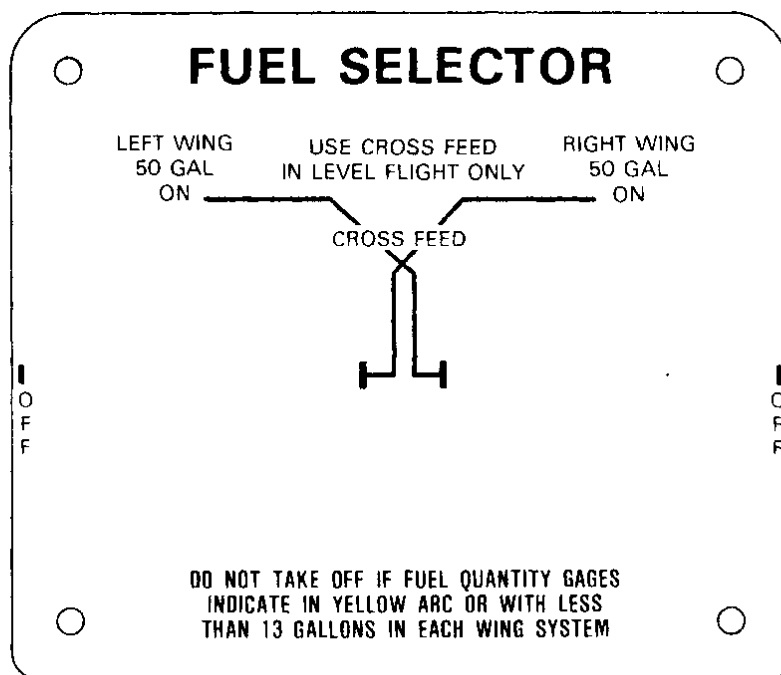
**Section II**  
**Limitations**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

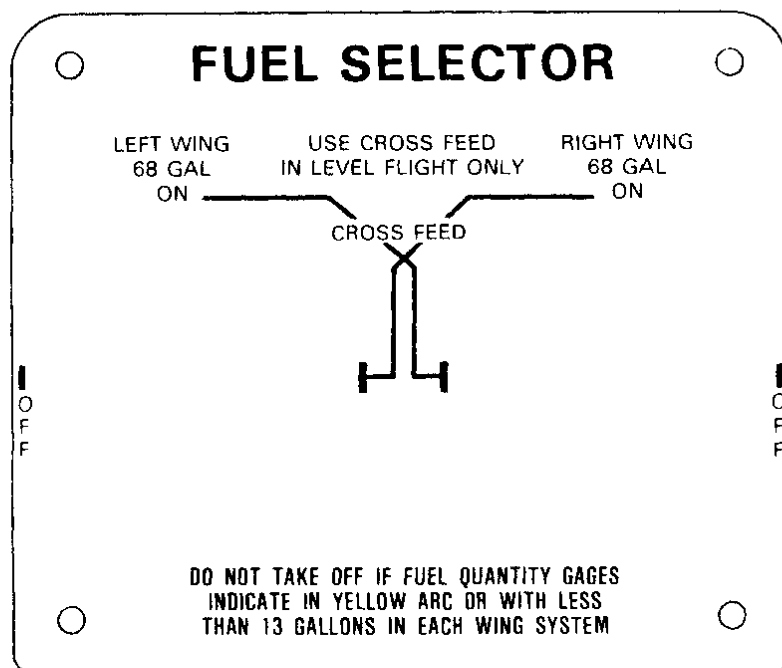
**PLACARDS (Cont'd)**

*Between Fuel Selector Handles:*

*Standard 100 Gallon System*



*Optional 136 Gallon System*



*On Top of Front Spar Carry-Thru Structure Between Front Seats:*

**EMERGENCY  
LANDING GEAR  
INSTRUCTIONS  
TO EXTEND**

ENGAGE HANDLE IN REAR  
OF FRONT SEAT AND TURN  
COUNTERCLOCKWISE AS FAR  
AS POSSIBLE (50 TURNS)

*On Emergency Crank Access Cover:*

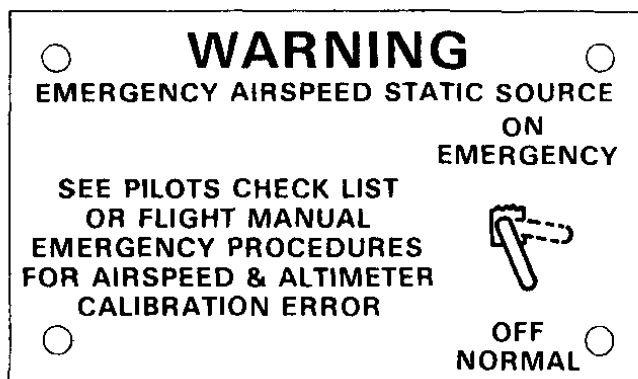
**LANDING GEAR  
EMERGENCY CRANK**

**PULL OUT**

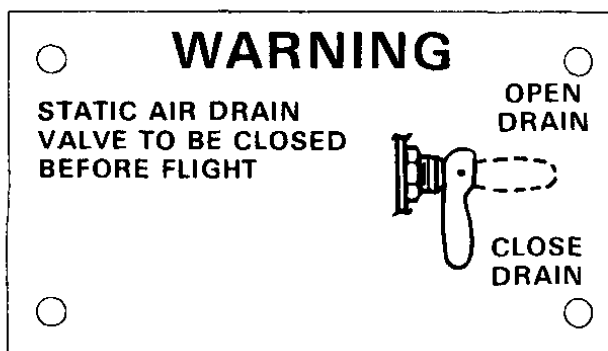
**LIFT UP**

**PLACARDS (Cont'd)**

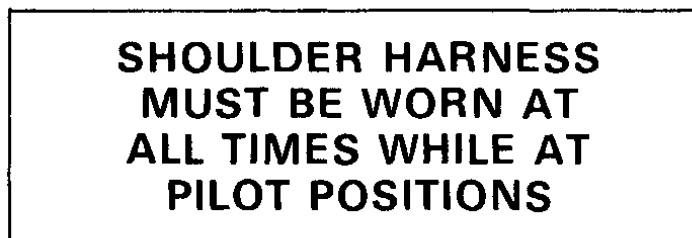
*On Lower Sidewall Adjacent to Pilot:*



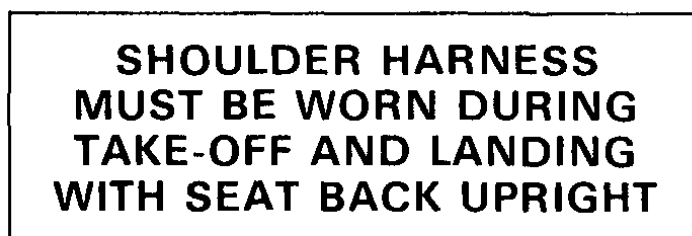
**OR**



*On Windows Adjacent to Pilot's and Copilot's Seat:*



*On Windows Adjacent to 3rd, 4th, 5th and 6th Seats:*



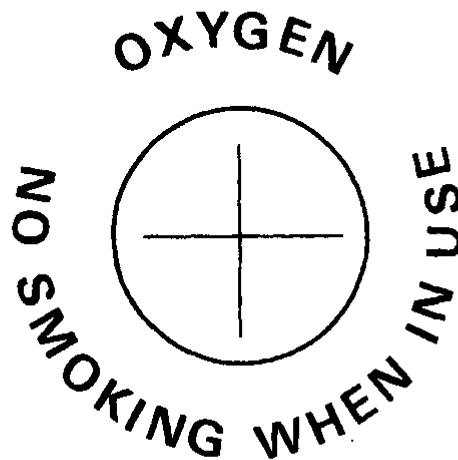
**BEECHCRAFT Baron B55  
Serial TC 2003 and After**

**Section II  
Limitations**

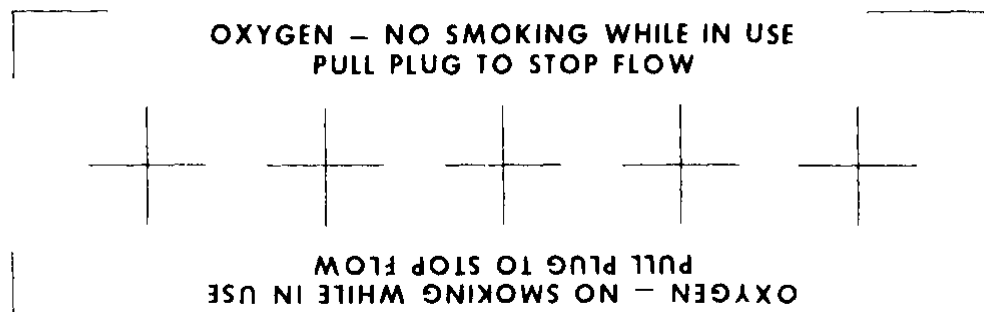
*On Oxygen Console:*

**OXYGEN  
NO SMOKING WHEN IN USE  
HOSE PLUG MUST BE PULLED OUT TO STOP OXYGEN FLOW**

*On Each Passenger Outlet (Serials TC-2003 thru TC-2354, except TC-2340) and On All Pilot and Copilot Outlets (All Serials):*



*On Oxygen Manifold (Serials TC-2340, TC-2355 and after):*

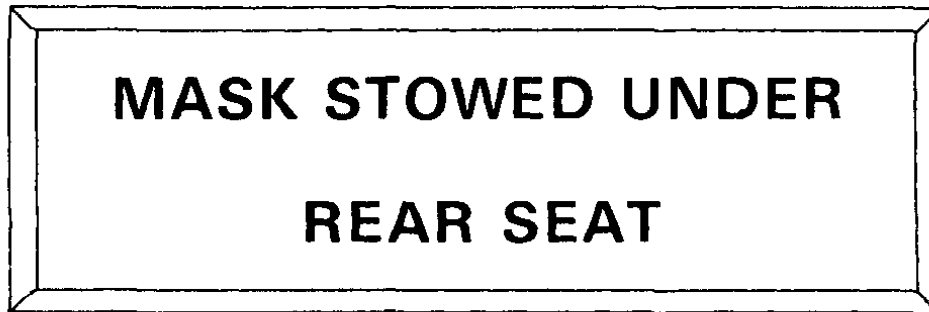


*On Each Oxygen Mask Stowage Container:*

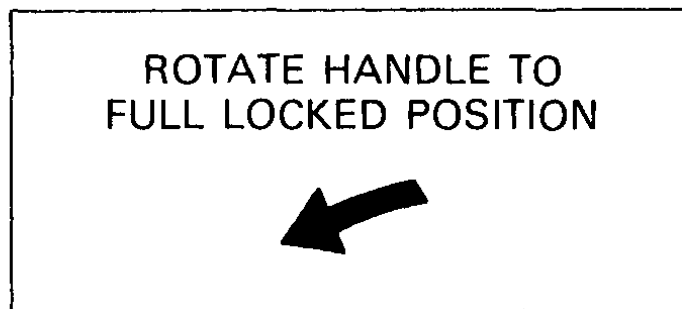
**OXYGEN MASK**

**PLACARDS (Cont'd)**

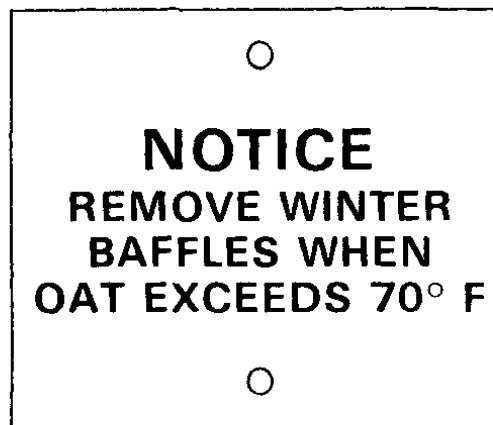
*Adjacent to Oxygen Outlet When 5th & 6th Seats Are Installed:*



*Adjacent To Cabin Door Handle:*



**■** *On Lower Console Below Cowl Flap Levers:*





*On Instrument Panel When Anti-Collision Lights Are Not Installed:*

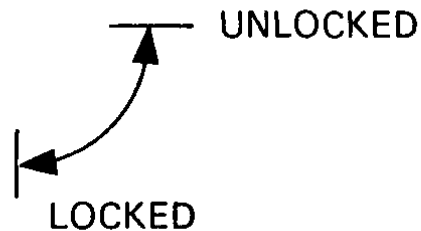
**THIS AIRCRAFT NOT FULLY  
EQUIPPED FOR NIGHT FLIGHT**

*On Openable Cabin Windows:*

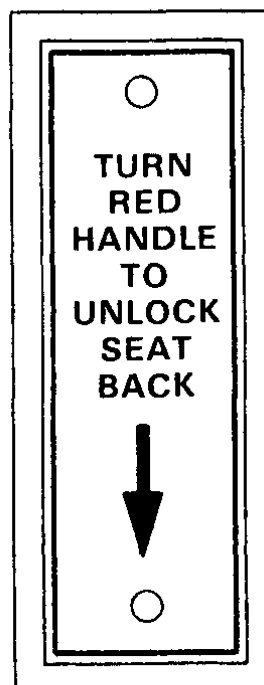
**DO NOT OPEN  
IN FLIGHT**

**LATCH WINDOW  
BEFORE TAKE-OFF**

*Adjacent to Middle Window Handles (Serials TC-2431 and after):*



*On Inboard Side Of Seat Backs For 3rd And 4th Seats:*



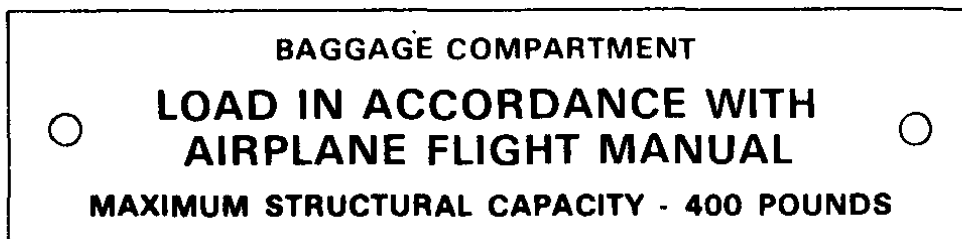
**Section II**  
**Limitations**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

**PLACARDS (Cont'd)**

*On Inside Rear Baggage Compartment Door:*

*Standard Baggage Compartment*



*On Inside Rear Baggage Compartment Door:*

*Optional Extended Baggage Compartment*



*In Plain View When Nose Baggage Compartment Door Is Open:*



*On Hat Shelf:*

**HAT SHELF  
NO HEAVY OBJECTS**

*On Control Lock*

## **INSTALLATION INSTRUCTIONS**

**INSTALL OTHER SIDE FACING PILOT**

- 1. CLOSE THROTTLES, INSTALL PIN BETWEEN LEVERS, THROUGH COLLAR LOCK & CONTROL COLUMN. (ROTATE CONTROL WHEEL APPROX 12° TO THE RIGHT)**
- 2. ROUTE CABLE & RUDDER LOCK AROUND RIGHT SIDE OF CONTROL COLUMN, POSITION PEDALS IN AFT POSITION & INSTALL LOCK IN RUDDER PEDALS.**

**CONTROLS LOCKED  
REMOVE BEFORE  
FLIGHT**

**Section II  
Limitations**

**BEEHCRAFT Baron B55  
Serial TC 2003 and After**

*Below Left and Right Middle Windows after compliance  
with BEEHCRAFT Service Instructions 1241:*

*(Serials TC-2003 thru TC-2354, Except TC-2340):*

**EMERGENCY EXIT  
LIFT LATCH - PULL PIN  
PUSH WINDOW OUT**

*On Face of Emergency Exit Latch Cover (Serials TC-2340,  
TC-2355 and after):*

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

*On Emergency Exit Handle (Serials TC-2340, TC-2355 and after):*

**ROTATE HANDLE UP**  
**BREAKING SAFETY**  
**WIRE**  
**PUSH WINDOW OUT**

## **SECTION III**

# **EMERGENCY PROCEDURES**

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

### **EMERGENCY AIRSPEEDS (5100 LBS)**

|                                               |         |
|-----------------------------------------------|---------|
| One-Engine-Inoperative Best                   |         |
| Angle-of-Climb ( $V_X$ ) .....                | 91 kts  |
| One-Engine-Inoperative Best                   |         |
| Rate-of-Climb ( $V_Y$ ) .....                 | 99 kts  |
| Air Minimum Control Speed ( $V_{MCA}$ ) ..... | 78 kts  |
| One-Engine-Inoperative Enroute Climb .....    | 99 kts  |
| Emergency Descent .....                       | 153 kts |
| One-Engine-Inoperative Landing:               |         |
| Maneuvering to Final Approach .....           | 99 kts  |
| Final Approach (Flaps Down) .....             | 90 kts  |
| Intentional One-Engine-Inoperative            |         |
| Speed ( $V_{SSE}$ ) .....                     | 84 kts  |
| Maximum Glide Range .....                     | 120 kts |

*The stall warning horn is inoperative when the battery and generator/alternator switches are 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. In order to supply one safe speed for each type of emergency situation, the airspeeds presented were derived at 5100 lbs.

### **ONE ENGINE OPERATION**

Two major factors govern one engine operations; airspeed and directional control. The airplane can be safely maneu-



vered or trimmed for normal hands-off operation and sustained in this configuration by the operative engine AS LONG AS SUFFICIENT AIRSPEED IS MAINTAINED.

## **DETERMINING INOPERATIVE ENGINE**

*The following checks will help determine which engine has failed.*

1. DEAD FOOT - DEAD ENGINE. The rudder pressure required to maintain directional control will be on the side of the good engine.
2. THROTTLE. Partially retard the throttle for the engine that is believed to be inoperative; there should be no change in control pressures or in the sound of the engine if the correct throttle has been selected. AT LOW ALTITUDE AND AIRSPEED THIS CHECK MUST BE ACCOMPLISHED WITH EXTREME CAUTION.

## **ONE-ENGINE INOPERATIVE PROCEDURES**

Do not attempt to determine the inoperative engine by means of the tachometers or the manifold pressure gages. These instruments often indicate near normal readings.

### **ENGINE FAILURE DURING TAKE-OFF**

1. Throttle - CLOSED
2. Braking - MAXIMUM

*If insufficient runway remains for stopping:*

3. Fuel Selector Valves - OFF
4. Battery, Generator/Alternator, and Magneto/Start Switches - OFF

**ENGINE FAILURE AFTER LIFT-OFF  
AND IN FLIGHT**

**NOTE**

The most important aspect of engine failure is the necessity to maintain lateral and directional control. If airspeed is below 78 kts, reduce power on the operative engine as required to maintain control.

An immediate landing is advisable regardless of take-off weight. Continued flight cannot be assured if take-off weight exceeds the weight determined from the TAKE-OFF WEIGHT graph. Higher take-off weights will result in a loss of altitude while retracting the landing gear and feathering the propeller. Continued flight requires immediate pilot response to the following procedures.

1. Landing Gear and Flaps - UP
2. Throttle (inoperative engine) - CLOSED
3. Propeller (inoperative engine) - FEATHER
4. Power (operative engine) - AS REQUIRED
5. Airspeed - MAINTAIN SPEED AT ENGINE FAILURE (99 KTS MAX.) UNTIL OBSTACLES ARE CLEARED

*After positive control of the airplane is established:*

6. Secure inoperative engine:
  - a. Mixture Control - IDLE CUT-OFF
  - b. Fuel Selector - OFF
  - c. Auxiliary Fuel Pump - OFF
  - d. Magneto/Start Switch - OFF
  - e. Generator/Alternator Switch - OFF
  - f. Cowl Flap - CLOSED
7. Electrical Load - MONITOR (Maximum load of 1.0 on remaining engine)

**AIR START**

*CAUTION*

The pilot should determine the reason for engine failure before attempting an air start.

1. Fuel Selector Valve - ON
2. Throttle - SET approximately 1/4 travel
3. Mixture Control - FULL RICH, below 5000 ft (1/2 travel above 5,000 ft)
4. Aux Fuel Pump - LOW
5. Magnetos - CHECK ON
6. Propeller:

*WITHOUT UNFEATHERING ACCUMULATORS:*

- a. Move propeller control forward of the feathering detent to midrange
- b. Engage Starter to accomplish unfeathering
- c. If engine fails to run, clear engine by allowing it to windmill with mixture in IDLE CUT-OFF. When engine fires, advance mixture to FULL RICH

*WITH UNFEATHERING ACCUMULATORS:*

- a. Move propeller control full forward to accomplish unfeathering. Use starter momentarily if necessary.
  - b. Return control to high pitch (low rpm) position, when windmilling starts, to avoid overspeed.
7. When Engine Starts - ADJUST THROTTLE, PROPELLER and MIXTURE CONTROLS
  8. Aux Fuel Pump - OFF (when reliable power has been regained)
  9. Generator/Alternator Switch - ON
  10. Oil Pressure - CHECK
  11. Warm Up Engine (approximately 2000 rpm and 15 in. Hg)
  12. Set power as required and trim

### **ENGINE FIRE (GROUND)**

1. Mixture Controls - IDLE CUT-OFF
2. Continue to crank affected engine
3. Fuel Selector Valves - OFF
4. Battery and Generator/Alternator Switches - OFF
5. Extinguish with Fire Extinguisher

### **ENGINE FIRE IN FLIGHT**

Shut down the affected engine according to the following procedure and land immediately. Follow the applicable single-engine procedures in this section.

1. Fuel Selector Valve - OFF
2. Mixture Control - IDLE CUT-OFF
3. Propeller - FEATHERED
4. Aux Fuel Pump - OFF
5. Magneto/Start Switch - OFF
6. Generator/Alternator Switch - OFF

### **EMERGENCY DESCENT**

1. Propellers - 2625 RPM
2. Throttles - CLOSED
3. Airspeed - 153 kts
4. Landing Gear - DOWN
5. Flaps - APPROACH (15°)

## **GLIDE**

1. Propellers - FEATHER
2. Flaps - UP
3. Landing Gear - UP
4. Cowl Flaps - CLOSED

The glide ratio in this configuration is approximately 2 nautical miles of gliding distance for each 1000 feet of altitude above the terrain at an airspeed of 120 kts.

## **LANDING EMERGENCIES**

### **GEAR-UP LANDING**

If possible, choose firm sod or foamed runway. When assured of reaching landing site:

1. Cowl Flaps - CLOSED
2. Wing Flaps - AS DESIRED
3. Throttles - CLOSED
4. Fuel Selector Valves - OFF
5. Mixture Controls - IDLE CUT-OFF
6. Battery, Generator/Alternator and Magneto/Start Switches - OFF
7. Keep wings level during touchdown.
8. Get clear of the airplane as soon as possible after it stops.

### **NOTE**

The gear up landing procedures are based on the best available information and no actual tests have been conducted.

## **ONE ENGINE INOPERATIVE LANDING**

*On final approach and when it is certain that the field can be reached:*

1. Landing Gear - DOWN
2. Flaps - APPROACH (15°)
3. Airspeed - NORMAL LANDING APPROACH SPEED (90 kts)
4. Power - AS REQUIRED to maintain 800 ft/min rate of descent

*When it is certain there is no possibility of go-around:*

5. Flaps - DOWN (30°)
6. Execute normal landing

## **ONE ENGINE INOPERATIVE GO-AROUND**

### **WARNING**

Level flight might not be possible for certain combinations of weight, temperature and altitude. In any event, DO NOT attempt a one engine inoperative go-around after flaps have been fully extended.

1. Power - MAXIMUM ALLOWABLE
2. Landing Gear - UP
3. Flaps - UP (0°)
4. Airspeed - MAINTAIN 99 KTS

## **SYSTEMS EMERGENCIES**

### **ONE-ENGINE INOPERATIVE OPERATION ON CROSSFEED**

#### **NOTE**

The fuel crossfeed system is to be used only during emergency conditions in level flight only.

#### *Left engine inoperative:*

1. Right Aux Fuel Pump - LOW
2. Left Fuel Selector Valve - OFF
3. Right Fuel Selector Valve - CROSSFEED
4. Right Aux Fuel Pump - LOW or OFF as required

#### *Right engine inoperative:*

1. Left Aux Fuel Pump - LOW
2. Right Fuel Selector Valve - OFF
3. Left Fuel Selector Valve - CROSSFEED
4. Left Aux Fuel Pump - LOW or OFF as required

### **ELECTRICAL SMOKE OR FIRE**

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

1. Battery and Generator/Alternator Switches - OFF

#### **WARNING**

Electrically driven flight instruments will become inoperative.

2. Oxygen - AS REQUIRED
3. All Electrical Switches - OFF
4. Battery and Generator/Alternator Switches - ON
5. Essential Electrical Equipment - ON (Isolate defective equipment:

**NOTE**

Ensure fire is out and will not be aggravated by draft. Turn off CABIN HEAT switch and push in the CABIN AIR control. Open pilot's storm window, if required.

**STARTER ENERGIZED WARNING LIGHT ILLUMINATED  
(If installed)**

After engine start, should the starter relay remain engaged, the starter will remain energized and the starter energized warning light will remain illuminated. Continuing to supply power to the starter will result in eventual loss of electrical power.

*Illuminated on the ground:*

1. Battery Master and both Alternator Switches - OFF.
2. Do not take off.

*Illuminated in flight after air start:*

1. Battery Master and both Alternator Switches - OFF.
2. Land as soon as practical.

**ILLUMINATION OF ALTERNATOR OUT LIGHT**

*In the event of the illumination of a single ALTERNATOR OUT light:*

1. Check the respective loadmeter for load indication
  - a. No Load - Turn off affected alternator
  - b. Regulate load

*In the event of the illumination of both ALTERNATOR OUT lights:*

1. Check loadmeters for load indication
  - a. No load indicates failure of regulator
    - (1) Switch regulators
    - (2) System should indicate normal



- b. If condition recurs
  - (1) Switch to original regulator
  - (2) System returns to normal, indicates overload condition causing malfunction
  - (3) Reduce load
- c. If condition indicates malfunction of both alternator circuits
  - (1) Both ALT Switches - OFF
  - (2) Minimize electrical load since only battery power will be available

#### **LANDING GEAR MANUAL EXTENSION**

*Reduce airspeed before attempting manual extension of the landing gear.*

1. LDG GR MOTOR Circuit Breaker - PULL
2. Landing Gear Handle - DOWN
3. Remove cover from handcrank at rear of front seats. Engage handcrank and turn counterclockwise as far as possible (approximately 50 turns)
4. If electrical system is operative, check landing gear position light and warning horn (check LDG GR RELAY circuit breaker engaged.)

#### **CAUTION**

The manual extension system is designed only to lower the landing gear; do not attempt to retract the gear manually.

#### **WARNING**

Do not operate the landing gear electrically with the handcrank engaged, as damage to the mechanism could occur.

After emergency landing gear extension, do not stow handcrank or move any landing gear controls or reset any switches or circuit breakers until airplane is on jacks, as failure may have been in the gear-up circuit and gear might retract with the airplane on the ground.

**LANDING GEAR RETRACTION AFTER  
PRACTICE MANUAL EXTENSION**

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

1. Handcrank - CHECK, STOWED
2. Landing Gear Motor Circuit Breaker - IN
3. Landing Gear Handle - UP

**ICE PROTECTION**

***SURFACE DEICE SYSTEM***

- a. Failure of AUTO Operation
  - (1) Surface Deice Switch - MANUAL (Do not hold more than 8 seconds)

***CAUTION***

The boots will inflate only as long as the switch is held in the MANUAL position. When the switch is released the boots will deflate.

- b. Failure of boots to deflate
  - (1) Pull circuit breaker on lower left instrument panel

***ELECTROTHERMAL PROPELLER DEICE  
SYSTEM***

1. Loss of one alternator; turn off unnecessary electrical equipment. Turn the prop deice system off while operating the cabin heater blower or the landing gear motor. Monitor electrical loads so as not to exceed alternator capacity of 1.0 on the loadmeter.

*An abnormal reading on the Propeller Deice Ammeter indicates need for the following action:*

a. Zero Amps:

Check prop deice circuit breaker. If the circuit breaker has tripped, a wait of approximately 30 seconds is necessary before resetting. If ammeter reads 0 and the circuit breaker has not tripped or if the ammeter still reads 0 after the circuit breaker has been reset, turn the switch off and consider the prop deice system inoperative.

b. Zero to 7 Amps, 2 Blade Propeller; Zero to 14 Amps, 3 Blade Propeller:

If the prop deice system ammeter occasionally or regularly indicates less than 7 amps for 2 blade, (or 14 amps for 3 blade), operation of the prop deice system can continue unless serious propeller imbalance results from irregular ice throw-offs.

c. 12 to 15 Amps, 2 Blade Propeller; 18 to 23 Amps, 3 Blade Propeller:

If the prop deicing system ammeter occasionally or regularly indicates 12 to 15 amps for 2 blade (or 18 to 23 amps for 3 blade), operation of the prop deice system can continue unless serious propeller imbalance results from irregular ice throw-offs.

d. More than 15 Amps, 2 Blade Propeller, More than 23 amps, 3 Blade Propeller:

If the prop deice system ammeter occasionally or regularly indicates more than 15 amps for 2 blade, or more than 23 amps for 3 blade, the system should not be operated unless the need for prop deicing is urgent.

### *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. Emergency Static Air Source - Switch to ON EMERGENCY. (lower sidewall adjacent to pilot)
2. For Airspeed Calibration and Altimeter Corrections, refer to the PERFORMANCE section.

### *CAUTION*

The emergency static air valve should remain in the OFF NORMAL position when system is not needed.

## **EMERGENCY EXITS**

Emergency exits, provided by the openable window on each side of the cabin, may be used for egress in addition to the cabin door and the optional cargo door.

### **NOTE**

For access past the 3rd and/or 4th seats, rotate the red handle, located on the lower inboard side of the seat back, and fold the seat back over.

### ***To Open Each Emergency Exit:***

Serials TC-2003 thru TC-2354, except TC-2340:

An emergency exit placard is installed below the left and right middle windows.

1. Lift the latch.
2. Pull out the emergency release pin and push the window out.

Serials TC-2340, TC-2355 and After:

1. Remove cover as indicated by placard in the center of the Ventilation/Emergency Exit latch.
2. Rotate handle up as indicated by placard, breaking safety wire, and push window out.

### **NOTE**

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

## **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 to 4 inches open. Flight characteristics of the airplane will not be affected except for a reduction in performance. 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.

## **SIMULATED ONE ENGINE INOPERATIVE**

### *ZERO THRUST (Simulated Feather)*

When establishing zero thrust operation, use the power setting listed below. By using this power setting to establish zero thrust, you avoid the inherent difficulties of restarting a shut down engine and preserve almost instant power to counter any attendant hazard. To set up a zero thrust condition:

1. Propeller Lever - RETARD TO FEATHER DETENT
2. Throttle Lever - SET 12 in. Hg MANIFOLD PRESSURE

### **NOTE**

This setting will approximate Zero Thrust using recommended One-Engine Inoperative Climb speeds.

## **SPINS**

*If a spin is entered inadvertently:*

Immediately move the control column full forward, apply full rudder opposite to the direction of the spin and reduce power on both engines to idle. These three actions should be done as near simultaneously as possible; then con-

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tinue to hold this control position until rotation stops and then neutralize all controls and execute a smooth pullout. Ailerons should be neutral during recovery.

**NOTE**

Federal Aviation Administration Regulations do not require spin demonstration of airplanes of this weight; therefore, no spin tests have been conducted. The recovery technique is based on the best available information.

# **SECTION IV**

## **NORMAL PROCEDURES**

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

**AIRSPEEDS FOR SAFE OPERATION (5100 LBS)**

**Maximum Demonstrated Crosswind**

Component ..... 22 kts

**Takeoff:**

Lift-off ..... 84 kts

50-ft Speed ..... 91 kts

Two-Engine Best Angle-of-Climb ( $V_X$ ) ..... 84 kts

Two-Engine Best Rate-of-Climb ( $V_Y$ ) ..... 107 kts

Cruise Climb ..... 122 kts

Turbulent Air Penetration ..... 157 kts

**Landing Approach:**

Flaps DN ..... 90 kts

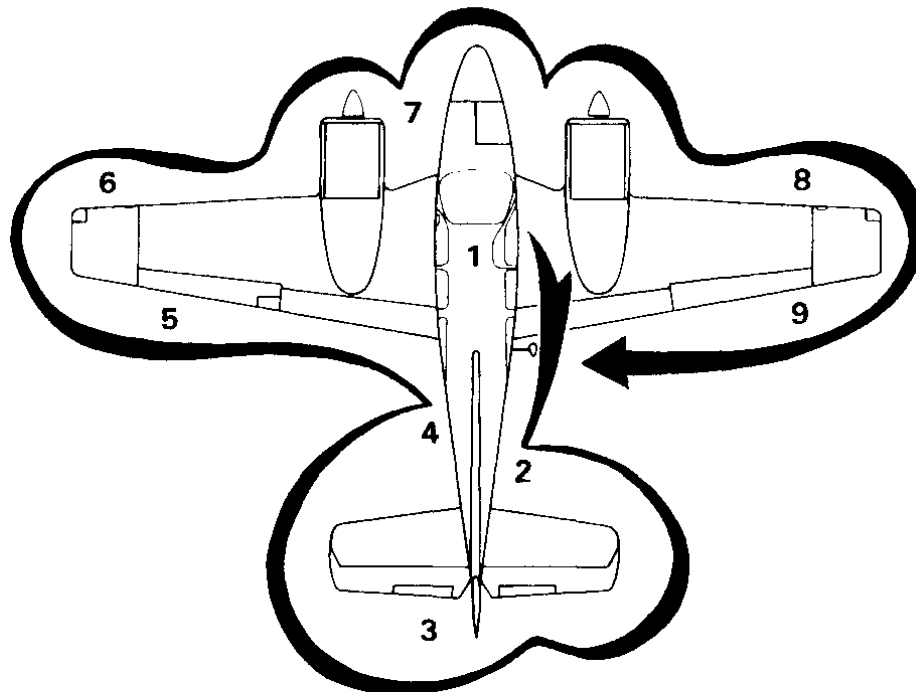
Flaps  $0^\circ$  ..... 97 kts

Balked Landing Climb ..... 90 kts

**Intentional One-Engine-Inoperative**

Speed ( $V_{SSE}$ ) ..... 84 kts

Air Minimum Control Speed ( $V_{MCA}$ ) ..... 78 kts



**PREFLIGHT INSPECTION**

**1. COCKPIT:**

- a. Control Lock - REMOVE AND STOW
- b. Parking Brake - SET
- c. All Switches - OFF
- d. Trim Tabs - SET TO ZERO

**2. RIGHT FUSELAGE:**

- a. Load Distribution - CHECK AND SECURED
- b. Baggage Door - SECURE
- c. Static Port - UNOBSTRUCTED
- d. Emergency Locator Transmitter - ARMED

**3. EMPENNAGE:**

- a. Control Surfaces, Tabs and Deice Boots - CHECK CONDITION, SECURITY, AND ATTACHMENT
- b. Tail Cone, Tail Light, and Rudder Beacon - CHECK
- c. Tie Down - REMOVE
- d. Cabin Air Inlet - CHECK

**4. LEFT FUSELAGE:**

- a. Cabin Air Outlet - CHECK
- b. Static Port - UNOBSTRUCTED
- c. All Antennas and Lower Beacon - CHECK

**5. LEFT WING TRAILING EDGE:**

- a. Fuel Sump Aft of Wheel Well - Drain
- b. Fuel Vents - CHECK
- c. Flap~ CHECK GENERAL CONDITION
- d. Aileron - CHECK CONDITION AND FREEDOM OF MOVEMENT, TAB NEUTRAL WHEN AILERON NEUTRAL

**6. LEFT WING LEADING EDGE**

- a. Lights and Deice Boot - CHECK FOR CONDITION
- b. Stall Warning Vane - CHECK FREEDOM OF MOVEMENT
- c. Fuel - CHECK QUANTITY AND CAP SECURE

- d. Fuel Sight Gage - CHECK
  - e. Pitot - REMOVE COVER, EXAMINE FOR OBSTRUCTIONS
  - f. Tie Down, Chocks - REMOVE
  - g. Engine Oil - CHECK QUANTITY, CAP AND DOOR SECURE
  - h. Landing Light - CHECK
  - i. Engine Cowling and Doors - CHECK CONDITION AND SECURITY
  - j. Engine Air Intake - EXAMINE FOR OBSTRUCTIONS
  - k. Propeller - EXAMINE FOR NICKS, SECURITY AND OIL LEAKS
  - l. Cowl Flap - CHECK
  - m. Wheel Well Doors, Tire, Brake Line and Shock Strut - CHECK
  - n. Landing Gear Uplock Roller - CHECK
  - o. Fuel Drains - DRAIN
7. NOSE SECTION
- a. Wheel Well Doors, Tire and Shock Strut - CHECK
  - b. Taxi Light - CHECK (if installed)
  - c. Heater Air Inlets - CLEAR
  - d. Oxygen - CHECK
  - e. Baggage Door - SECURE
8. RIGHT WING LEADING EDGE
- a. Wheel Well Doors, Tire, Brake Line, and Shock Strut - CHECK
  - b. Landing Gear Uplock Roller - CHECK
  - c. Cowl Flap - CHECK
  - d. Fuel Drains - DRAIN
  - e. Engine Oil - CHECK QUANTITY, CAP AND DOOR SECURE
  - f. Engine Cowling and Doors - CHECK CONDITION AND SECURITY
  - g. Landing Light - CHECK

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- h. Propeller - EXAMINE FOR NICKS, SECURITY AND OIL LEAKS
  - i. Engine Air Intake - EXAMINE FOR OBSTRUCTIONS
  - j. Fuel Sight Gage - CHECK
  - k. Fuel - CHECK QUANTITY AND SECURE CAP
  - l. Tie Down and Chocks - REMOVE
  - m. Lights and Deice Boot - CHECK FOR CONDITION
9. RIGHT WING TRAILING EDGE
- a. Aileron - CHECK CONDITION AND FREEDOM OF MOVEMENT
  - b. Fuel Vents - CHECK
  - c. Fuel Sump Aft of Wheel Well - DRAIN
  - d. Flap - CHECK GENERAL CONDITION

**CAUTION**

DO NOT TAXI WITH A FLAT SHOCK STRUT.

**NOTE**

Check operation of lights if night flight is anticipated.

**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. Oxygen - CHECK QUANTITY AND OPERATION
- 6. Landing Gear Handle - DOWN
- 7. Cowl Flap - CHECK, OPEN
- 8. Fuel Selector Valves - CHECK OPERATION THEN ON
- 9. All Circuit Breakers, Switches and Equipment Controls - CHECK
- 10. Battery and Alternator Switches - ON (if external power is to be used, Alternator Switches - OFF)

11. Fuel Quantity Indicators - CHECK QUANTITY (See LIMITATIONS for take-off fuel)
12. Landing Gear Position Lights - CHECK

### **STARTING**

1. Throttle Position - APPROXIMATELY 1/2 IN. OPEN
2. Propeller Control - LOW PITCH (high rpm)
3. Mixture Control - FULL RICH

#### **NOTE**

If the engine is hot, and the ambient temperature is 90°F or above, place mixture control in IDLE CUT-OFF, switch aux fuel pump to HIGH for 30 to 60 seconds, then OFF. Return mixture control to FULL RICH.

4. Aux Fuel Pump - HIGH (Until fuel flow stabilizes then - OFF)
5. Magneto/Start Switch - START (Observe Starter Limits)

#### **CAUTION**

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

#### **NOTE**

In the event of a balked start (or overprime condition) place mixture control in IDLE CUT-OFF and open the throttle; operate the starter to remove excess fuel. As engine starts, reduce the throttle to idle rpm and place the mixture control in FULL RICH.

6. Warm-up - 800 to 1200 RPM

7. Oil Pressure - 25 PSI WITHIN 30 SECONDS
8. External Power (if used) - DISCONNECT

**WARNING**

When using external power, start the right engine first, since the external power receptacle is on the left nacelle. Disconnect external power before starting left engine.

9. Generator/Alternator Switch - ON
10. All Engine Indicators - CHECK
11. Starter Energized Warning Light (if installed) - CHECK for illumination during initial start. Should not be illuminated after starting.

**CAUTION**

If the starter energized warning light is not installed, or is inoperative and the total of both loadmeters exceeds .2 after two minutes at 1000-1200 rpm, with no additional electrical equipment on, and the indication shows no signs of decreasing, an electrical malfunction is indicated. The battery master and both generator/alternator switches should be placed in the OFF position. Do not take off.

Low voltage, high ammeter or loadmeter readings, dimming of lights, or excessive noise in radio receivers could be indications that problems are developing in the starter system. A noted change in such normal conditions could indicate prolonged starter motor running and the engine should be shut down. No further flight operations should be attempted until the cause is determined and repaired.

12. Using the same procedure, start other engine.

**AFTER STARTING AND TAXI**

***CAUTION***

Do not operate engine above 1200 RPM until oil temperature reaches 75°F.

1. Brakes - RELEASE AND CHECK
2. Avionics - ON, AS REQUIRED
3. Exterior Lights - AS REQUIRED

**BEFORE TAKEOFF**

1. Seat Belts and Shoulder Harnesses - CHECK
2. Parking Brake - SET
3. Aux Fuel Pumps - OFF  
(If ambient temperature is 90°F or above,  
use LOW pressure boost)
4. All Instruments - CHECKED
5. Fuel Indicators - CHECK QUANTITY
6. Mixture - FULL RICH (or as required by field elevation)
7. Propellers - EXERCISE AT 2200 RPM

***CAUTION***

When exercising propellers in their governing range, do not move the control lever aft past the detent. To do so will allow the propeller to change rapidly to the full feathered position, imposing high stresses on the blade shank and engine.

8. Starter Energized Warning Light (if installed) - CHECK; should be illuminated during start and extinguished after start. If light is not installed or is inoperative, check loadmeters for proper indication.
9. Throttles - 1700 RPM
10. Magnetos - CHECK (Variance between individual magnetos should not exceed 50 rpm, max. drop 150 rpm)
11. Throttles - 1500 RPM



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12. Propellers - FEATHERING CHECK (Do not allow an rpm drop of more than 500 rpm)
13. Throttles - IDLE
14. Friction - ADJUST
15. Trim - AS REQUIRED FOR TAKE-OFF
16. Flaps - CHECK AND SET FOR TAKE-OFF
17. Flight Controls - CHECK PROPER DIRECTION, FULL TRAVEL AND FREEDOM OF MOVEMENT
18. Doors and Windows - LOCKED
19. Parking Brake - OFF

**TAKE-OFF**

Take-Off Power ..... Full throttle, 2625 rpm  
Minimum Take-Off Oil Temperature ..... 75°F

1. Power - SET TAKE-OFF POWER (MIXTURE - SET FUEL FLOW TO ALTITUDE) BEFORE BRAKE RELEASE
2. Airspeed - ACCELERATE TO AND MAINTAIN RECOMMENDED SPEED
3. Landing Gear - RETRACT (when positive rate of climb is established)
4. Airspeed - ESTABLISH DESIRED CLIMB SPEED (when clear of obstacles)

**MAXIMUM PERFORMANCE CLIMB (TC-2003 thru TC-2284)**

1. Power - SET MAXIMUM CONTINUOUS POWER
2. Mixtures - LEAN TO APPROPRIATE FUEL FLOW
3. Cowl Flaps - OPEN
4. Airspeed - ESTABLISH 107 KTS

**CRUISE CLIMB**

1. Power - SET (25.0 in. Hg or Full Throttle - 2500 RPM)
2. Mixture Controls - LEAN TO APPROPRIATE FUEL FLOW
3. Airspeed - 122 KTS
4. Cowl Flaps - AS REQUIRED

**NOTE**

In high ambient temperatures, low pressure boost may be required to prevent excessive fuel flow fluctuations.

**MAXIMUM NORMAL OPERATING POWER  
CLIMB (TC-2285 and After)**

1. Power - SET (Full Throttle or 2550 RPM)
2. Mixtures - LEAN TO APPROPRIATE FUEL FLOW
3. Cowl Flaps - AS REQUIRED
4. Airspeed - 107 KTS

**CRUISE**

Maximum Cruise Power . . . . . 24.5 in. Hg at 2450 rpm  
Recommended Cruise Power . 24.0 in. Hg at 2300 rpm  
Recommended Cruise Power . 22.0 in. Hg at 2200 rpm  
Economy Cruise Power . . . . . 20.0 in. Hg at 2100 rpm

1. Power - SET AS DESIRED (Use Tables in PERFORMANCE section)
2. Fuel Flow - LEAN AS REQUIRED
3. Cowl Flaps - AS REQUIRED

**LEANING USING THE EXHAUST GAS TEMPERATURE  
INDICATOR (EGT)**

The system consists of a thermocouple type exhaust gas temperature (EGT) probe mounted in the right side of each exhaust system. This probe is connected to an indicator on the right side of the instrument panel. The indicator is calibrated in degrees Fahrenheit. Use EGT system to lean the fuel/air mixture when cruising at maximum cruise power or less.

**INTENTIONALLY LEFT BLANK**

1. Lean the mixture and note the point on the indicator that the temperature peaks and starts to fall.
  - a. **CRUISE (LEAN) MIXTURE** - Increase the mixture until the EGT shows a drop of 25°F below peak on the rich side of peak.
  - b. **BEST POWER MIXTURE** - Increase the mixture until the EGT shows a drop of 100°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. Cowl Flaps - CLOSED
3. Windshield Defroster - AS REQUIRED
4. Power - AS REQUIRED (avoid prolonged idle settings and low cylinder head temperatures)

### *Recommended descent speeds:*

|                  |                |
|------------------|----------------|
| Smooth air ..... | 172 kts        |
| Rough air .....  | (Max.) 157 kts |

## **BEFORE LANDING**

1. Seat Belts and Shoulder Harnesses - FASTENED, SEAT BACKS UPRIGHT
2. Fuel Selector Valves - CHECK ON
3. Aux. Fuel Pumps - OFF, OR LOW AS PER AMBIENT TEMPERATURE
4. Cowl Flaps - AS REQUIRED
5. Mixture Controls - FULL RICH (or as required by field elevation)
6. Landing Gear - DOWN (Gear extension speed 153 kts)
7. Flaps - DOWN (Maximum extension speed 122 kts)
8. Airspeed - ESTABLISH NORMAL LANDING APPROACH SPEED.
9. Propellers - LOW PITCH (high rpm)

## **BALKED LANDING**

1. Propellers - LOW PITCH (high rpm)
2. Power - MAXIMUM ALLOWABLE
3. Airspeed - BALKED LANDING CLIMB SPEED (90 KTS)
4. Flaps - UP
5. Landing Gear - UP
6. Cowl Flaps - AS REQUIRED

## **AFTER LANDING**

1. Landing and Taxi Lights - AS REQUIRED
2. Flaps - UP
3. Trim Tabs - SET TO ZERO
4. Cowl Flaps - OPEN
5. Aux Fuel Pumps - AS REQUIRED

## **SHUT DOWN**

1. Parking Brake - SET
2. Propellers - HIGH RPM
3. Throttles - 1000 RPM
4. Aux Fuel Pumps - OFF
5. Electrical and Avionics Equipment - OFF
6. Mixture Controls - IDLE CUT-OFF
7. Magneto/Start Switches - OFF, AFTER ENGINES STOP
8. Battery and Generator/Alternator Switches - OFF
9. Controls - LOCKED
10. If airplane is to be parked for an extended period of time, install wheel chocks and release the parking brake as greatly varying ambient temperatures may build excessive pressures on the hydraulic system.

**OXYGEN SYSTEM**

**WARNING**

NO SMOKING permitted when using oxygen.

**PREFLIGHT**

1. Check Oxygen Pressure Gage for pressure reading.
2. Determine percent of full system.
3. Multiply oxygen duration in minutes by percent of full system.

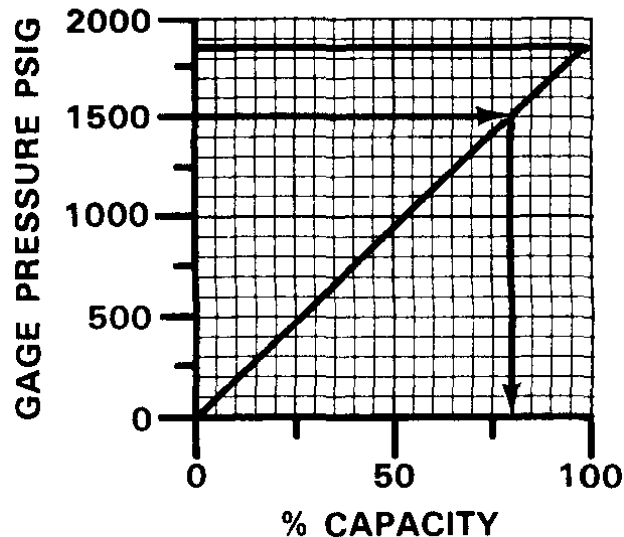
**EXAMPLE:**

|                               |             |
|-------------------------------|-------------|
| People                        | 5           |
| Gage Pressure                 | 1500 psi    |
| Percent Capacity (from chart) | 80%         |
| Cylinder Capacity (full)      | 49 cu ft    |
| Altitude (planned flight)     | 15,000 feet |
| Duration (full cylinder)      | 149 minutes |
| Duration (80% full)           | 119 minutes |

***OXYGEN DURATION***

Oxygen duration is computed for a Scott Altitude Compensated System assuming 90% of cylinder volume usable and using Scott oxygen masks rated at 3.0 Standard Liters Per Minute (SLPM). These masks are identified by a green color coded plug-in.

**OXYGEN AVAILABLE WITH  
PARTIALLY FULL BOTTLE**



**OXYGEN DURATION CHART**

*Duration in minutes at the following altitudes:*

|          | <b>Persons<br/>Using</b> | <b>12,500</b> | <b>15,000</b> | <b>20,000</b> |
|----------|--------------------------|---------------|---------------|---------------|
| 49 cu ft | 1                        | 1014          | 746           | 507           |
|          | 2                        | 507           | 373           | 253           |
|          | 3                        | 338           | 248           | 169           |
|          | 4                        | 253           | 186           | 126           |
|          | 5                        | 202           | 149           | 101           |
|          | 6                        | 169           | 124           | 84            |
| 66 cu ft | 1                        | 1344          | 988           | 672           |
|          | 2                        | 672           | 494           | 336           |
|          | 3                        | 448           | 329           | 224           |
|          | 4                        | 336           | 247           | 168           |
|          | 5                        | 268           | 197           | 134           |
|          | 6                        | 224           | 164           | 112           |



**IN FLIGHT**

The use of oxygen is recommended to be in accordance with current FAR operating rules.

1. Oxygen Control Valve - OPEN SLOWLY
2. Mask - INSERT FITTING, DON MASK (adjust mask for proper fit)
3. Oxygen Flow Indicator - CHECK (red plunger lifts from its seat when the hose is inserted into the oxygen coupling)

**AFTER USING**

1. Discontinue use by unplugging mask from outlet.

**NOTE**

Closing the control valve while in flight is not necessary due to automatic sealing of the outlet when the mask is unplugged.

2. Oxygen Control Valve - CLOSE (may be accomplished during shut-down).

## **COLD WEATHER OPERATION**

### **PREFLIGHT INSPECTION**

In addition to the normal preflight exterior inspection, remove ice, snow and frost from the wings, tail, control surfaces and hinges, propellers, windshield, fuel cell filler caps and fuel vents. If you have no way of removing these formations of ice, snow, and frost leave the airplane on the ground, as these deposits will not blow off. The wing contour may be changed by these formations sufficiently that its lift qualities are considerably disturbed and sometimes completely destroyed. Complete your normal preflight procedures. Check the flight controls for complete freedom of movement.

Conditions for accumulating moisture in the fuel tanks are most favorable at low temperatures due to the condensation increase and the moisture that enters as the system is serviced. Therefore, close attention to draining the fuel system will assume particular importance during cold weather.

### **ENGINES**

Use engine oil in accordance with Consumable Materials in the **SERVICING** section. Always pull the propeller through by hand 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 an auxiliary power unit is not used.

Under very cold conditions, it may be necessary to preheat the engine prior to a start. Particular attention should be applied to the oil cooler, and engine sump to insure 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 engines are 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, watch engine temperatures closely, since it is quite possible to exceed the cylinder head temperature limit in trying to bring up the oil temperature. Exercise the propellers several times to remove cold oil from the pitch change mechanisms. The propellers should also be cycled occasionally in flight.

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

## **EXTERNAL POWER**

It is very important that the following precautions be observed while using external power.

1. The airplane has a negative ground system. Be sure to connect the positive lead of the auxiliary power unit to the positive terminal of the airplane's external power receptacle and the negative lead of the auxiliary power unit 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 battery switch is ON, 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 voltage transients (power fluctuations).

## **STARTING ENGINES USING AUXILIARY POWER UNIT**

1. Battery switch - ON
2. Generators/Alternators, Electrical, and Avionics Equipment - OFF
3. Auxiliary Power Unit - CONNECT
4. Auxiliary Power Unit - SET OUTPUT (27.0 to 28.5 volts)
5. Auxiliary Power Unit - ON
6. Right Engine - START (use normal start procedures)

## **Section IV**

### **Normal Procedures**

## **BEEHCRAFT Baron B55**

### **Serial TC 2003 and After**

7. Auxiliary Power Unit - OFF (after engine has been started)
8. Auxiliary Power Unit - DISCONNECT (before starting left engine)
9. Generator/Alternator Switches - ON

### **TAXIING**

Avoid taxiing through water, slush or muddy surfaces if possible. In cold weather, water, slush or mud, when splashed onto landing gear mechanisms or control surface hinges may freeze, preventing free movement and resulting in structural damage.

### **ICE PROTECTION SYSTEMS**

The following equipment, when installed and operable, will provide a degree of protection when icing conditions are inadvertently encountered. Since this equipment has not been demonstrated to meet current requirements for flight into known icing conditions, the pilot must exit such conditions as soon as possible if ice accumulates on the airplane.

1. Equipment required for IFR flight
2. Beech approved emergency static air source
3. Beech approved surface deice system
4. Beech approved propeller deice or anti-ice system
5. Beech approved pitot heat
6. Beech approved heated stall warning
7. Beech approved heated fuel vents
8. Beech approved windshield defogging and openable storm window
9. Beech approved alternate induction air
10. Beech approved external antenna masts (capable of withstanding ice loads)

**WARNING**

Stalling airspeeds should be expected to increase due to the distortion of the wing airfoil when ice has accumulated on the airplane. For the same reason, stall warning devices are not accurate and should not be relied upon. With ice on the airplane, maintain a comfortable margin of airspeed above the normal stall airspeed.

**1. EMERGENCY STATIC AIR SOURCE**

*If the Emergency Static Air Source is desired for use:*

- a. Emergency Static Air Source - ON EMERGENCY  
(lower sidewall adjacent to pilot)
- b. For Airspeed Calibration and Altimeter Corrections, refer to PERFORMANCE section

**CAUTION**

The emergency static air valve should be in the OFF NORMAL position when the system is not needed.

**2. SURFACE DEICE SYSTEM**

- a. **BEFORE TAKE-OFF**
  - (1) Throttles - 2000 RPM
  - (2) Surface Deice Switch - AUTO (UP)
  - (3) Deice Pressure - 9 to 20 PSI (while boots are inflating)
  - (4) Wing Boots - CHECK VISUALLY FOR INFLATION AND HOLD DOWN

*b. IN FLIGHT*

*When ice accumulates 1 / 2 to 1 inch*

- (1) Surface Deice Switch - AUTO (UP)
- (2) Deice Pressure - 9 to 20 PSI (while boots are inflating)
- (3) Repeat - AS REQUIRED

**CAUTION**

Rapid cycles in succession or cycling before at least 1/2 inch of ice has accumulated may cause the ice to grow outside the contour of the inflated boots and prevent ice removal.

Stall speeds are increased 4 kts in all configurations with surface deice system operating.

**NOTE**

Either engine will supply sufficient vacuum and pressure for deice operation.

- c. For Emergency Operation refer to the EMERGENCY PROCEDURES section.

**3. ELECTROTHERMAL PROPELLER DEICE**

**CAUTION**

Do not operate the propeller deice when propellers are static.

*a. BEFORE TAKEOFF*

- (1) Propeller Deice Switch - ON
- (2) Propeller Deice Ammeter - CHECK, 7 to 12  
amps (2 Blade), 14 to 18 amps (3 Blade)

*b. IN FLIGHT*

- (1) Propeller Deice Switch - ON. The system may  
be operated continuously in flight and will  
function automatically until the switch is  
turned OFF.
- (2) Relieve propeller imbalance due to ice by in-  
creasing rpm briefly and returning to the  
desired setting. Repeat as necessary.

**CAUTION**

If the propeller deice ammeter indicates ab-  
normal reading, refer to the Emergency Pro-  
cedures section.

**4. PROPELLER AND WINDSHIELD ANTI-ICE SYSTEM  
(FLUID FLOW)**

**CAUTION**

This anti-ice system is designed to PREVENT  
the formation of ice. Always turn the system ON  
before entering icing conditions.



*a. PREFLIGHT*

- (1) Check the quantity in reservoir
- (2) Check slinger ring and lines for obstructions
- (3) Check propeller boots for damage

*b. IN FLIGHT*

- (1) Prop Anti-ice Switch - ON
- (2) Windshield Anti-ice Switch - CYCLE AS REQUIRED
- (3) Anti-ice Quantity Indicator - MONITOR

**NOTE**

Prop anti-ice switch must be ON before windshield anti-ice system will function.

System endurance is approximately two hours with full reservoir, using prop anti-ice only and approximately 28 minutes with props and windshield anti-ice in operation.

**5. PITOT HEAT AND HEATED STALL WARNING**

- a. Pitot Heat Switch(es) - ON (Note deflection on Loadmeter) Heated Stall Warning is activated by the left pitot heat switch.

**NOTE**

Switches may be left on throughout flight. Prolonged operation on the ground could damage the Pitot Heat System.

**6. FUEL VENT HEAT**

- a. Fuel Vent Switch - ON (If ice is encountered)

**7. WINDSHIELD DEFOGGING**

- a. Defrost Control - PUSH ON
- b. Pilot's Storm Window - OPEN, AS REQUIRED

**ENGINE BREAK-IN INFORMATION**

Refer to Systems section.

**PRACTICE DEMONSTRATION OF  $V_{MCA}$**

$V_{MCA}$  demonstration may be required for multi-engine pilot certification. The following procedure shall be used at a safe altitude of at least 5000 feet above the ground in clear air only.

**WARNING**

**INFLIGHT ENGINE CUTS BELOW  $V_{SSE}$   
SPEED OF 84 KTS ARE PROHIBITED.**

- 1. Landing Gear - Up
- 2. Flaps - Up
- 3. Airspeed - Above 84 kts ( $V_{SSE}$ )
- 4. Propeller Levers - High RPM
- 5. Throttle (Simulated inoperative engine) - Idle
- 6. Throttle (Other engine) - Maximum Manifold Pressure
- 7. Airspeed - Reduce approximately 1 knot per second until either  $V_{MCA}$  or stall warning is obtained.

***CAUTION***

Use rudder to maintain directional control (heading) and ailerons to maintain 5° bank towards the operative engine (lateral attitude). At the first sign of either  $V_{MCA}$  or stall warning (which may be evidenced by: inability to maintain heading or lateral attitude, aerodynamic stall buffet, or stall warning horn sound) immediately initiate recovery: reduce power to idle on the operative engine and immediately lower the nose to regain  $V_{SSE}$ .

**NOISE CHARACTERISTICS**

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

For VFR operations over outdoor assemblies of persons, recreational and park areas, and other noise-sensitive areas, pilots should make every effort to fly not less than 2000 feet above the surface, weather permitting, even though flight at a lower level may be consistent with the provisions of government regulations.

**NOTE**

The preceding recommended procedures do not apply where they would conflict with Air Traffic Control clearances or instructions, or where, in the pilot's judgement, an altitude of less than 2000 feet is necessary to adequately exercise his duty to see and avoid other airplanes.

Flyover noise levels established in compliance with FAR 36 are:

For Serials TC-2285 and After:

2-Blade Propeller Using MNOP 78.0 dB(A)  
3-Blade Propeller Using MNOP 74.7 dB(A)

**NOTE**

Flyover noise levels given are not applicable for serials TC-2003 thru TC-2284.

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

# **SECTION V**

## **PERFORMANCE**

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## **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 takeoff, climb, landing and flight planning at various parameters of weight, power, altitude, and temperature. FAA approved performance information is included in this section. Examples are presented on all performance graphs. In addition, the calculations for flight time, block speed, and fuel required are presented using the conditions listed.

Performance with a gross weight of 4990 lbs (Baron B55A) will be equal to or better than that of the higher gross weight Baron B55.

### **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-V81-AMA

For VFR Cruise at 11,500 feet

**Section V**  
**Performance**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

| ROUTE<br>SEGMENT | MAGNETIC<br>COURSE | DIST<br>NM | WIND<br>11500<br>FEET<br>DIR/KTS | OAT<br>11500<br>FEET<br>°C | ALT<br>SETTING<br>IN.HG |
|------------------|--------------------|------------|----------------------------------|----------------------------|-------------------------|
| DEN-COS          | 161°               | 55         | 010/30                           | -5                         | 29.60                   |
| COS-PUB          | 153°               | 40         | 010/30                           | -5                         | 29.60                   |
| PUB-TBE          | 134°               | 74         | 100/20                           | 0                          | 29.56                   |
| TBE-DHT          | 132°               | 87         | 200/20                           | 9                          | 29.56                   |
| DHT-AMA          | 125°               | 65         | 200/20                           | 10                         | 29.56                   |

\*REFERENCE: Enroute Low Altitude Chart L-6

At Amarillo:

Outside Air Temperature ..... 25°C (77°F)  
 Field Elevation ..... 3605 ft  
 Altimeter Setting ..... 29.56 in. Hg  
 Wind ..... 180° at 10 kts  
 Runway 21 Length ..... 10,000 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:

$$29.92 - 29.60 = .32 \text{ in. Hg}$$

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

$$5330 + 320 = 5650 \text{ ft}$$



**BEECHCRAFT Baron B55  
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Pressure Altitude at AMA:

$$29.92 - 29.56 = .36 \text{ in. Hg}$$

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

$$3605 + 360 = 3965 \text{ ft}$$

**NOTE**

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

Maximum Allowable Take-off Weight = 5100 lbs

$$\text{Ramp Weight} = 5100 + 21 = 5121 \text{ lbs}$$

**NOTE**

Fuel for start, taxi and take-off is normally 21 pounds.

Enter the Take-Off Weight graph at 5650 feet pressure altitude and 15°C.

The take-off weight to achieve a positive rate-of-climb at lift-off for one engine inoperative is:

$$\text{Take-off Weight} = 4550 \text{ pounds}$$

**Section V**  
**Performance**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

Enter the Take-Off Distance graph at 15°C, 5650 feet pressure altitude, 5100 pounds, and 9.5 knots headwind component.

|                                          |         |
|------------------------------------------|---------|
| Ground Roll .....                        | 2000 ft |
| Total Distance over 50 ft Obstacle ..... | 3200 ft |
| Lift-off Speed .....                     | 84 kts  |
| 50 Foot Speed .....                      | 91 kts  |

Enter the Accelerate-Stop graph at 15°C, 5650 feet pressure altitude, 5100 pounds, and 9.5 knots headwind component:

|                                |         |
|--------------------------------|---------|
| Accelerate-Stop Distance ..... | 4100 ft |
| Engine Failure Speed .....     | 84 kts  |

**NOTE**

Since 4100 feet is less than the available field length (10,010 ft), the accelerate-stop procedure can be performed at any weight.

Take-off at 5100 lbs can be accomplished. However, if an engine failure occurs before becoming airborne, the accelerate-stop procedure must be performed.

The following example assumes the airplane is loaded so that the take-off weight is 4550 pounds.

Although not required by regulations, information has been presented to determine the take-off weight, field requirements and take-off flight path assuming an engine failure occurs during the take-off procedure. The following illustrates the use of these charts.

Enter the Accelerate-Go graph at 15°C, 5650 feet pressure altitude, 4550 pounds, and 9.5 knots headwind component:

|                                          |         |
|------------------------------------------|---------|
| Ground Roll .....                        | 1800 ft |
| Total Distance Over 50 ft Obstacle ..... | 7100 ft |
| Lift-off Speed .....                     | 84 kts  |
| 50 Foot Speed .....                      | 91 kts  |

Enter the graph for Take-off Climb Gradient - One Engine Inoperative at 15°C, 5650 feet pressure altitude, and 4550 pounds.

|                      |        |
|----------------------|--------|
| Climb Gradient ..... | 2.2%   |
| Climb Speed .....    | 91 kts |

A 2.2% climb gradient is 22 feet of vertical height per 1000 feet of horizontal distance.

#### **NOTE**

The Climb Gradient - One Engine Inoperative graph assumes zero wind conditions. Climbing into a headwind will result in higher angles of climb, and hence, better obstacle clearance capabilities.

**Section V**  
**Performance**

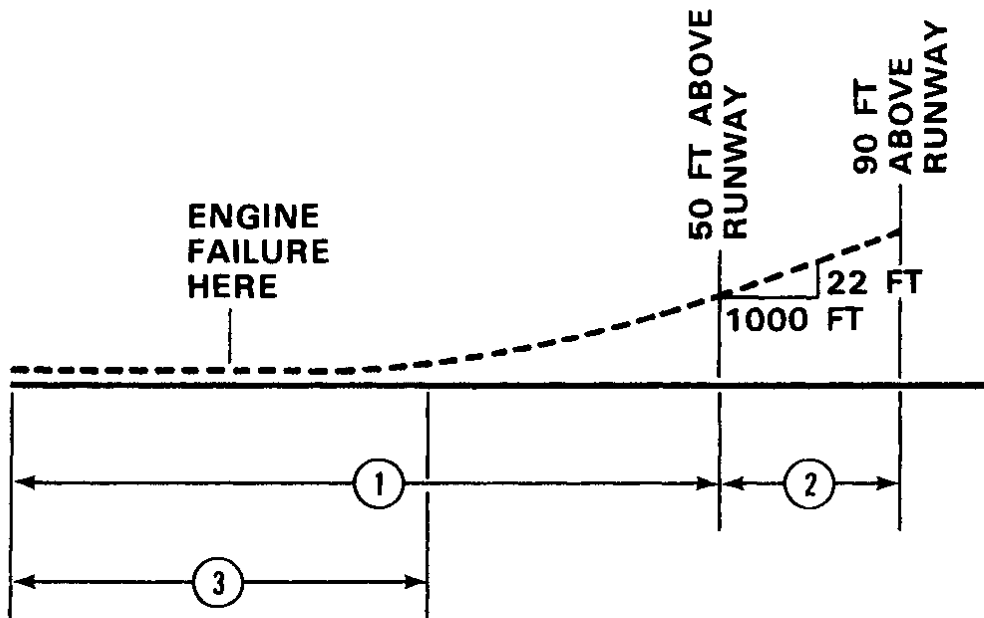
**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

Calculation of horizontal distance to clear an obstacle 90 feet above the runway surface:

Horizontal distance used to climb from 50 feet to 90 feet  
=  $(90-50) (1000 \div 22) = 1818$  feet

Total Distance =  $7100 + 1818 = 8918$  feet

The above results are illustrated below:



- ① Accelerate-go take-off distance = 7100 feet
- ② Distance to climb from 50 ft. to 90 ft above runway = 1818 feet
- ③ Accelerate-stop distance for 5100 lbs. take-off weight = 4100 feet

The following calculations provide information for the flight planning procedure. All examples are presented on the performance graphs. A take-off weight of 5100 pounds has been assumed.

Enter the Time, Fuel, and Distance to Climb graph at 15°C to 5650 feet and to 5100 pounds. Also enter at -5°C to 11,500 feet and to 5100 pounds. Read:

Time to Climb =  $(10-4) = 6$  min

Fuel Used to Climb =  $(5.7-2.5) = 3.2$  gal

Distance Traveled =  $(22-9) = 13$  NM

The temperatures for cruise are presented for a standard day (ISA); 20°C (36°F) above a standard day (ISA + 20°C); and 20°C (36°F) below a standard day (ISA - 20°C). These should be used for flight planning. The IOAT values are true temperature values which have been adjusted for the compressibility effects. IOAT should be used for setting cruise power while enroute.

Enter the graph for ISA conversion at 11,500 feet and the temperature for the route segment:

|         |               |   |            |
|---------|---------------|---|------------|
| DEN-PUB | OAT           | = | -5°C       |
|         | ISA Condition | = | ISA + 3°C  |
| PUB-TBE | OAT           | = | 0°C        |
|         | ISA Condition | = | ISA + 8°C  |
| TBE-DHT | OAT           | = | 9°C        |
|         | ISA Condition | = | ISA + 17°C |
| DHT-AMA | OAT           | = | 10°C       |
|         | ISA Condition | = | ISA + 18°C |

**Section V**  
**Performance**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

Enter the table for recommended cruise power - 24 in. Hg, 2300 rpm at 10,000 ft, 12,000 ft, ISA and ISA + 20°C.

|                       | TEMPERATURE              |                             |              |                          |                             |              |
|-----------------------|--------------------------|-----------------------------|--------------|--------------------------|-----------------------------|--------------|
|                       | ISA                      |                             |              | ISA + 20°C               |                             |              |
| ALTI-<br>TUDE<br>FEET | MAN.<br>PRESS.<br>IN. HG | FUEL<br>FLOW<br>GPH/<br>ENG | TAS<br>KNOTS | MAN.<br>PRESS.<br>IN. HG | FUEL<br>FLOW<br>GPH/<br>ENG | TAS<br>KNOTS |
| 10000                 | 20.2                     | 10.9                        | 176          | 20.2                     | 10.6                        | 177          |
| 12000                 | 18.7                     | 10.2                        | 173          | 18.7                     | 10.0                        | 174          |

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

| ROUTE<br>SEGMENT | MAN.<br>PRESS.<br>IN. HG | FUEL<br>FLOW<br>GPH/ENG | TAS<br>KNOTS |
|------------------|--------------------------|-------------------------|--------------|
| DEN-PUB          | 19.1                     | 10.4                    | 175          |
| PUB-TBE          | 19.1                     | 10.3                    | 175          |
| TBE-DHT          | 19.1                     | 10.2                    | 174          |
| DHT-AMA          | 19.1                     | 10.2                    | 174          |

**NOTE**

The above are exact values for the assumed conditions.

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

**Section V**  
**Performance**

Enter the graph for Descent at 11,500 feet to the descent line, and enter again at 3965 feet to the descent line, and read:

Time to Descend =  $(23-8) = 15$  min

Fuel Used to Descend =  $(6.9-2.2) = 4.7$  gal

Descent Distance =  $(72-24) = 48$  NM

Time and fuel used were calculated at Recommended Cruise Power - 24 in. Hg. 2300 RPM as follows:

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

$$\text{Fuel Used} = (\text{Time}) (\text{Total Fuel Flow})$$

Results are:

| ROUTE<br>SEGMENT | DISTANCE<br>NM | EST<br>GROUND<br>SPEED<br>KNOTS | TIME AT<br>CRUISE<br>ALTITUDE<br>HRS: MIN | FUEL<br>USED<br>FOR<br>CRUISE<br>GAL |
|------------------|----------------|---------------------------------|-------------------------------------------|--------------------------------------|
| DEN-COS          | *42            | 203                             | : 12                                      | 4.2                                  |
| COS-PUB          | 40             | 201                             | : 12                                      | 4.0                                  |
| PUB-TBE          | 74             | 159                             | : 28                                      | 9.4                                  |
| TBE-DHT          | 87             | 163                             | : 32                                      | 10.6                                 |
| DHT-AMA          | *17            | 165                             | : 06                                      | 2.0                                  |

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

**Section V**  
**Performance**

**BEECHCRAFT Baron B55**  
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**TIME - FUEL - DISTANCE**

| <b>ITEM</b>                            | <b>TIME<br/>HRS: MINS</b> | <b>FUEL<br/>GAL</b> | <b>DISTANCE<br/>NM</b> |
|----------------------------------------|---------------------------|---------------------|------------------------|
| Start, Runup,<br>Taxi and Take-<br>off | 0:00                      | 3.3                 | 0                      |
| Climb                                  | 0:06                      | 3.2                 | 13                     |
| Cruise                                 | 1:30                      | 30.2                | 260                    |
| Descent                                | 0:15                      | 4.7                 | 48                     |
| Total                                  | 1:51                      | 41.4                | 321                    |

Total Flight Time: 1 hour, 51 minutes

Block Speed:  $321 \text{ NM} \div 1 \text{ hour, 51 minutes} = 174 \text{ knots}$

Reserve Fuel: (45 minutes at Economy Cruise Power):

Enter the cruise power settings table for Economy Cruise Power at 11,500 feet for ISA (assume ISA Fuel Flow Rate).

Fuel Flow Per Engine = 9.0 gal/hr

Total Fuel Flow = 18.0 gal/hr (108 lbs/hr)

Reserve Fuel = (45 min) (108 lbs/hr) = 81 lbs (13.5 gal)

Total Fuel =  $41.4 + 13.5 = 54.9$  gallons



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

Assumed ramp weight = 5121 lbs

Estimated fuel from DEN to AMA = 41.4 gal (248 lbs)

Estimated landing weight = 5121 - 248 = 4873 lbs

Examples have been provided on the performance graphs. The above conditions have been used throughout. Rate of climb was determined for the initial cruise altitude conditions.

Enter the graph for Landing Distance - Flaps 30 degrees at 25°C, 3965 feet pressure altitude, 4873 pounds and 9.5 kts headwind component:

|                                          |         |
|------------------------------------------|---------|
| Ground Roll .....                        | 1500 ft |
| Total Distance over 50 ft Obstacle ..... | 2100 ft |
| Approach Speed .....                     | 87 kts  |

Enter the graph for Climb-Balked Landing at 25°C, 3965 feet pressure altitude and 4873 pounds:

|                      |            |
|----------------------|------------|
| Rate-of-Climb .....  | 570 ft/min |
| Climb Gradient ..... | 6.0%       |

**COMMENTS PERTINENT TO THE USE OF  
PERFORMANCE GRAPHS**

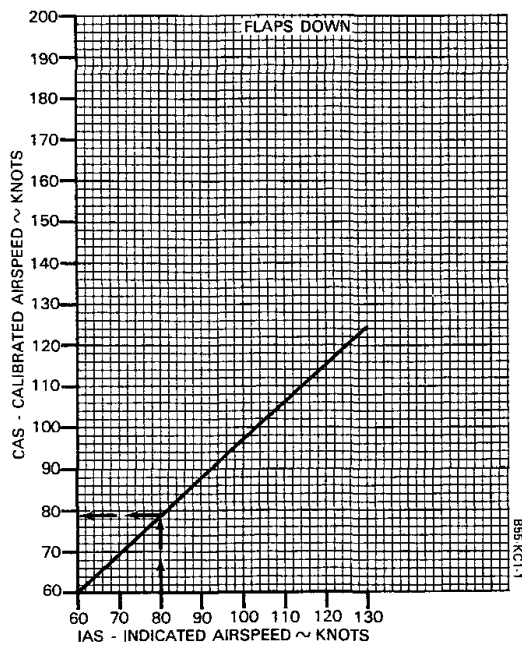
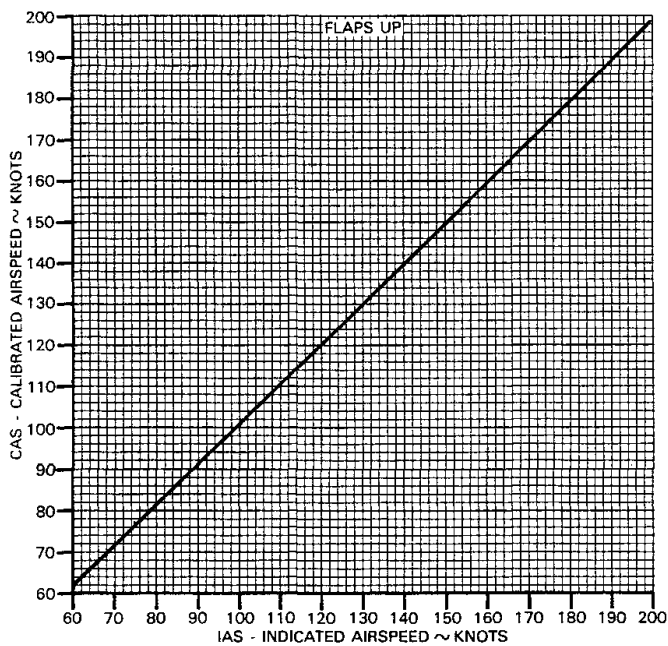
1. The example, in addition to presenting an answer for a particular set of conditions, also presents the order in which the graphs should normally be used, i.e., if the first item in the example is OAT, then enter the graph at the known OAT.
2. The reference lines indicate where to begin following guide lines. Always project to the reference line first, then follow the guide lines to the next known item.
3. Indicated airspeeds (IAS) were obtained by using the Airspeed Calibration-Normal System.
4. The associated conditions define the specific conditions from which performance parameters have been determined. They are not intended to be used as instructions; however, performance values determined from charts can only be achieved if specified conditions exist.
5. The full amount of usable fuel is available for all approved flight conditions.

# **AIRSPEED CALIBRATION - NORMAL SYSTEM**

NOTE: INDICATED AIRSPEED ASSUMES ZERO INSTRUMENT ERROR

EXAMPLE:

|       |          |
|-------|----------|
| IAS   | 80 KNOTS |
| FLAPS | DOWN     |
| CAS   | 79 KNOTS |

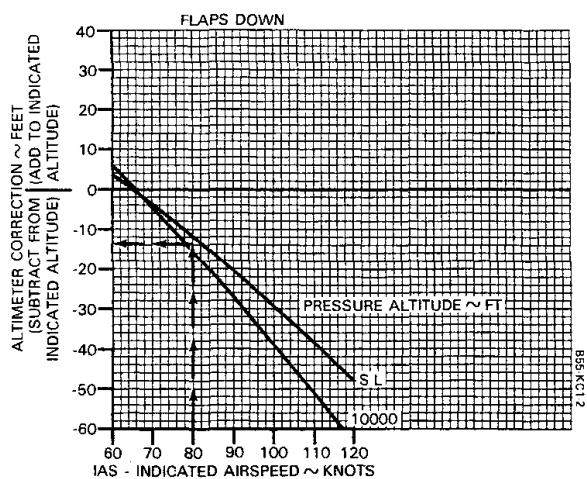
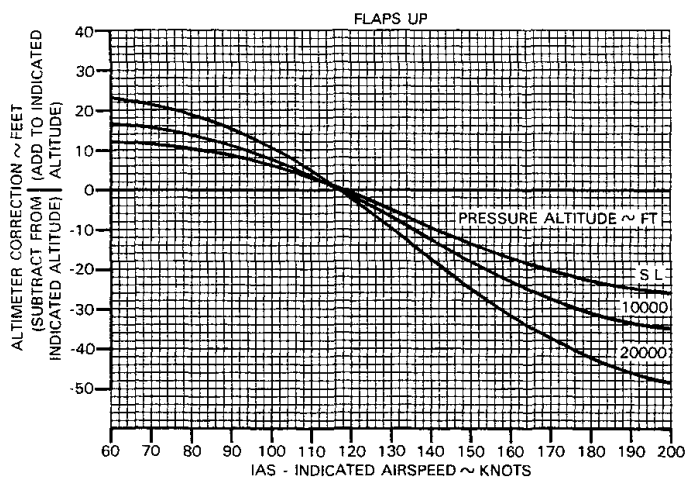


# ALTIMETER CORRECTION - NORMAL SYSTEM

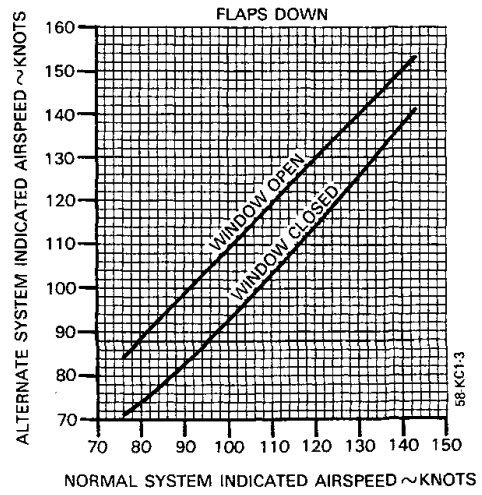
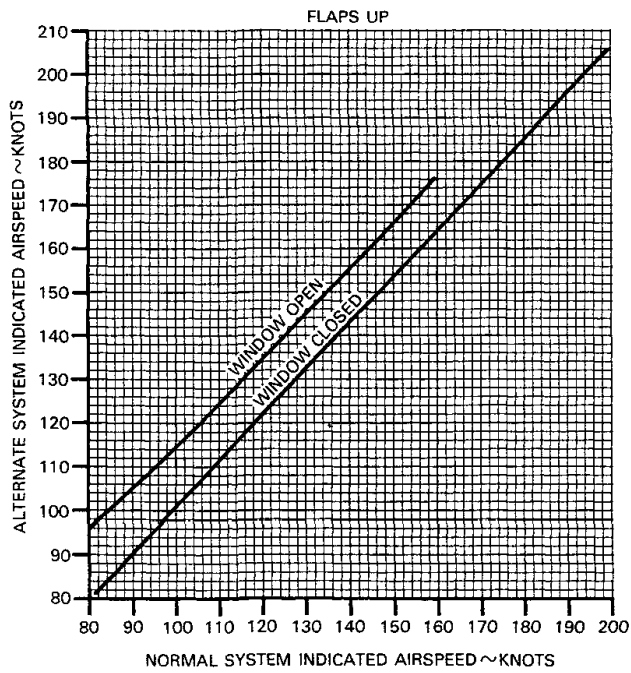
NOTE  
INDICATED ALTITUDE AND INDICATED AIRSPEED  
ASSUME ZERO INSTRUMENT ERROR

## EXAMPLE

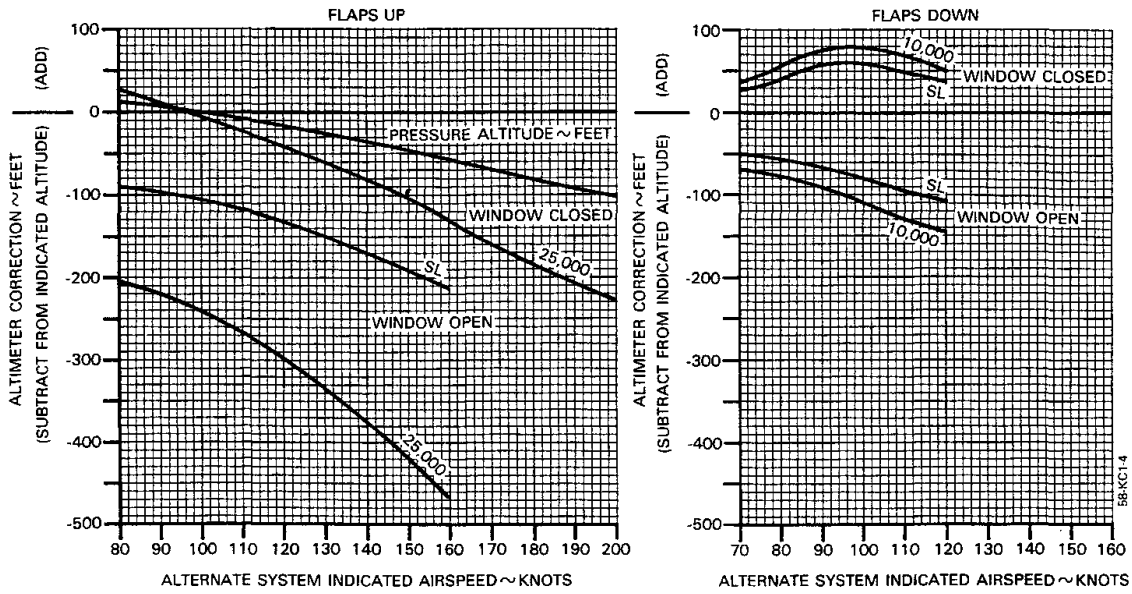
|                             |                         |
|-----------------------------|-------------------------|
| IAS                         | 80 KNOTS                |
| FLAPS                       | DOWN                    |
| INDICATED PRESSURE ALTITUDE | 5000 FT                 |
| ALTIMETER CORRECTION        | - 14 FT                 |
| ACTUAL PRESSURE ALTITUDE    | $(5000 - 14) = 4986$ FT |

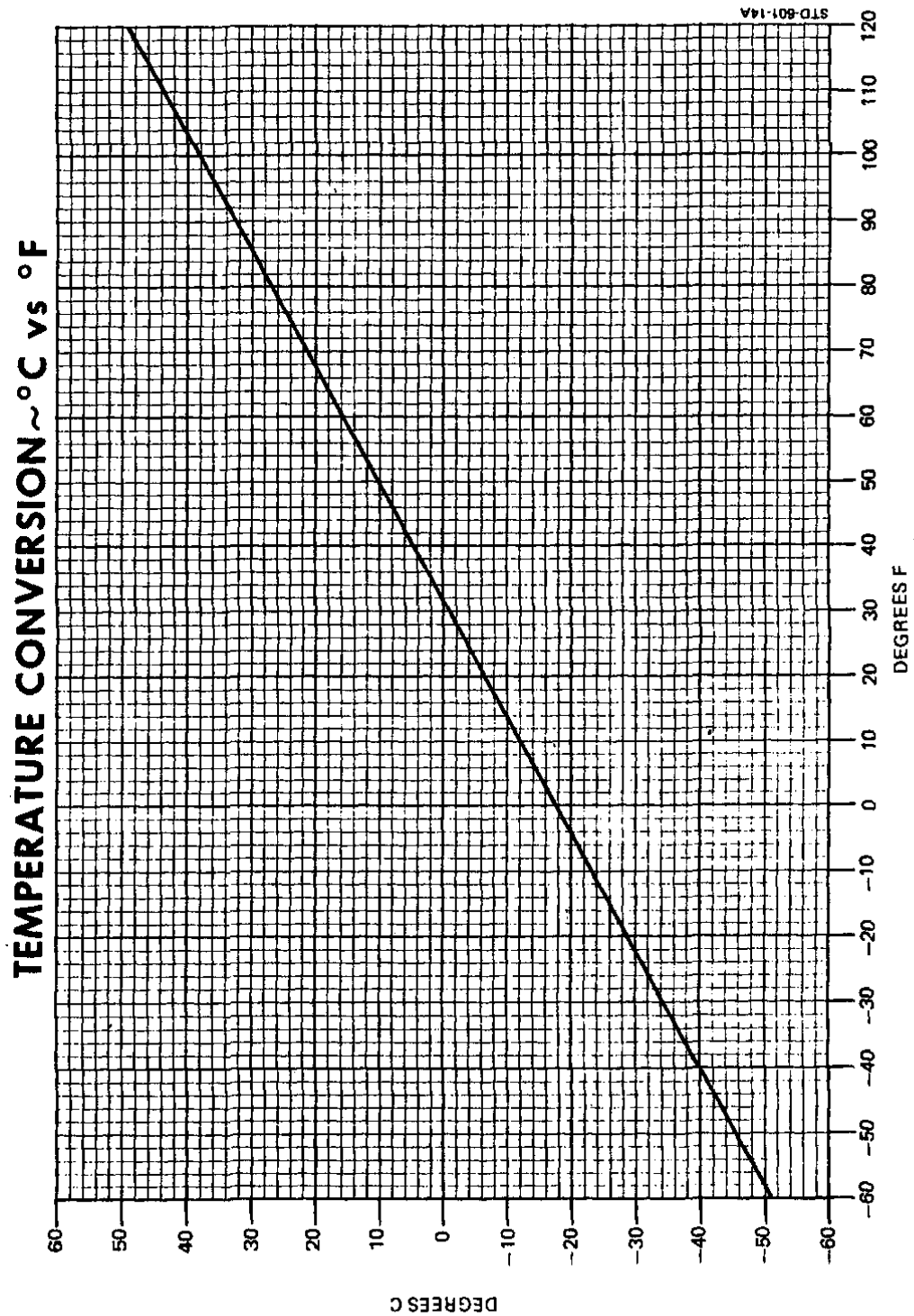


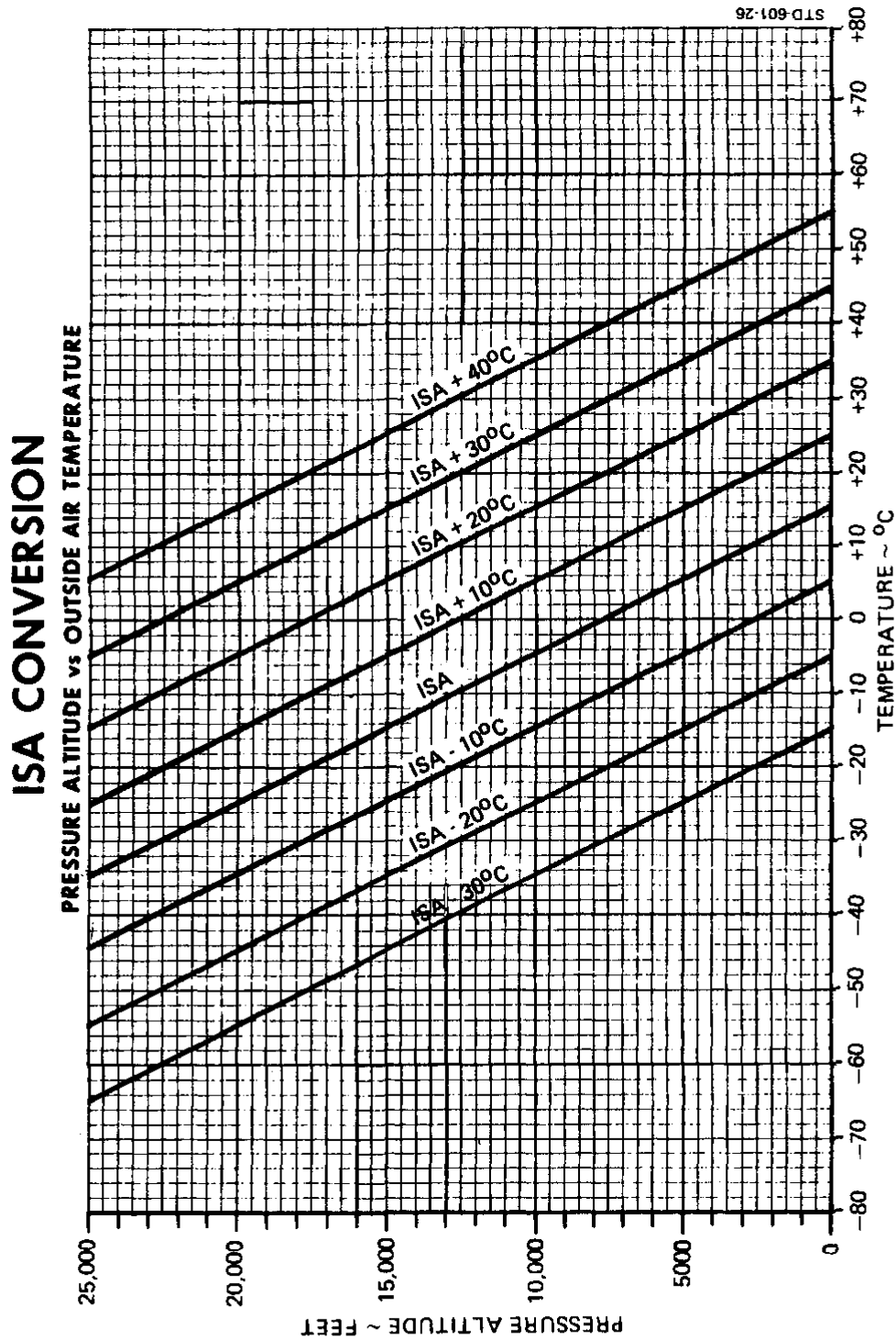
## AIRSPEED CALIBRATION - ALTERNATE SYSTEM



## ALTIMETER CORRECTION - ALTERNATE SYSTEM





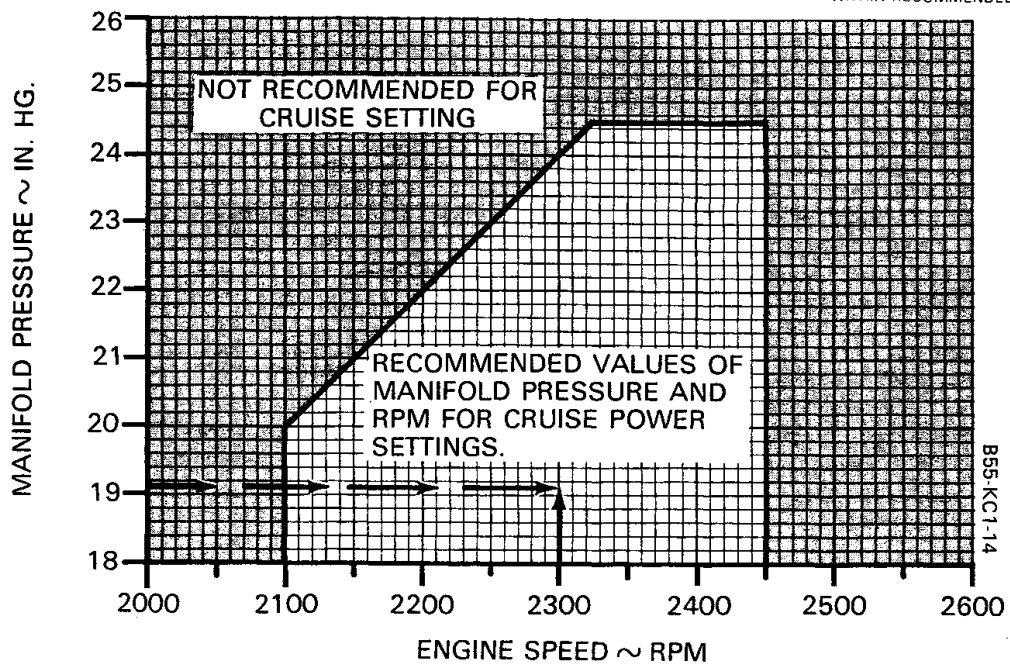




# MANIFOLD PRESSURE vs RPM

## EXAMPLE

|                           |             |
|---------------------------|-------------|
| ENGINE SPEED              | 2300 RPM    |
| MANIFOLD PRESSURE         | 19.1 IN. HG |
| WITHIN RECOMMENDED LIMITS |             |



BEECHCRAFT Baron B55  
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Section V  
Performance

## Section V Performance

## BEECHCRAFT Baron B55 Serial TC 2003 and After

### TAKE-OFF WEIGHT

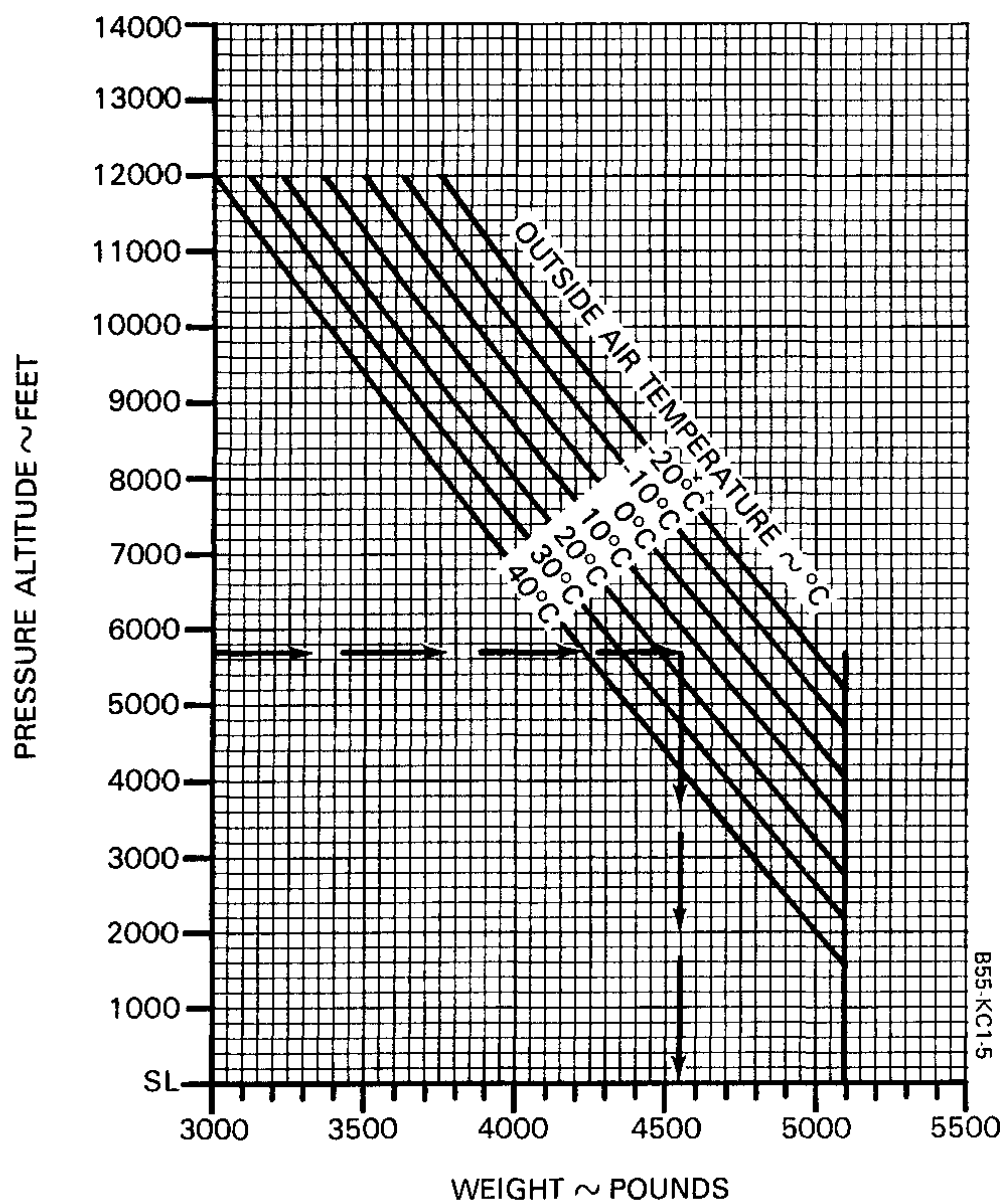
TO ACHIEVE POSITIVE SINGLE ENGINE  
RATE-OF-CLIMB AT LIFT-OFF

#### ASSOCIATED CONDITIONS:

|              |                      |
|--------------|----------------------|
| AIRPLANE     | AIRBORNE             |
| POWER        | TAKE-OFF AT 2625 RPM |
| FLAPS        | UP                   |
| LANDING GEAR | DOWN                 |
| INOPERATIVE  |                      |
| PROPELLER    | FEATHERED            |

#### EXAMPLE:

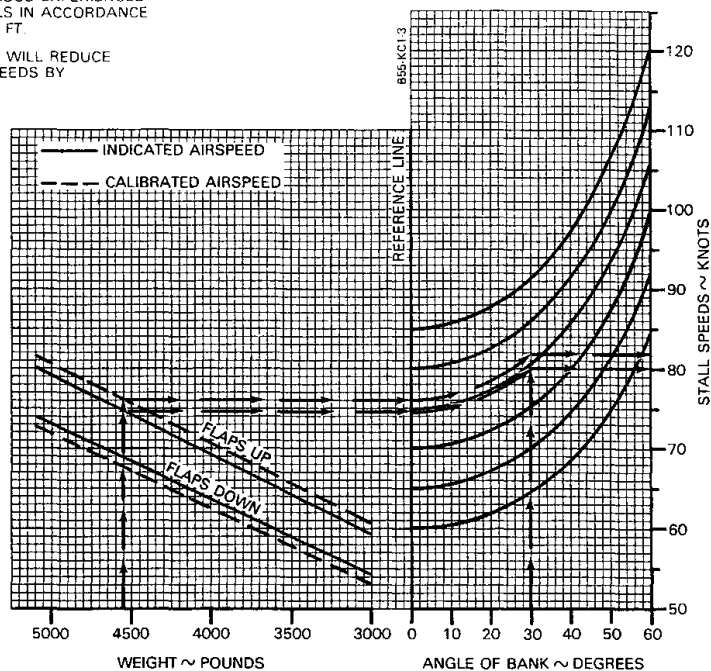
|                   |          |
|-------------------|----------|
| PRESSURE ALTITUDE | 5650 FT  |
| OAT               | 15°C     |
| TAKE-OFF WEIGHT   | 4550 LBS |



# STALL SPEEDS - POWER IDLE

## NOTES:

1. THE MAXIMUM ALTITUDE LOSS EXPERIENCED WHILE CONDUCTING STALLS IN ACCORDANCE WITH CAM 3.120 WAS 350 FT.
2. ZERO THRUST CONDITIONS WILL REDUCE THE POWER-OFF STALL SPEEDS BY APPROXIMATELY 4 KNOTS.



## EXAMPLE

|               |                          |
|---------------|--------------------------|
| WEIGHT        | 4550 LBS                 |
| FLAPS         | UP                       |
| ANGLE OF BANK | 30°                      |
| STALL SPEED   | CAS 82 KTS<br>IAS 80 KTS |

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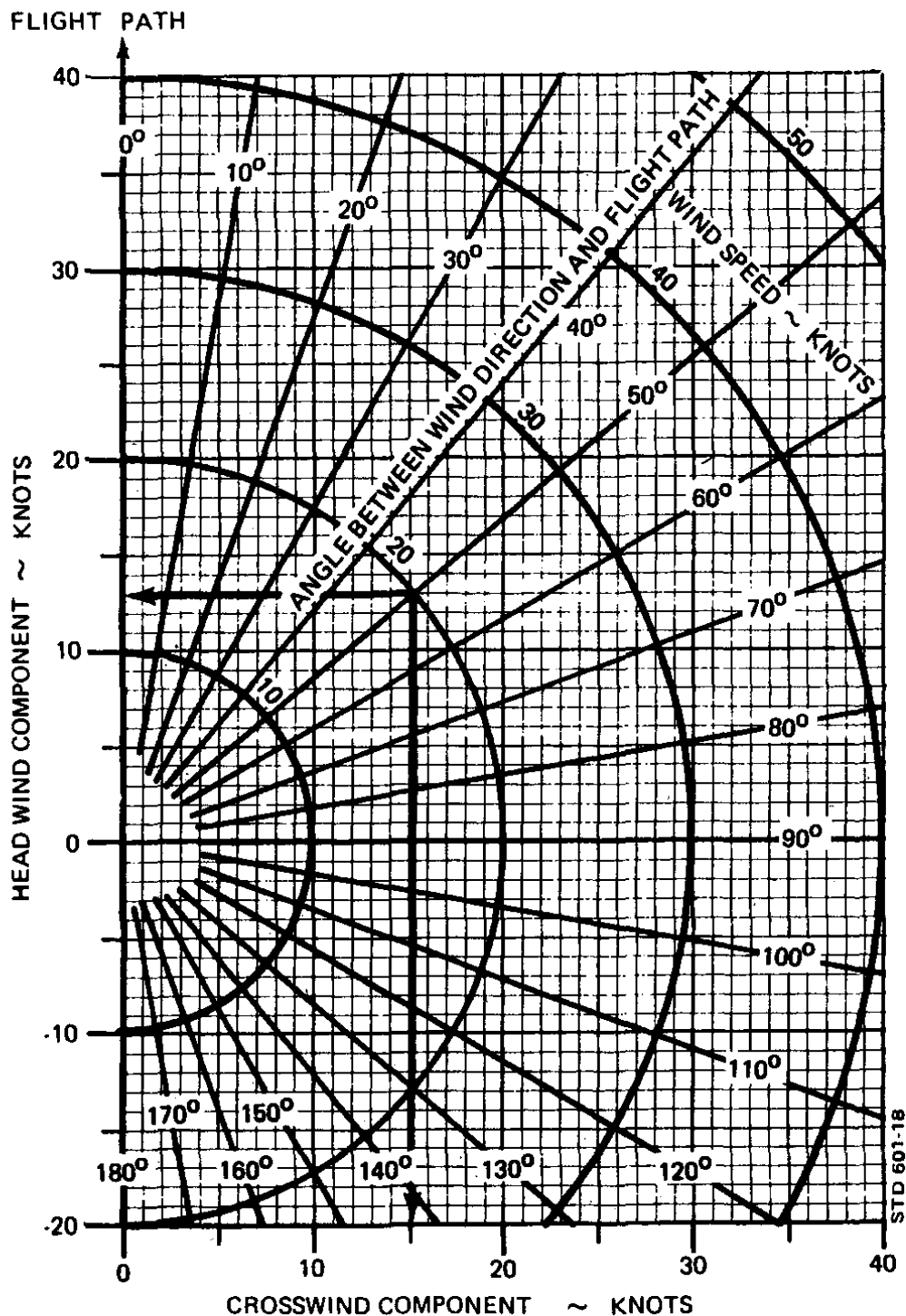
Section V  
Performance

## WIND COMPONENTS

Demonstrated Crosswind Component is 22 kts

EXAMPLE:

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



# ASSOCIATED CONDITIONS

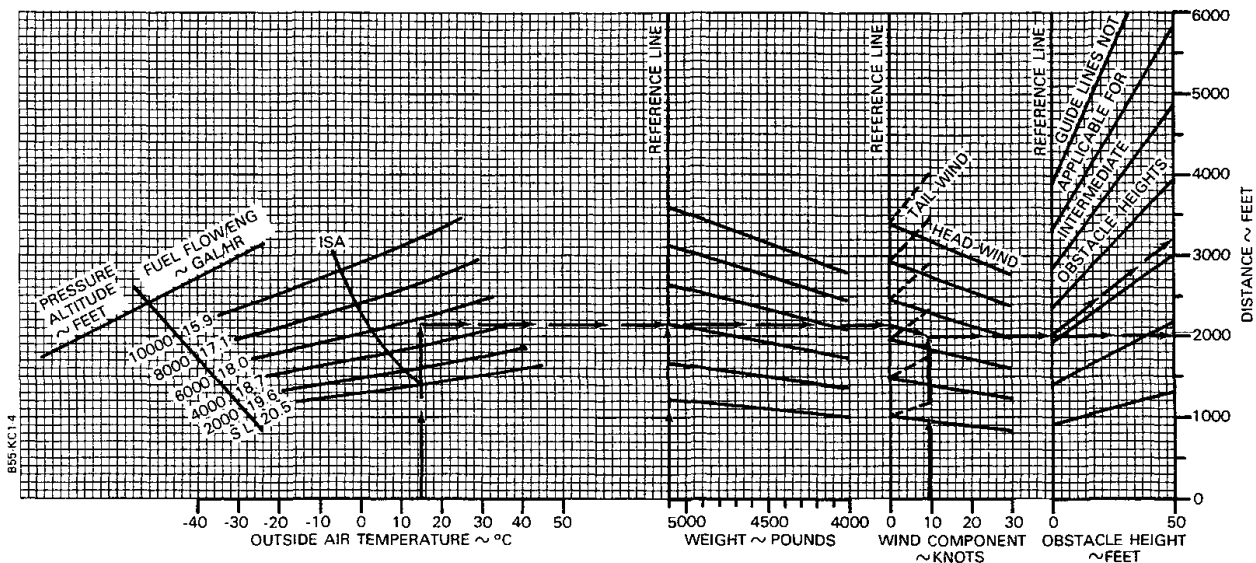
POWER TAKE-OFF AT 2625 RPM  
 MIXTURE LEAN TO APPROPRIATE FUEL FLOW  
 FLAPS UP  
 LANDING GEAR RETRACT AFTER POSITIVE CLIMB ESTABLISHED  
 COWL FLAPS OPEN  
 RUNWAY PAVED, LEVEL, DRY SURFACE

## TAKE-OFF DISTANCE

LIFT-OFF SPEED (ALL WEIGHTS)  
 84 KNOTS  
 50 FT SPEED (ALL WEIGHTS)  
 91 KNOTS

### EXAMPLE:

|                                    |          |
|------------------------------------|----------|
| OAT                                | 15°C     |
| PRESSURE ALTITUDE                  | 5650 FT  |
| TAKE-OFF WEIGHT                    | 5100 LBS |
| HEAD WIND COMPONENT                | 9.5 KTS  |
| GROUND ROLL                        | 2000 FT  |
| TOTAL DISTANCE OVER 50 FT OBSTACLE | 3200 FT  |
| TAKE-OFF SPEED AT 50 FT            | 84 KTS   |
|                                    | 91 KTS   |



BEECHCRAFT Baron B55  
 Serial TC 2003 and After

Section V  
 Performance

ACCELERATE - STOP DISTANCE

ASSOCIATED CONDITIONS

POWER 1. TAKE-OFF POWER AT 2625 RPM SET  
BEFORE BRAKE  
RELEASE  
2. ENGINES IDLE AT  
DECISION SPEED  
FLAPS UP (0°)  
RUNWAY PAVED, LEVEL, DRY SURFACE  
COWL FLAPS OPEN

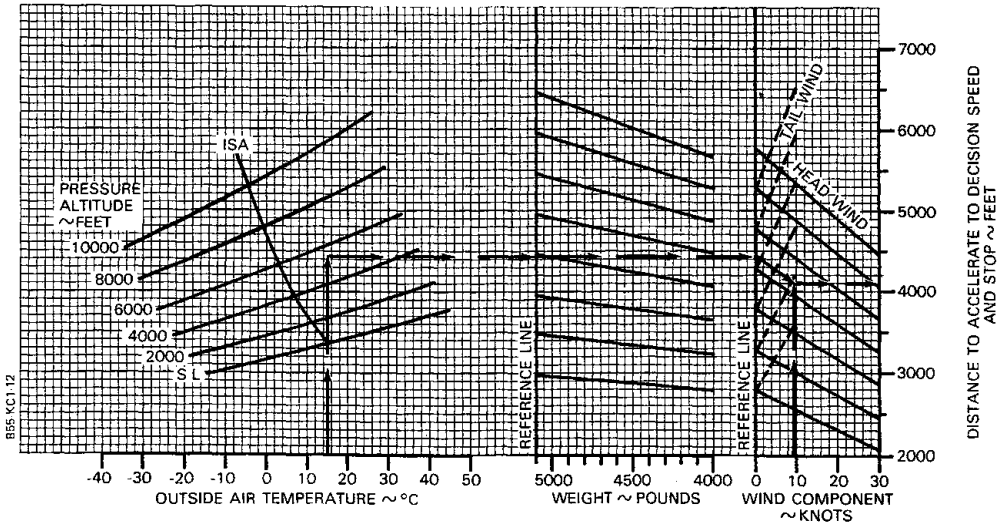
DECISION SPEED (ALL WEIGHTS)  
84 KNOTS

EXAMPLE

OAT 15°C  
PRESSURE ALTITUDE 5650 FT  
TAKE-OFF WEIGHT 5100 LBS  
HEAD WIND 9.5 KTS  
ACCELERATE AND STOP DISTANCE 4100 FT  
IAS DECISION SPEED 84 KTS

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Performance

BEECHCRAFT Baron B55  
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ACCELERATE - GO DISTANCE

ASSOCIATED CONDITIONS

|              |                                                     |
|--------------|-----------------------------------------------------|
| POWER        | TAKE-OFF POWER AT 2625 RPM SET BEFORE BRAKE RELEASE |
| FLAPS        | UP (0°)                                             |
| LANDING GEAR | RETRACT AFTER LIFT-OFF                              |
| RUNWAY       | PAVED, LEVEL, DRY SURFACE                           |
| COWL FLAPS   | OPEN                                                |

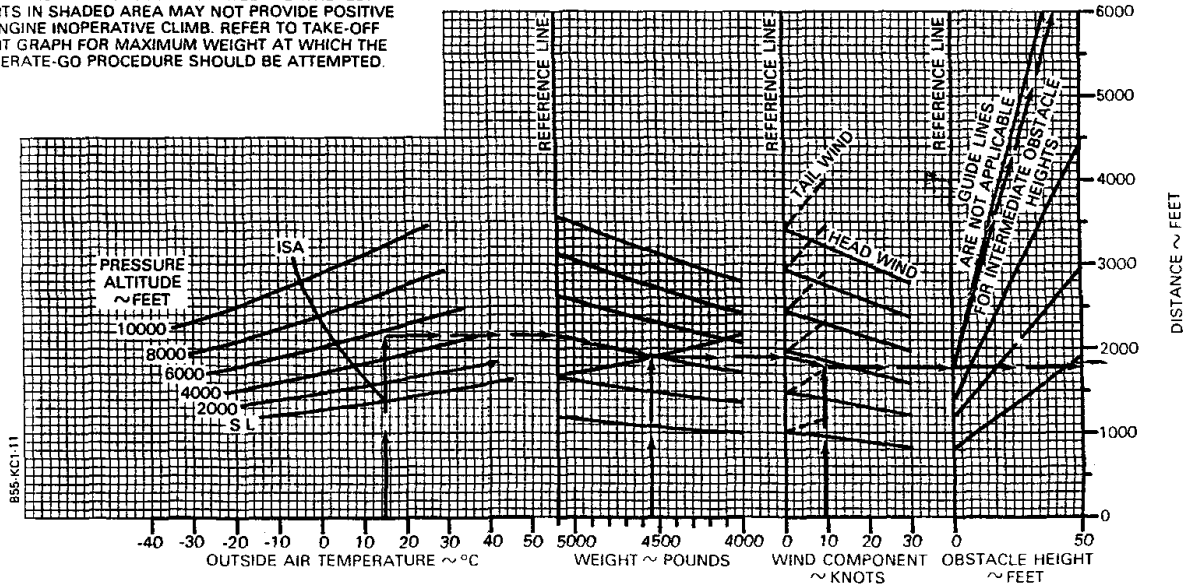
|                              |          |
|------------------------------|----------|
| LIFT-OFF SPEED (ALL WEIGHTS) | 84 KNOTS |
| 50 FT SPEED (ALL WEIGHTS)    | 91 KNOTS |

EXAMPLE

|                                    |          |
|------------------------------------|----------|
| OAT                                | 15°C     |
| PRESSURE ALTITUDE                  | 5650 FT  |
| TAKE-OFF WEIGHT                    | 4550 LBS |
| HEAD WIND COMPONENT                | 9.5 KTS  |
| GROUND ROLL                        | 1800 FT  |
| TOTAL DISTANCE OVER 50 FT OBSTACLE | 7100 FT  |

NOTES

- 1 DISTANCES ASSUME AN ENGINE FAILURE AT LIFT-OFF AND PROPELLER IMMEDIATELY FEATHERED.
- 2 WEIGHTS IN SHADED AREA MAY NOT PROVIDE POSITIVE ONE ENGINE INOPERATIVE CLIMB. REFER TO TAKE-OFF WEIGHT GRAPH FOR MAXIMUM WEIGHT AT WHICH THE ACCELERATE-GO PROCEDURE SHOULD BE ATTEMPTED.



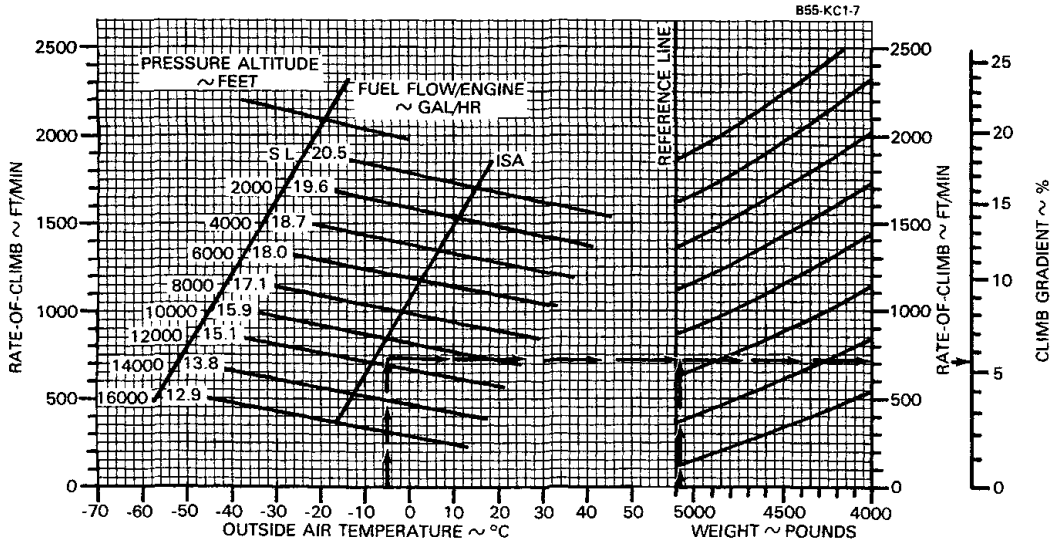
ASSOCIATED CONDITIONS:

POWER MAXIMUM CONTINUOUS  
AT 2625 RPM  
FLAPS UP  
LANDING GEAR UP  
COWL FLAPS OPEN  
MIXTURE LEAN TO APPROPRIATE  
FUEL FLOW

CLIMB - TWO ENGINE  
(TC-2003 thru TC-2284)  
CLIMB SPEED 107 KNOTS (ALL WEIGHTS)

EXAMPLE:

OAT -5°C  
PRESSURE ALTITUDE 11500 FT  
WEIGHT 5081 LBS  
RATE-OF-CLIMB 720 FT/MIN  
CLIMB GRADIENT 5.5%



Section V  
Performance

BEECHCRAFT Baron B55  
Serial TC 2003 and After



# CLIMB - TWO ENGINE

(TC-2285 and After)

CLIMB SPEED 107 KNOTS

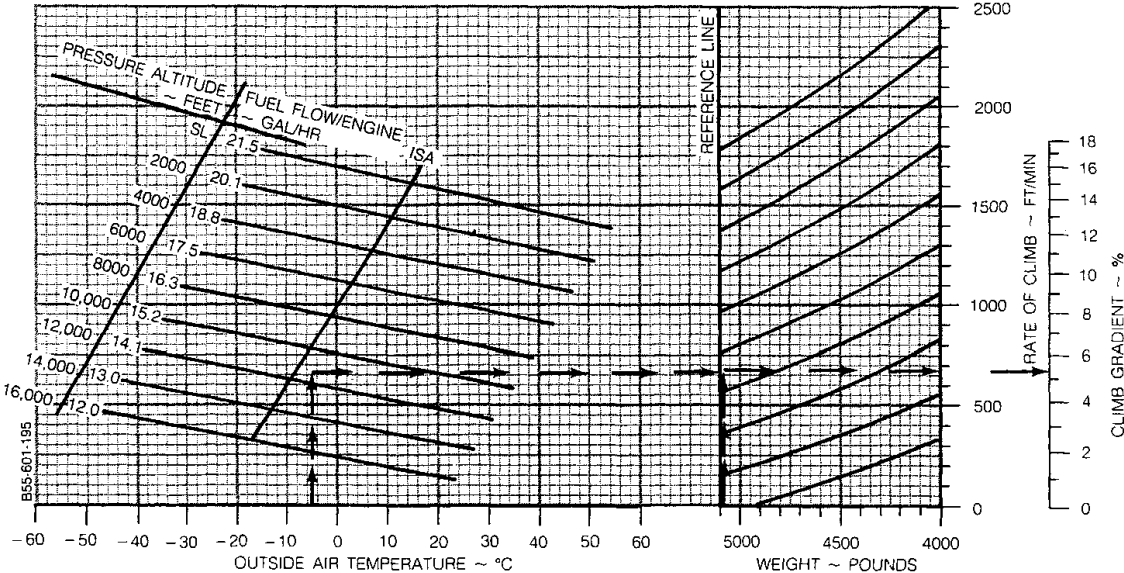
(ALL WEIGHTS)

ASSOCIATED CONDITIONS:

POWER ..... FULL THROTTLE AT 2550 RPM  
FLAPS ..... UP  
LANDING GEAR ..... UP  
COWL FLAPS ..... OPEN  
MIXTURE ..... LEAN TO APPROPRIATE  
FUEL FLOW

EXAMPLE:

OAT ..... -5°C  
PRESSURE ALTITUDE ..... 11,500 FT  
WEIGHT ..... 5081 LBS  
RATE OF CLIMB ..... 680 FT/MIN  
CLIMB GRADIENT ..... 5.3%



**INTENTIONALLY LEFT BLANK**

TAKE-OFF CLIMB GRADIENT - ONE ENGINE INOPERATIVE

ASSOCIATED CONDITIONS

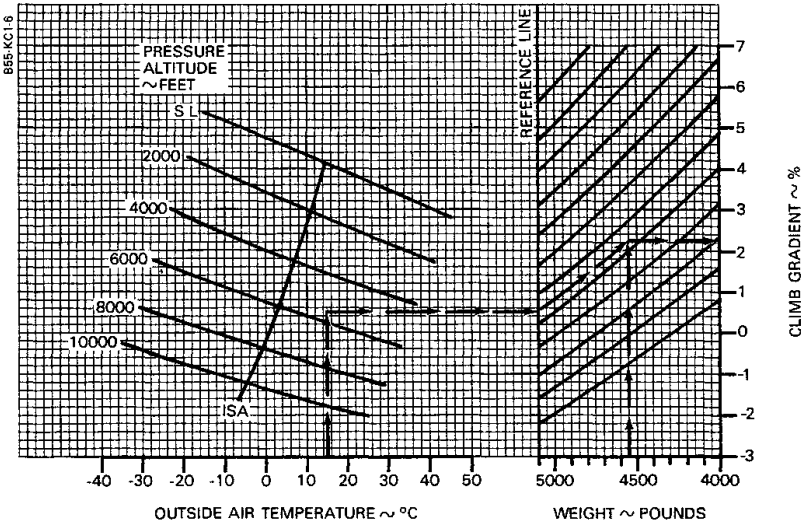
POWER TAKE-OFF AT 2625 RPM  
LANDING GEAR UP  
FLAPS UP  
INOPERATIVE PROPELLER FEATHERED  
COWL FLAPS OPEN

CLIMB SPEED (ALL WEIGHTS)

91 KNOTS

EXAMPLE:

OAT 15°C  
PRESSURE ALTITUDE 5650 FT  
WEIGHT 4550 LBS  
GRADIENT OF CLIMB 2.2%  
CLIMB SPEED 91 KTS



TIME, FUEL AND DISTANCE TO CLIMB

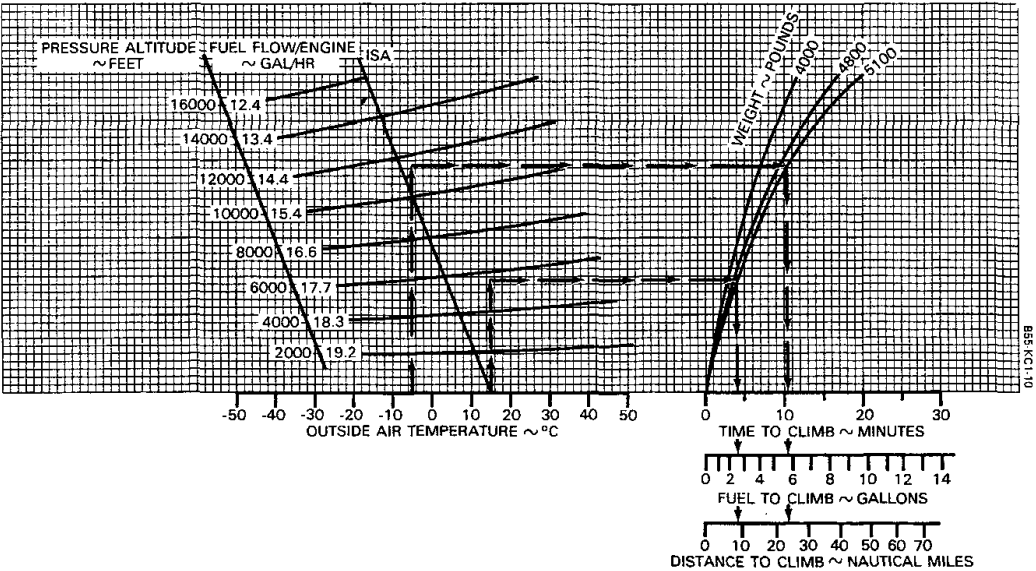
ASSOCIATED CONDITIONS:

POWER 25 IN. HG OR FULL THROTTLE  
2500 RPM  
FUEL DENSITY 6.0 LB/GAL  
MIXTURE LEAN TO APPROPRIATE FUEL FLOW  
COWL FLAPS AS REQUIRED

CLIMB SPEED - 122 KNOTS

EXAMPLE

OAT AT TAKE-OFF 15°C  
OAT AT CRUISE -5°C  
AIRPORT PRESSURE ALTITUDE 5650 FT  
CRUISE PRESSURE ALTITUDE 11500 FT  
INITIAL CLIMB WEIGHT 5100 LBS  
TIME TO CLIMB 10 - 4 = 6 MIN  
FUEL TO CLIMB 5.7 - 2.5 = 3.2 GAL  
DISTANCE TO CLIMB 22 - 9 = 13 NM



Section V  
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BEECHCRAFT Baron B55  
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# CLIMB - ONE ENGINE INOPERATIVE

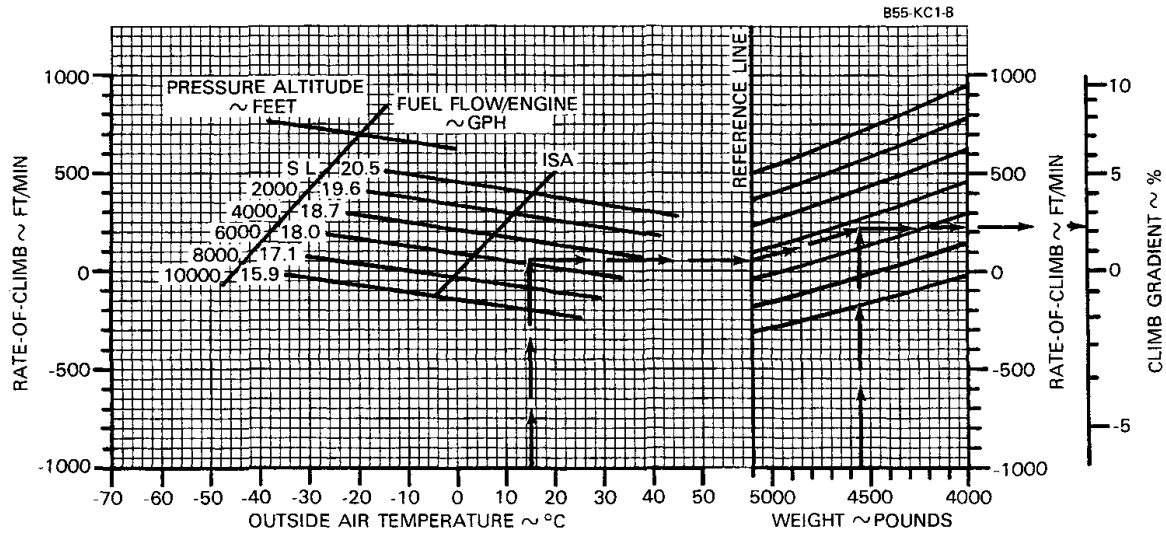
## ASSOCIATED CONDITIONS:

POWER MAXIMUM CONTINUOUS AT 2625 RPM  
 FLAPS UP  
 LANDING GEAR UP  
 INOPERATIVE PROPELLER FEATHERED  
 COWL FLAPS OPEN  
 MIXTURE LEAN TO APPROPRIATE  
 FUEL FLOW FUEL FLOW

CLIMB SPEED 99 KNOTS (ALL WEIGHTS)

## EXAMPLE

OAT 15°C  
 PRESSURE ALTITUDE 5650 FT  
 WEIGHT 4550 LBS  
 RATE OF CLIMB 230 FT/MIN  
 CLIMB GRADIENT 2.3%



BEECHCRAFT Baron B55  
 Serial TC 2003 and After

Section V  
 Performance

## Section V Performance

## BEECHCRAFT Baron B55 Serial TC 2003 and After

### SERVICE CEILING - ONE ENGINE INOPERATIVE

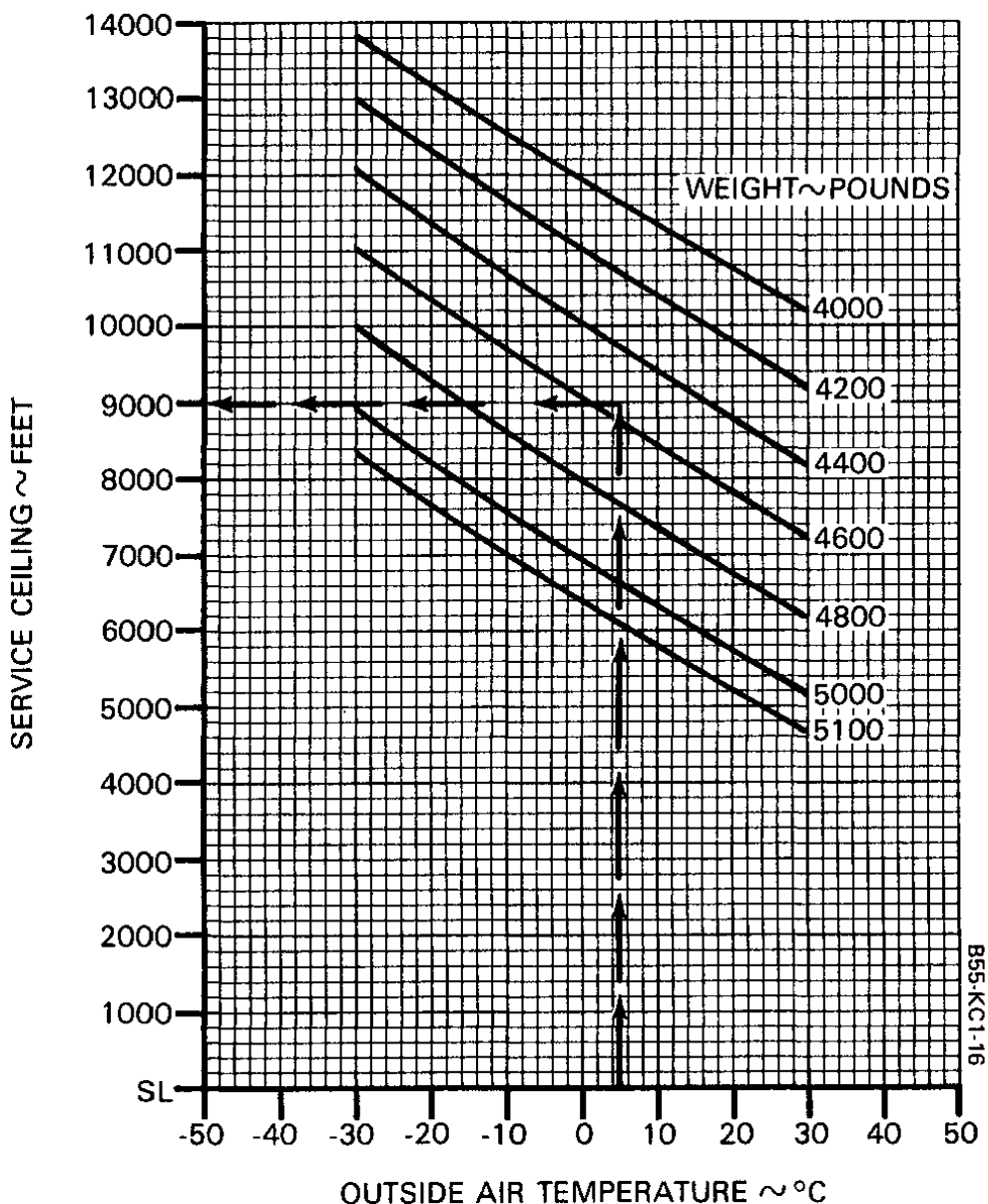
#### ASSOCIATED CONDITIONS:

POWER MAXIMUM CONTINUOUS  
AT 2625 RPM  
LANDING GEAR UP  
INOPERATIVE PROPELLER FEATHERED  
FLAPS UP

#### EXAMPLE:

OAT 5°C  
WEIGHT 4550 LBS  
SERVICE CEILING 9000 FT

NOTE:  
SERVICE CEILING IS THE PRESSURE ALTITUDE WHERE  
AIRPLANE HAS CAPABILITY OF CLIMBING 50 FT/MINUTE  
WITH ONE PROPELLER FEATHERED.



# BEECHCRAFT Baron B55 Serial TC 2003 and After

## Section V Performance

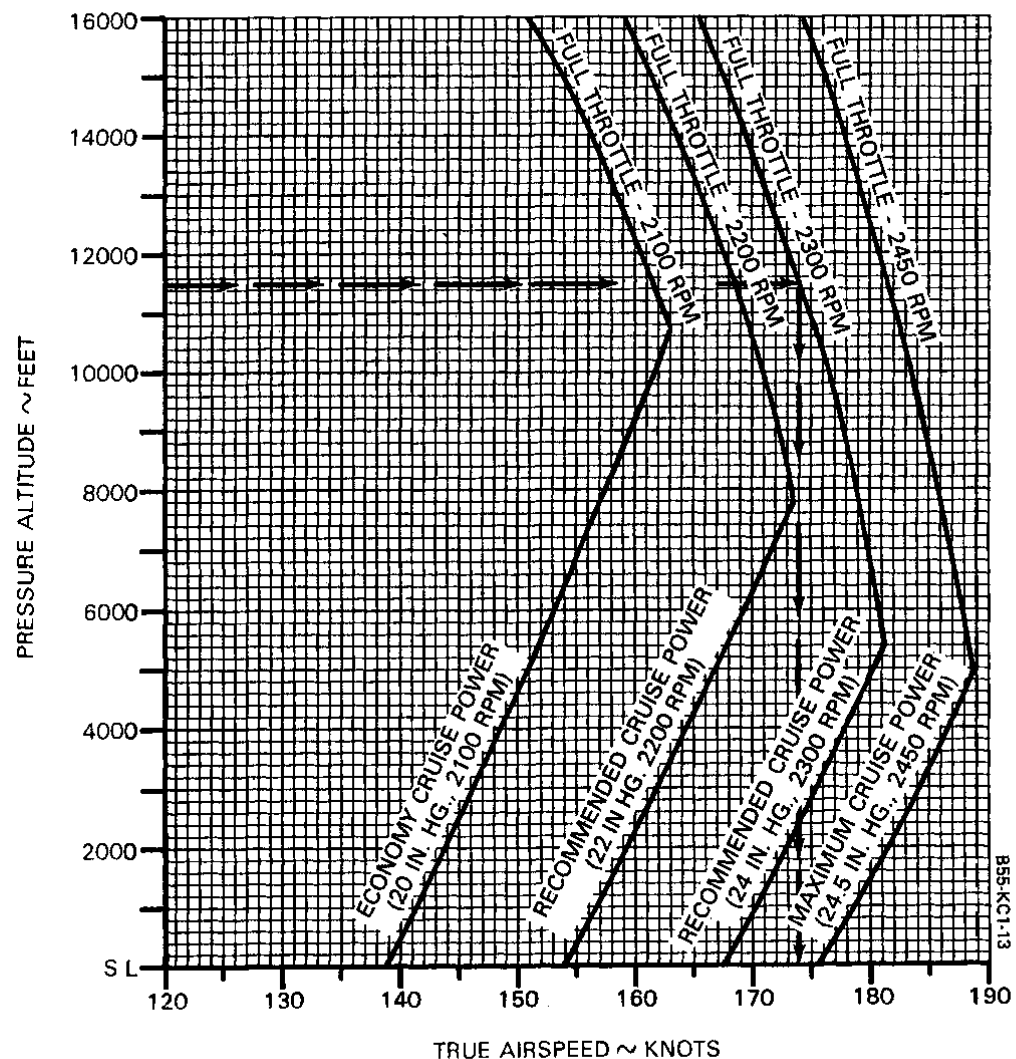
### CRUISE SPEEDS

#### ASSOCIATED CONDITIONS:

AVERAGE CRUISE WEIGHT 4900 LBS  
TEMPERATURE STANDARD DAY (ISA)

#### EXAMPLE:

PRESSURE ALTITUDE 11500 FT  
POWER SETTING FULL THROTTLE  
2300 RPM  
TRUE AIRSPEED 174 KNOTS



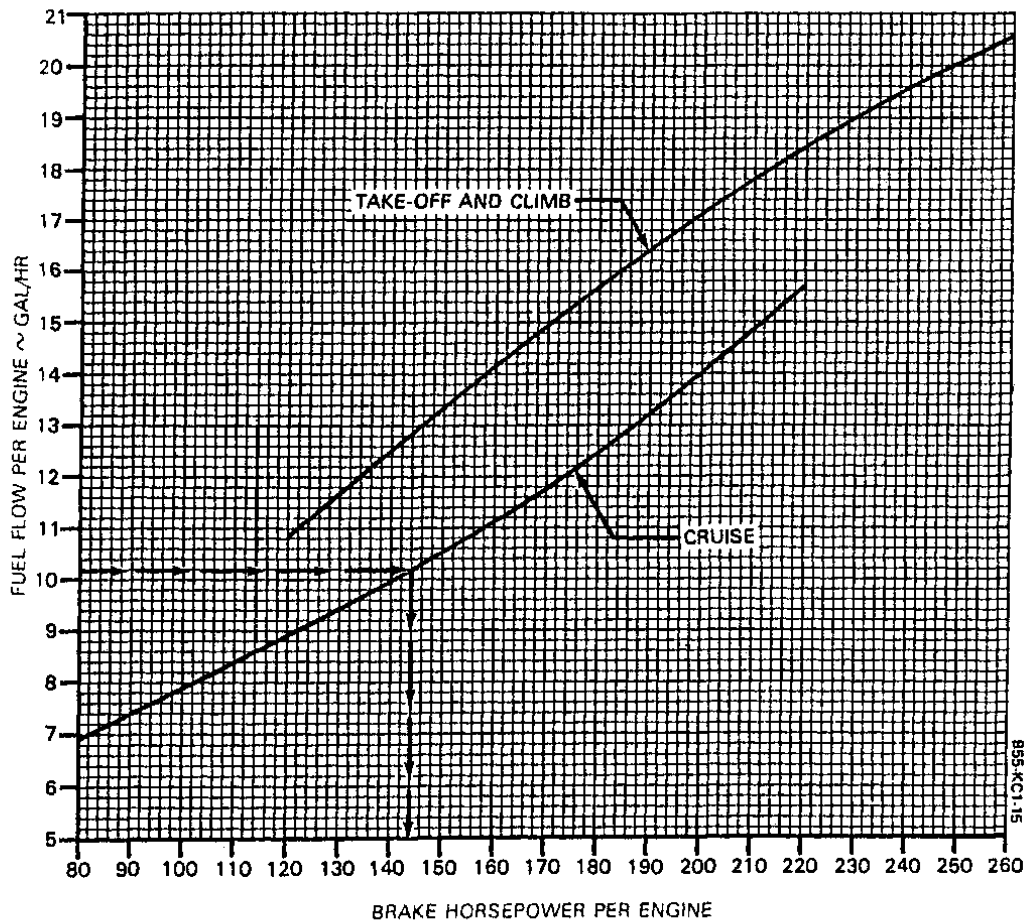
Section V  
Performance

BEECHCRAFT Baron B55  
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FUEL FLOW vs BRAKE HORSEPOWER

EXAMPLE

|                                |                                            |
|--------------------------------|--------------------------------------------|
| FUEL FLOW ENGINE<br>CONDITION  | 10.2 GAL/HR<br>LEVEL FLIGHT<br>CRUISE LEAN |
| BRAKE HORSEPOWER<br>PER ENGINE | 144 HP                                     |





**CRUISE POWER SETTINGS**  
**MAXIMUM CRUISE POWER**  
**24.5 IN. HG. 2450 RPM (OR FULL THROTTLE)**  
**4900 LBS.**

|                    | PRESS<br>ALT. | IOAT |     | ENGINE<br>SPEED | MAN.<br>PRESS | FUEL<br>FLOW/<br>ENGINE |      | TAS | CAS |
|--------------------|---------------|------|-----|-----------------|---------------|-------------------------|------|-----|-----|
|                    | FEET          | °F   | °C  | RPM             | IN HG         | PPH                     | GPH  | KTS | KTS |
| ISA -36°F (-20°C)  | SL            | 28   | -2  | 2450            | 24.5          | 83                      | 13.9 | 174 | 180 |
|                    | 2000          | 21   | -6  | 2450            | 24.5          | 86                      | 14.5 | 180 | 181 |
|                    | 4000          | 15   | -10 | 2450            | 24.5          | 89                      | 14.9 | 185 | 181 |
|                    | 6000          | 8    | -14 | 2450            | 23.3          | 85                      | 14.3 | 186 | 177 |
|                    | 8000          | 0    | -18 | 2450            | 21.6          | 79                      | 13.2 | 184 | 170 |
|                    | 10000         | -7   | -22 | 2450            | 20.1          | 72                      | 12.1 | 182 | 163 |
|                    | 12000         | -14  | -26 | 2450            | 18.7          | 67                      | 11.2 | 179 | 156 |
|                    | 14000         | -22  | -30 | 2450            | 17.2          | 63                      | 10.5 | 177 | 149 |
|                    | 16000         | -29  | -34 | 2450            | 16.1          | 59                      | 9.9  | 173 | 142 |
| STANDARD DAY (ISA) | SL            | 64   | 18  | 2450            | 24.5          | 80                      | 13.4 | 176 | 175 |
|                    | 2000          | 58   | 14  | 2450            | 24.5          | 83                      | 13.9 | 182 | 176 |
|                    | 4000          | 51   | 10  | 2450            | 24.5          | 86                      | 14.3 | 187 | 176 |
|                    | 6000          | 44   | 7   | 2450            | 23.3          | 82                      | 13.8 | 188 | 172 |
|                    | 8000          | 37   | 3   | 2450            | 21.6          | 76                      | 12.7 | 186 | 165 |
|                    | 10000         | 29   | -2  | 2450            | 20.1          | 70                      | 11.7 | 184 | 158 |
|                    | 12000         | 22   | -6  | 2450            | 18.7          | 65                      | 10.9 | 181 | 151 |
|                    | 14000         | 15   | -10 | 2450            | 17.2          | 61                      | 10.2 | 178 | 144 |
|                    | 16000         | 7    | -14 | 2450            | 16.1          | 57                      | 9.6  | 174 | 137 |
| ISA +36°F (+20°C)  | SL            | 100  | 38  | 2450            | 24.5          | 77                      | 12.9 | 177 | 171 |
|                    | 2000          | 94   | 34  | 2450            | 24.5          | 80                      | 13.4 | 183 | 172 |
|                    | 4000          | 87   | 31  | 2450            | 24.5          | 82                      | 13.8 | 188 | 172 |
|                    | 6000          | 80   | 27  | 2450            | 23.3          | 79                      | 13.2 | 189 | 167 |
|                    | 8000          | 73   | 23  | 2450            | 21.6          | 73                      | 12.2 | 187 | 161 |
|                    | 10000         | 65   | 19  | 2450            | 20.1          | 68                      | 11.3 | 185 | 154 |
|                    | 12000         | 58   | 14  | 2450            | 18.7          | 63                      | 10.6 | 182 | 146 |
|                    | 14000         | 51   | 10  | 2450            | 17.2          | 59                      | 9.9  | 178 | 139 |
|                    | 16000         | 43   | 6   | 2450            | 16.1          | 55                      | 9.4  | 174 | 131 |

- NOTES: 1. FULL THROTTLE MANIFOLD PRESSURE  
 SETTINGS ARE APPROXIMATE  
 2. SHADED AREA REPRESENTS OPERATION  
 WITH FULL THROTTLE

**Section V**  
**Performance**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

**CRUISE POWER SETTINGS**  
**RECOMMENDED CRUISE POWER**  
**24.0 IN. HG. 2300 RPM (OR FULL THROTTLE)**  
**4900 LBS.**

|                    | PRESS<br>ALT. | OAT |     | ENGINE<br>SPEED | MAN.<br>PRESS | FUEL<br>FLOW/<br>ENGINE |      | TAS | CAS |
|--------------------|---------------|-----|-----|-----------------|---------------|-------------------------|------|-----|-----|
|                    | FEET          | °F  | °C  | RPM             | IN HG         | PPH                     | GPH  | KTS | KTS |
| ISA -36°F (-20°C)  | SL            | 28  | -2  | 2300            | 24.0          | 72                      | 12.1 | 166 | 172 |
|                    | 2000          | 21  | -6  | 2300            | 24.0          | 74                      | 12.5 | 171 | 172 |
|                    | 4000          | 14  | -10 | 2300            | 24.0          | 77                      | 12.9 | 176 | 173 |
|                    | 6000          | 7   | -14 | 2300            | 23.4          | 76                      | 12.7 | 179 | 170 |
|                    | 8000          | -1  | -18 | 2300            | 21.7          | 70                      | 11.8 | 177 | 163 |
|                    | 10000         | -7  | -22 | 2300            | 20.2          | 66                      | 11.0 | 175 | 157 |
|                    | 12000         | -15 | -26 | 2300            | 18.7          | 62                      | 10.3 | 172 | 149 |
|                    | 14000         | -22 | -30 | 2300            | 17.3          | 58                      | 9.7  | 170 | 142 |
|                    | 16000         | -29 | -34 | 2300            | 16.0          | 55                      | 9.1  | 165 | 135 |
| STANDARD DAY (ISA) | SL            | 64  | 18  | 2300            | 24.0          | 70                      | 11.7 | 168 | 168 |
|                    | 2000          | 57  | 14  | 2300            | 24.0          | 72                      | 12.0 | 173 | 168 |
|                    | 4000          | 50  | 10  | 2300            | 24.0          | 74                      | 12.4 | 178 | 168 |
|                    | 6000          | 43  | 6   | 2300            | 23.4          | 73                      | 12.3 | 181 | 166 |
|                    | 8000          | 36  | 2   | 2300            | 21.7          | 68                      | 11.4 | 179 | 159 |
|                    | 10000         | 29  | -2  | 2300            | 20.2          | 64                      | 10.7 | 176 | 152 |
|                    | 12000         | 21  | -6  | 2300            | 18.7          | 60                      | 10.0 | 173 | 145 |
|                    | 14000         | 14  | -10 | 2300            | 17.3          | 57                      | 9.5  | 170 | 137 |
|                    | 16000         | 7   | -14 | 2300            | 16.0          | 53                      | 8.9  | 165 | 129 |
| ISA +36°F (+20°C)  | SL            | 100 | 38  | 2300            | 24.0          | 68                      | 11.3 | 169 | 163 |
|                    | 2000          | 93  | 34  | 2300            | 24.0          | 69                      | 11.6 | 174 | 163 |
|                    | 4000          | 86  | 30  | 2300            | 24.0          | 71                      | 11.9 | 179 | 163 |
|                    | 6000          | 79  | 26  | 2300            | 23.4          | 71                      | 11.8 | 182 | 161 |
|                    | 8000          | 72  | 22  | 2300            | 21.7          | 66                      | 11.0 | 180 | 154 |
|                    | 10000         | 65  | 18  | 2300            | 20.2          | 62                      | 10.4 | 177 | 147 |
|                    | 12000         | 58  | 14  | 2300            | 18.7          | 58                      | 9.8  | 174 | 140 |
|                    | 14000         | 50  | 10  | 2300            | 17.3          | 55                      | 9.2  | 170 | 133 |
|                    | 16000         | 43  | 6   | 2300            | 16.0          | 52                      | 8.7  | 165 | 124 |

- NOTES: 1. FULL THROTTLE MANIFOLD PRESSURE SETTINGS ARE APPROXIMATE  
2. SHADED AREA REPRESENTS OPERATION WITH FULL THROTTLE

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

**Section V**  
**Performance**

**CRUISE POWER SETTINGS**  
**RECOMMENDED CRUISE POWER**  
**22.0 IN. HG. 2200 RPM (OR FULL THROTTLE)**  
**4900 LBS.**

|                    | PRESS<br>ALT. | OAT |     | ENGINE<br>SPEED | MAN.<br>PRESS | FUEL<br>FLOW/<br>ENGINE |      | TAS | CAS |
|--------------------|---------------|-----|-----|-----------------|---------------|-------------------------|------|-----|-----|
|                    | FEET          | °F  | °C  | RPM             | IN HG         | PPH                     | GPH  | KTS | KTS |
| ISA -36°F (-20°C)  | SL            | 27  | -3  | 2200            | 22.0          | 60                      | 10.1 | 152 | 158 |
|                    | 2000          | 20  | -7  | 2200            | 22.0          | 62                      | 10.4 | 157 | 158 |
|                    | 4000          | 13  | -10 | 2200            | 22.0          | 64                      | 10.7 | 162 | 159 |
|                    | 6000          | 7   | -14 | 2200            | 22.0          | 65                      | 10.9 | 167 | 159 |
|                    | 8000          | 0   | -18 | 2200            | 21.8          | 66                      | 11.0 | 171 | 158 |
|                    | 10000         | -8  | -22 | 2200            | 20.2          | 62                      | 10.4 | 169 | 151 |
|                    | 12000         | -15 | -26 | 2200            | 18.7          | 58                      | 9.8  | 166 | 144 |
|                    | 14000         | -22 | -30 | 2200            | 17.3          | 55                      | 9.2  | 161 | 136 |
|                    | 16000         | -30 | -34 | 2200            | 16.0          | 52                      | 8.7  | 157 | 128 |
| STANDARD DAY (ISA) | SL            | 63  | 17  | 2200            | 22.0          | 59                      | 9.8  | 154 | 154 |
|                    | 2000          | 56  | 14  | 2200            | 22.0          | 60                      | 10.1 | 159 | 155 |
|                    | 4000          | 49  | 10  | 2200            | 22.0          | 62                      | 10.4 | 165 | 155 |
|                    | 6000          | 43  | 6   | 2200            | 22.0          | 63                      | 10.6 | 169 | 155 |
|                    | 8000          | 36  | 2   | 2200            | 21.8          | 64                      | 10.7 | 173 | 154 |
|                    | 10000         | 28  | -2  | 2200            | 20.2          | 60                      | 10.1 | 171 | 147 |
|                    | 12000         | 21  | -6  | 2200            | 18.7          | 57                      | 9.5  | 168 | 140 |
|                    | 14000         | 14  | -10 | 2200            | 17.3          | 54                      | 9.0  | 164 | 132 |
|                    | 16000         | 6   | -14 | 2200            | 16.0          | 51                      | 8.5  | 159 | 125 |
| ISA +36°F (+20°C)  | SL            | 99  | 37  | 2200            | 22.0          | 57                      | 9.6  | 155 | 150 |
|                    | 2000          | 92  | 34  | 2200            | 22.0          | 59                      | 9.8  | 160 | 150 |
|                    | 4000          | 86  | 30  | 2200            | 22.0          | 60                      | 10.1 | 165 | 151 |
|                    | 6000          | 79  | 26  | 2200            | 22.0          | 62                      | 10.3 | 170 | 151 |
|                    | 8000          | 72  | 22  | 2200            | 21.8          | 62                      | 10.4 | 174 | 150 |
|                    | 10000         | 66  | 18  | 2200            | 20.2          | 59                      | 9.8  | 172 | 143 |
|                    | 12000         | 57  | 14  | 2200            | 18.7          | 55                      | 9.3  | 168 | 135 |
|                    | 14000         | 50  | 10  | 2200            | 17.3          | 52                      | 8.8  | 163 | 127 |
|                    | 16000         | 42  | 6   | 2200            | 16.0          | 50                      | 8.4  | 158 | 119 |

- NOTES: 1. FULL THROTTLE MANIFOLD PRESSURE  
 SETTINGS ARE APPROXIMATE  
 2. SHADED AREA REPRESENTS OPERATION  
 FULL THROTTLE

**Section V**  
**Performance**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

**CRUISE POWER SETTINGS**

**ECONOMY CRUISE POWER**

**20.0 IN. HG. 2100 RPM (OR FULL THROTTLE)**

**4900 LBS.**

|                    | PRESS<br>ALT. | OAT |     | ENGINE<br>SPEED | MAN.<br>PRESS | FUEL<br>FLOW/<br>ENGINE |     | TAS | CAS |
|--------------------|---------------|-----|-----|-----------------|---------------|-------------------------|-----|-----|-----|
|                    | FEET          | °F  | °C  | RPM             | IN HG         | PPH                     | GPH | KTS | KTS |
| ISA -36°F (-20°C)  | SL            | 26  | -3  | 2100            | 20.0          | 51                      | 8.5 | 138 | 143 |
|                    | 2000          | 19  | -7  | 2100            | 20.0          | 52                      | 8.7 | 143 | 144 |
|                    | 4000          | 13  | -11 | 2100            | 20.0          | 53                      | 8.9 | 148 | 144 |
|                    | 6000          | 6   | -15 | 2100            | 20.0          | 55                      | 9.1 | 152 | 145 |
|                    | 8000          | -1  | -18 | 2100            | 20.0          | 56                      | 9.3 | 157 | 145 |
|                    | 10000         | -8  | -22 | 2100            | 20.0          | 57                      | 9.5 | 161 | 144 |
|                    | 12000         | -15 | -26 | 2100            | 18.7          | 55                      | 9.1 | 160 | 139 |
|                    | 14000         | -23 | -30 | 2100            | 17.3          | 52                      | 8.7 | 156 | 132 |
|                    | 16000         | -30 | -34 | 2100            | 16.0          | 50                      | 8.3 | 152 | 124 |
| STANDARD DAY (ISA) | SL            | 62  | 17  | 2100            | 20.0          | 50                      | 8.4 | 139 | 139 |
|                    | 2000          | 55  | 13  | 2100            | 20.0          | 51                      | 8.5 | 144 | 139 |
|                    | 4000          | 49  | 9   | 2100            | 20.0          | 52                      | 8.7 | 148 | 140 |
|                    | 6000          | 42  | 5   | 2100            | 20.0          | 53                      | 8.9 | 153 | 140 |
|                    | 8000          | 35  | 2   | 2100            | 20.0          | 54                      | 9.1 | 157 | 140 |
|                    | 10000         | 28  | -2  | 2100            | 20.0          | 55                      | 9.2 | 162 | 139 |
|                    | 12000         | 21  | -6  | 2100            | 18.7          | 53                      | 8.9 | 161 | 134 |
|                    | 14000         | 13  | -10 | 2100            | 17.3          | 51                      | 8.5 | 156 | 126 |
|                    | 16000         | 6   | -14 | 2100            | 16.0          | 49                      | 8.1 | 151 | 118 |
| ISA +36°F (+20°C)  | SL            | 98  | 37  | 2100            | 20.0          | 49                      | 8.2 | 139 | 134 |
|                    | 2000          | 92  | 33  | 2100            | 20.0          | 50                      | 8.4 | 144 | 135 |
|                    | 4000          | 85  | 29  | 2100            | 20.0          | 51                      | 8.5 | 148 | 135 |
|                    | 6000          | 78  | 25  | 2100            | 20.0          | 52                      | 8.7 | 153 | 135 |
|                    | 8000          | 71  | 22  | 2100            | 20.0          | 53                      | 8.9 | 158 | 135 |
|                    | 10000         | 64  | 18  | 2100            | 20.0          | 54                      | 9.0 | 162 | 135 |
|                    | 12000         | 57  | 14  | 2100            | 18.7          | 52                      | 8.7 | 160 | 129 |
|                    | 14000         | 49  | 10  | 2100            | 17.3          | 50                      | 8.3 | 155 | 121 |
|                    | 16000         | 42  | 6   | 2100            | 16.0          | 48                      | 8.0 | 148 | 112 |

- NOTES: 1. FULL THROTTLE MANIFOLD PRESSURE  
SETTINGS ARE APPROXIMATE  
2. SHADED AREA REPRESENTS OPERATION  
WITH FULL THROTTLE

# RANGE PROFILE - 100 GALLONS

## ASSOCIATED CONDITIONS:

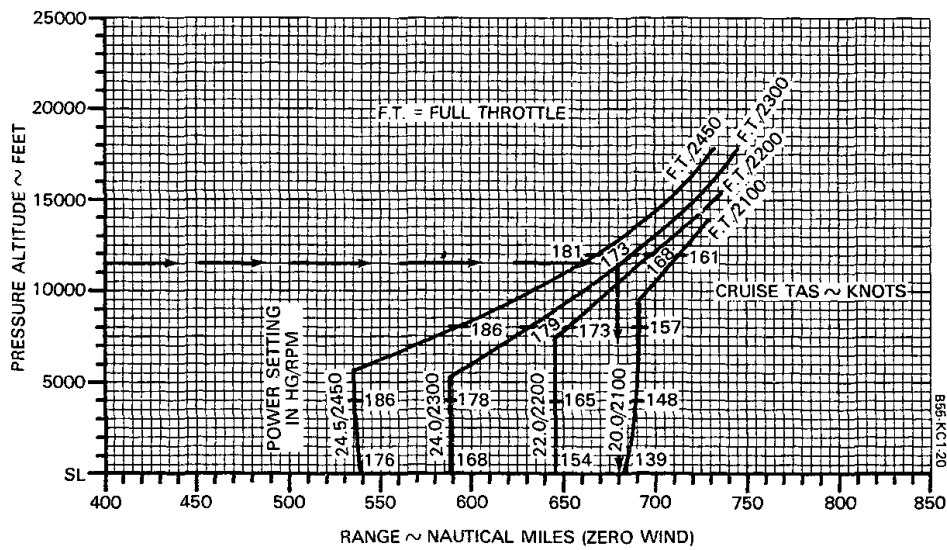
WEIGHT 5121 LBS BEFORE ENGINE START  
 FUEL AVIATION GASOLINE  
 FUEL DENSITY 6.0 LBS/GAL  
 INITIAL FUEL LOADING 100 U.S. GAL (600 LBS)

STANDARD DAY (ISA)

NOTE:  
 RANGE INCLUDES START, TAXI, CLIMB AND DESCENT  
 WITH 45 MINUTES RESERVE FUEL AT ECONOMY CRUISE

## EXAMPLE:

PRESSURE ALTITUDE 11500 FT  
 POWER SETTING FULL THROTTLE  
 2300 RPM  
 RANGE 680 N M



BEECHCRAFT Baron B55  
 Serial TC 2003 and After

Section V  
 Performance

# ENDURANCE PROFILE - 100 GALLONS

## ASSOCIATED CONDITIONS:

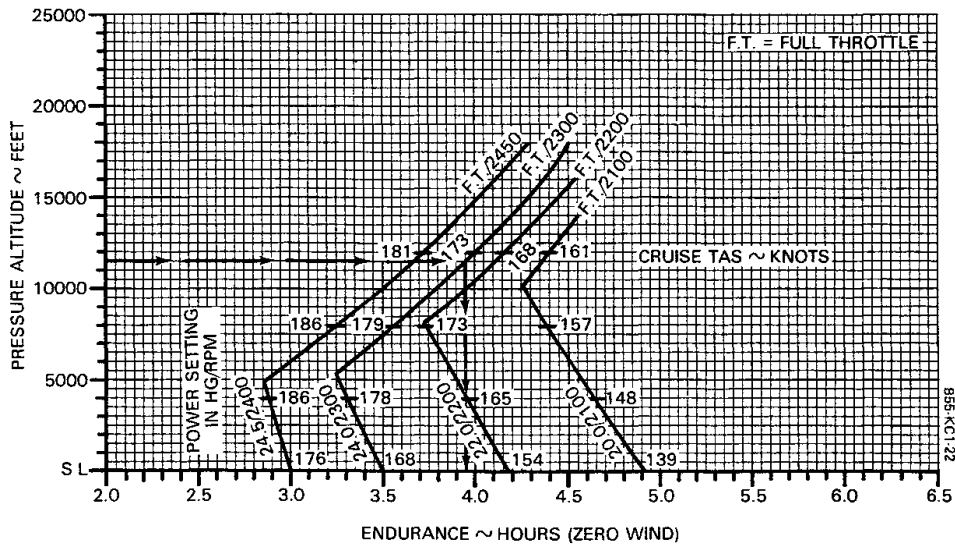
WEIGHT 5121 LBS BEFORE ENGINE START  
 FUEL AVIATION GASOLINE  
 FUEL DENSITY 6.0 LBS/GAL  
 INITIAL LOADING 100 U.S. GAL (600 LBS)

STANDARD DAY (ISA)

NOTE:  
 ENDURANCE INCLUDES START, TAXI, CLIMB AND DESCENT  
 WITH 45 MINUTES RESERVE FUEL AT ECONOMY CRUISE

## EXAMPLE:

|                   |                           |
|-------------------|---------------------------|
| PRESSURE ALTITUDE | 11500 FT                  |
| POWER SETTING     | FULL THROTTLE<br>2300 RPM |
| ENDURANCE         | 3.95 HRS<br>3 HRS 58 MIN  |



Section V  
 Performance

BEECHCRAFT Baron B55  
 Serial TC 2003 and After



# ENDURANCE PROFILE - 136 GALLONS

## ASSOCIATED CONDITIONS:

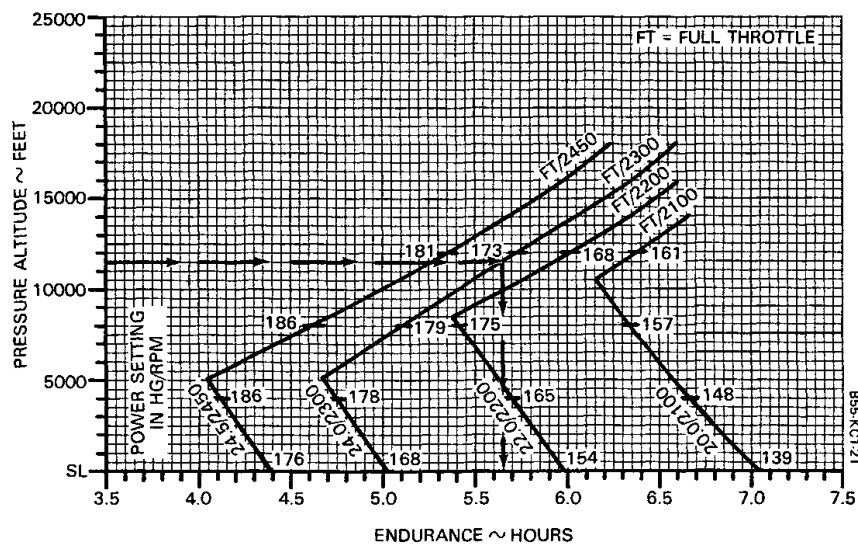
WEIGHT 5121 LBS BEFORE ENGINE START  
 FUEL AVIATION GASOLINE  
 FUEL DENSITY 6.0 LBS/GAL  
 INITIAL LOADING 136 U.S. GAL (816 LBS)

STANDARD DAY (ISA)

NOTE:  
 ENDURANCE INCLUDES START, TAXI, CLIMB AND DESCENT  
 WITH 45 MINUTES RESERVE FUEL AT ECONOMY CRUISE

## EXAMPLE:

PRESSURE ALTITUDE 11500 FEET  
 POWER SETTING FULL THROTTLE  
 2300 MPH  
 ENDURANCE 5.65 HRS  
 5 HRS 39 MIN





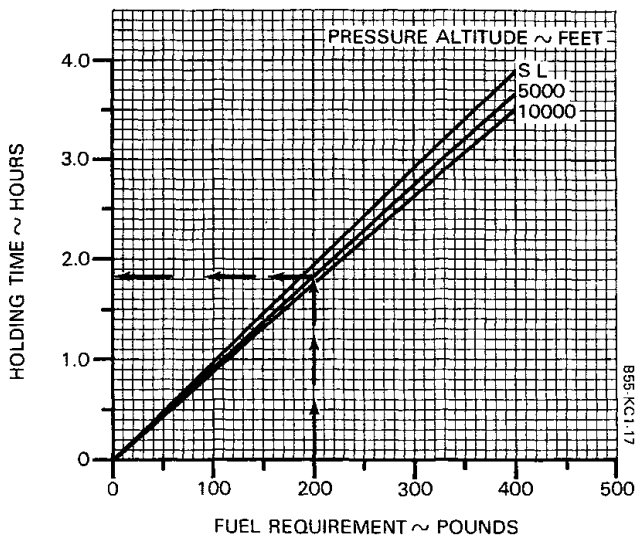
# **HOLDING TIME**

ASSOCIATED CONDITIONS:

POWER SETTING    20.0 IN. HG OR  
 FULL THROTTLE  
 2100 RPM

EXAMPLE

|                               |                         |
|-------------------------------|-------------------------|
| FUEL AVAILABLE<br>FOR HOLDING | 200 LBS                 |
| PRESSURE ALT                  | 5000 FT                 |
| HOLDING TIME                  | 1.8 HRS<br>1 HR. 48 MIN |



# Section V Performance

# BEECHCRAFT Baron B55 Serial TC 2003 and After

## TIME, FUEL AND DISTANCE TO DESCEND

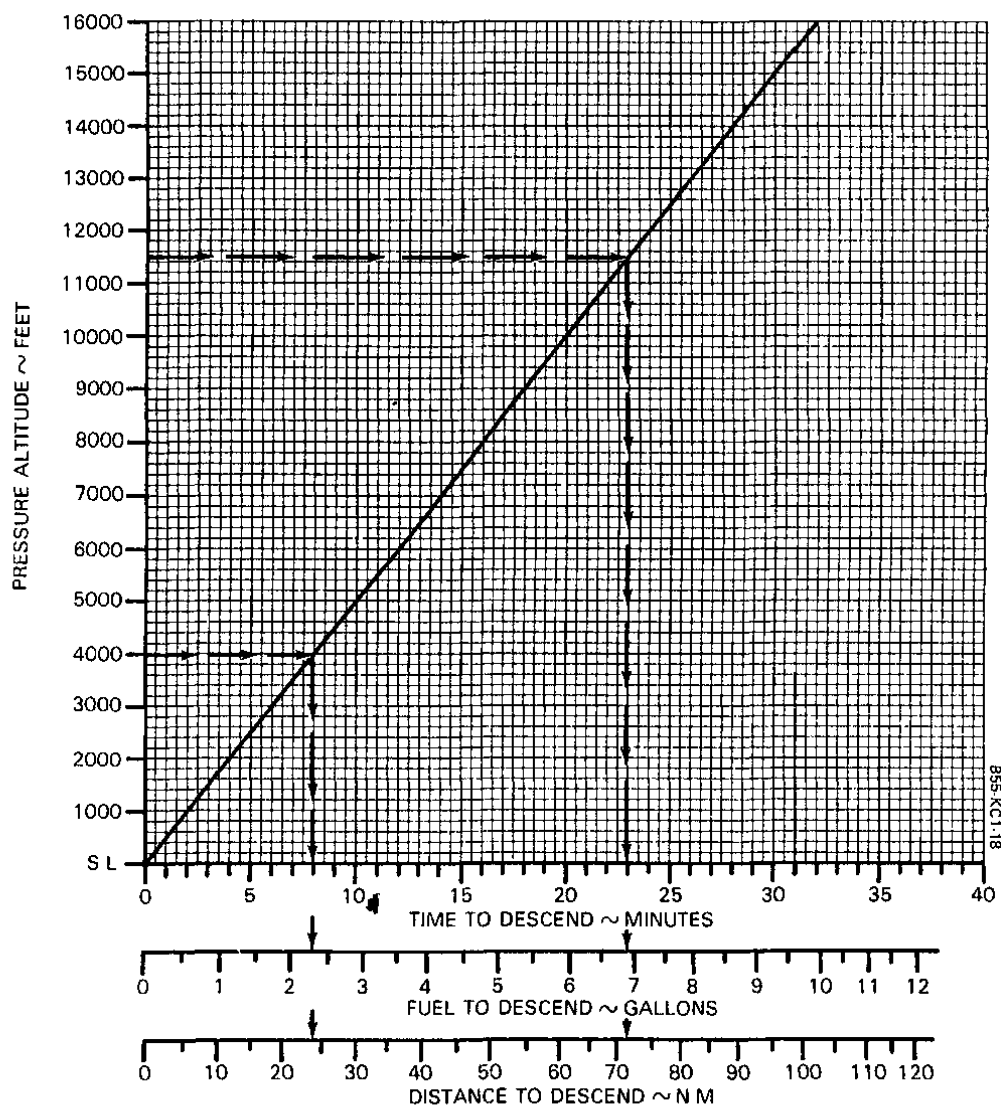
DESCENT SPEED  
172 KIAS

### ASSOCIATED CONDITIONS:

POWER AS REQUIRED TO  
MAINTAIN 500 FT/MIN  
RATE-OF-DESCENT  
LANDING GEAR UP  
FLAPS UP

### EXAMPLE:

|                     |                       |
|---------------------|-----------------------|
| INITIAL ALTITUDE    | 11500 FT              |
| FINAL ALTITUDE      | 3965 FT               |
| TIME TO DESCEND     | $23 - 8 = 15$ MIN     |
| FUEL TO DESCEND     | $6.9 - 2.2 = 4.7$ GAL |
| DISTANCE TO DESCEND | $72 - 24 = 48$ NM     |



CLIMB-BALKED LANDING

ASSOCIATED CONDITIONS:

POWER  
FLAPS  
LANDING GEAR  
MIXTURE

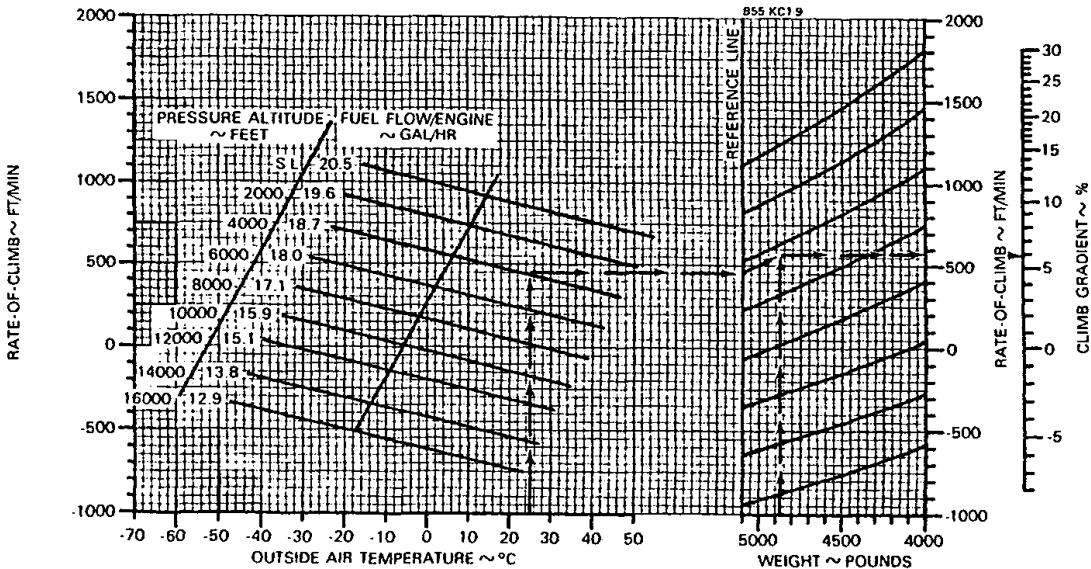
TAKE-OFF  
DOWN  
DOWN  
LEAN TO APPROPRIATE  
FUEL FLOW

CLIMB SPEED 90 KNOTS (ALL WEIGHTS)

EXAMPLE

OAT 25°C (77°F)  
PRESSURE ALTITUDE 3965 FT  
WEIGHT 4873 LBS

RATE-OF-CLIMB 570 FT/MIN  
CLIMB GRADIENT 6%



ASSOCIATED CONDITIONS

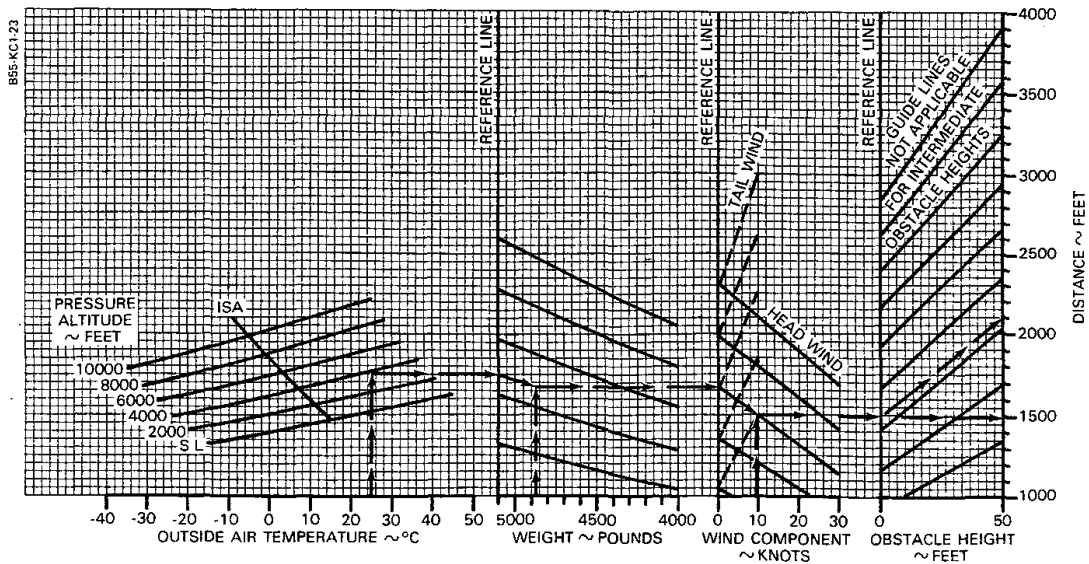
POWER RETARDED TO MAINTAIN  
800 FT/MIN ON FINAL  
APPROACH  
FLAPS DOWN  
LANDING GEAR DOWN  
RUNWAY PAVED, LEVEL, DRY  
SURFACE  
APPROACH SPEED IAS AS TABULATED  
BRAKING MAXIMUM

LANDING DISTANCE

| WEIGHT<br>~<br>LBS | SPEED AT 50 FEET |
|--------------------|------------------|
|                    | KNOTS            |
| 5100               | 90               |
| 4800               | 87               |
| 4600               | 85               |
| 4400               | 84               |
| 4200               | 81               |

EXAMPLE:

OAT 25°C  
PRESSURE ALTITUDE 3965 FT  
WEIGHT 4873 LBS  
WIND COMPONENT 9.5 KTS  
GROUND ROLL 1500 FT  
TOTAL OVER 50 FT 2100 FT  
OBSTACLE APPROACH 87 KTS



Section V  
Performance

BEECHCRAFT Baron B55  
Serial TC 2003 and After

# **SECTION VI**

## **WEIGHT AND BALANCE/ EQUIPMENT LIST**

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| Airplane Papers (furnished with individual airplane) |             |

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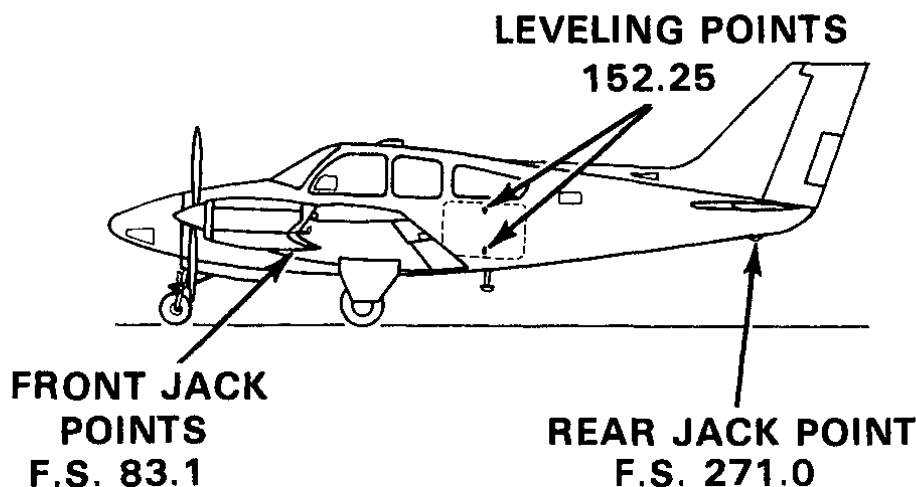
## **WEIGHING INSTRUCTIONS**

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. Three jack points are provided for weighing: two on the wing front spar at Fuselage Station 83.1 and one on the aft fuselage at Fuselage Station 271.0.
2. Fuel should be drained preparatory to weighing. Tanks are drained from the regular drain ports with the airplane in static ground attitude. When tanks are drained, 5.7 pounds of undrainable fuel remain in the airplane at Fuselage Station 81.6. The remainder of the unusable fuel to be added to a drained system is 30.3 pounds at Fuselage Station 78.5
3. Engine oil must be at the full level or completely drained. Total engine oil when full is 45 pounds at Fuselage Station 43.
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. The airplane must be in a longitudinally level attitude at the time of weighing. Leveling screws are located on the left side of the fuselage at Fuselage Station 152.25 (approximately). Level attitude is determined with a plumb bob.
6. Measurement of the reaction arms for a wheel weighing is made using a steel measuring tape. Measurements are taken, with the airplane level on the scales, from the reference (a plumb bob dropped

from the center of either main jack point) to the axle center line of the main gear and then to the nose wheel axle center line. The main wheel axle center line is best located by stretching a string across from one main wheel to the other. All measurements are to be taken with the tape level with the hangar floor and parallel to the fuselage center line. The locations of the wheel reactions will be approximately at Fuselage Station 96.7 for main wheels and Fuselage Station 12.7 for the nose wheel.

7. Jack point weighings are accomplished by placing scales at the jack points specified in step 1 above. Since the center of gravity of the airplane is forward of Fuselage Station 83.1, the tail reaction of the airplane will be in an up direction. This can be measured on regular scales by placing ballast of approximately 200 pounds on the scales and attached to the aft weighing point 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

BARON B55 SER. NO. \_\_\_\_\_ REG. NO. \_\_\_\_\_ DATE \_\_\_\_\_  
**STRUT POSITION - NOSE MAIN JACK POINT LOCATION PREPARED BY**  
 EXTENDED +11.8 96 FORWARD 83.1 Company \_\_\_\_\_  
 COMPRESSED +13.1 97 AFT 271.0 Signature \_\_\_\_\_

| REACTION<br>WHEEL - JACK POINTS                                             | SCALE<br>READING | TARE | NET<br>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                                                                  |                  |      | 45            | -   | 1935   |
| UNUSABLE FUEL                                                               |                  |      | 36            | 79  | 2844   |
| BASIC EMPTY WEIGHT                                                          |                  |      |               |     |        |

BEECHCRAFT Baron B55  
Serial TC 2003 and After

Section VI  
Wt and Bal/Equip List

**NOTE**

Each new airplane is delivered with a completed sample loading, 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 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 reweighed to establish the empty weight and c.g. and that an inventory of installed equipment be conducted to create a new equipment list.

WEIGHT AND BALANCE RECORD

SERIAL NO. \_\_\_\_\_ REGISTRATION NO. \_\_\_\_\_ PAGE NO. \_\_\_\_\_

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

BEECHCRAFT Baron B55  
Serial TC 2003 and After

Section VI  
Wt and Bal/Equip List

# WEIGHT AND BALANCE RECORD

SERIAL NO. \_\_\_\_\_ REGISTRATION NO. \_\_\_\_\_ PAGE NO. \_\_\_\_\_

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

Section VI  
Wt and Bal/Equip List

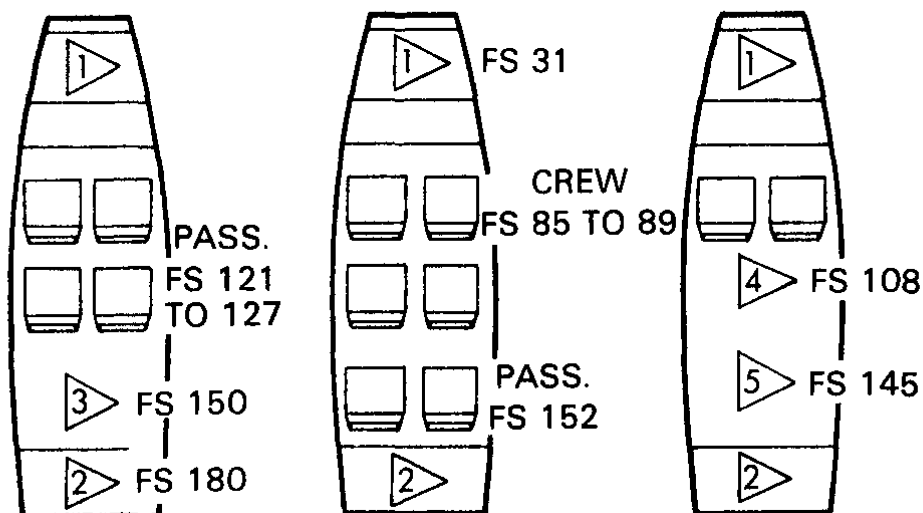
BEECHCRAFT Baron B55  
Serial TC 2003 and After

## **LOADING INSTRUCTIONS**

It is the responsibility of the airplane operator to ensure that the airplane is properly loaded. At the time of delivery, Beech Aircraft Corporation provides the necessary weight and balance data to compute individual loadings. All subsequent changes in airplane weight and balance are the responsibility of the airplane owner and/or operator.

The empty weight and moment of the airplane at the time of delivery are shown on the airplane Empty Weight and Balance form. Useful load items which may be loaded into the airplane are shown on the Useful Load Weight and Moment tables. The minimum and maximum moments are indicated on the Moment Limits vs Weight table. These moments correspond to the forward and aft center of gravity flight limits for a particular weight. All moments are divided by 100 to simplify computations.

### SEATING, BAGGAGE AND EQUIPMENT ARRANGEMENTS



#### NOTE

The floor structure load limit is 100 pounds per square foot, except for the area between the front and rear spars, where the floor structure load limit is 50 pounds per square foot.

- 1 MAXIMUM WEIGHT 300 POUNDS INCLUDING EQUIPMENT AND BAGGAGE.
- 2 MAXIMUM WEIGHT 120 POUNDS INCLUDING EQUIPMENT AND BAGGAGE.
- 3 MAXIMUM WEIGHT 400 POUNDS INCLUDING EQUIPMENT AND BAGGAGE WITH 5th and 6th SEATS REMOVED OR STOWED.
- 4 MAXIMUM WEIGHT 200 POUNDS FORWARD OF REAR SPAR INCLUDING EQUIPMENT AND CARGO WITH 3rd and 4th SEATS REMOVED. ALL CARGO MUST BE SECURED WITH APPROVED CARGO RETENTION NETS.
- 5 MAXIMUM WEIGHT 400 POUNDS AFT OF REAR SPAR INCLUDING EQUIPMENT AND CARGO WITH 3rd, 4th, 5th and 6th SEATS REMOVED.

**MOMENT LIMITS vs WEIGHT**

Moment limits are based on the following weight and center of gravity limit data (landing gear down).

| <b>WEIGHT<br/>CONDITION</b>                    | <b>FORWARD<br/>CG LIMIT</b> | <b>AFT CG LIMIT</b> |
|------------------------------------------------|-----------------------------|---------------------|
| 5100 lb. (B55<br>max.take-off<br>or landing)   | 81.0                        | 86.0                |
| 4990 lb. (B55A<br>max. take-off<br>or landing) | 79.9                        | 86.0                |
| 4740 lb.                                       | 77.5                        | 86.0                |
| 3800 lb. or less                               | 74.0                        | 86.0                |

| <b>Weight</b> | <b>Minimum<br/>Moment<br/>100</b> | <b>Maximum<br/>Moment<br/>100</b> |
|---------------|-----------------------------------|-----------------------------------|
| 3200          | 2368                              | 2752                              |
| 3225          | 2387                              | 2774                              |
| 3250          | 2405                              | 2795                              |
| 3275          | 2424                              | 2817                              |
| 3300          | 2442                              | 2838                              |
| 3325          | 2461                              | 2860                              |
| 3350          | 2479                              | 2881                              |
| 3375          | 2498                              | 2903                              |
| 3400          | 2516                              | 2924                              |
| 3425          | 2535                              | 2946                              |
| 3450          | 2553                              | 2967                              |
| 3475          | 2572                              | 2989                              |
| 3500          | 2590                              | 3010                              |
| 3525          | 2609                              | 3032                              |
| 3550          | 2627                              | 3053                              |
| 3575          | 2646                              | 3075                              |

**MOMENT LIMITS vs WEIGHT (Continued)**

| <b>Weight</b> | <b><u>Minimum</u><br/><u>Moment</u><br/><b>100</b></b> | <b><u>Maximum</u><br/><u>Moment</u><br/><b>100</b></b> |
|---------------|--------------------------------------------------------|--------------------------------------------------------|
| 3600          | 2664                                                   | 3096                                                   |
| 3625          | 2683                                                   | 3118                                                   |
| 3650          | 2701                                                   | 3139                                                   |
| 3675          | 2720                                                   | 3161                                                   |
| 3700          | 2738                                                   | 3182                                                   |
| 3725          | 2757                                                   | 3204                                                   |
| 3750          | 2775                                                   | 3225                                                   |
| 3775          | 2794                                                   | 3247                                                   |
| 3800          | 2812                                                   | 3268                                                   |
| 3825          | 2834                                                   | 3290                                                   |
| 3850          | 2856                                                   | 3311                                                   |
| 3875          | 2878                                                   | 3333                                                   |
| 3900          | 2901                                                   | 3354                                                   |
| 3925          | 2923                                                   | 3376                                                   |
| 3950          | 2945                                                   | 3397                                                   |
| 3975          | 2967                                                   | 3419                                                   |
| 4000          | 2990                                                   | 3440                                                   |
| 4025          | 3012                                                   | 3462                                                   |
| 4050          | 3035                                                   | 3483                                                   |
| 4075          | 3057                                                   | 3505                                                   |
| 4100          | 3080                                                   | 3526                                                   |
| 4125          | 3102                                                   | 3548                                                   |
| 4150          | 3125                                                   | 3569                                                   |
| 4175          | 3148                                                   | 3591                                                   |
| 4200          | 3170                                                   | 3612                                                   |
| 4225          | 3193                                                   | 3634                                                   |
| 4250          | 3216                                                   | 3655                                                   |
| 4275          | 3239                                                   | 3677                                                   |
| 4300          | 3262                                                   | 3698                                                   |
| 4325          | 3285                                                   | 3720                                                   |



**MOMENT LIMITS vs WEIGHT (Continued)**

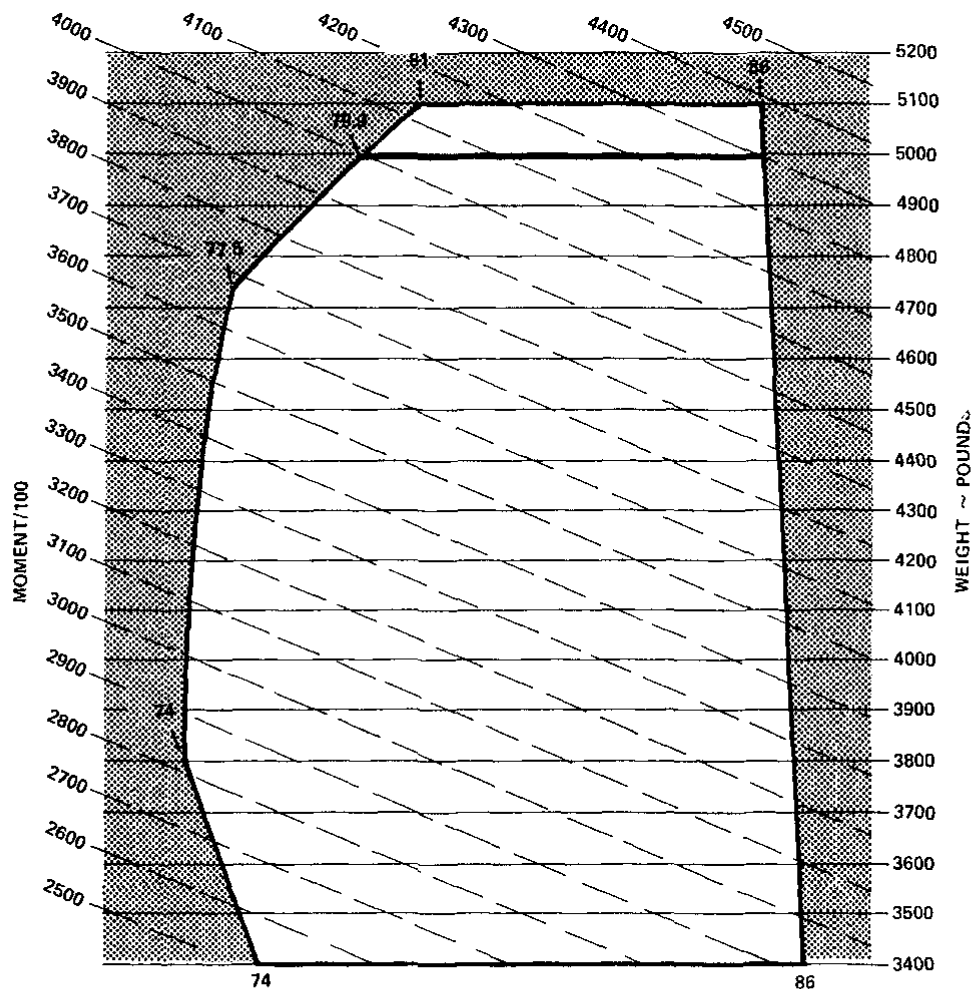
| <b>Weight</b> | <b><u>Minimum<br/>Moment</u><br/>100</b> | <b><u>Maximum<br/>Moment</u><br/>100</b> |
|---------------|------------------------------------------|------------------------------------------|
| 4350          | 3308                                     | 3741                                     |
| 4375          | 3331                                     | 3763                                     |
| 4400          | 3354                                     | 3784                                     |
| 4425          | 3377                                     | 3806                                     |
| 4450          | 3401                                     | 3827                                     |
| 4475          | 3424                                     | 3849                                     |
| 4500          | 3447                                     | 3870                                     |
| 4525          | 3471                                     | 3892                                     |
| 4550          | 3494                                     | 3913                                     |
| 4575          | 3517                                     | 3935                                     |
| 4600          | 3541                                     | 3956                                     |
| 4625          | 3564                                     | 3978                                     |
| 4650          | 3588                                     | 3999                                     |
| 4675          | 3612                                     | 4021                                     |
| 4700          | 3635                                     | 4042                                     |
| 4725          | 3659                                     | 4064                                     |
| 4750          | 3686                                     | 4085                                     |
| 4775          | 3717                                     | 4107                                     |
| 4800          | 3748                                     | 4128                                     |
| 4825          | 3779                                     | 4150                                     |
| 4850          | 3810                                     | 4171                                     |
| 4875          | 3842                                     | 4193                                     |
| 4900          | 3873                                     | 4214                                     |
| 4925          | 3905                                     | 4236                                     |
| 4950          | 3937                                     | 4257                                     |
| 4975          | 3969                                     | 4279                                     |
| 4990          | 3988                                     | 4291                                     |
| 5000          | 4001                                     | 4300                                     |
| 5025          | 4033                                     | 4322                                     |
| 5050          | 4066                                     | 4343                                     |
| 5075          | 4098                                     | 4365                                     |
| 5100          | 4131                                     | 4386                                     |

**Section VI**  
**Wt and Bal/Equip List**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

**Baron B55 and B55A**

**MOMENT LIMITS vs WEIGHT**



CENTER OF GRAVITY ~ INCHES AFT OF DATUM

ENVELOPE BASED ON THE FOLLOWING WEIGHT AND  
 CENTER OF GRAVITY LIMIT DATA (LANDING GEAR DOWN)

**B 5 5**

| <u>WEIGHT CONDITION</u>              | <u>FORWARD CG. LIMIT</u> | <u>AFT CG. LIMIT</u> |
|--------------------------------------|--------------------------|----------------------|
| 5100 LB (MAX TAKE-OFF<br>OR LANDING) | 81.0                     | 86.0                 |
| 4740 LB                              | 77.5                     | 86.0                 |
| 3800 LB or LESS                      | 74.0                     | 86.0                 |

**B 5 5 A**

| <u>WEIGHT CONDITION</u>              | <u>FORWARD CG. LIMIT</u> | <u>AFT CG. LIMIT</u> |
|--------------------------------------|--------------------------|----------------------|
| 4990 LB (MAX TAKE-OFF<br>OR LANDING) | 79.9                     | 86.0                 |
| 4740 LB                              | 77.5                     | 86.0                 |
| 3800 LB or LESS                      | 74.0                     | 86.0                 |

B55-601-80

## **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 and taxi 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 table 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.

**Section VI**  
**Wt and Bal/Equip List**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

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**

**BARON**   B55   **DATE** \_\_\_\_\_

**SERIAL NO.**   TC-XXXX   **REG NO.**   NXXX  

| ITEM                                         | WEIGHT | MOM/100 |
|----------------------------------------------|--------|---------|
| 1. BASIC EMPTY CONDITION                     | 3337   | 2634    |
| 2. FRONT SEAT OCCUPANTS                      | 340    | 290     |
| 3. 3rd and 4th SEAT OCCUPANTS                | 340    | 412     |
| 4. 5th and 6th SEAT OCCUPANTS                | 170    | 258     |
| 5. NOSE BAGGAGE                              | 78     | 24      |
| 6. REAR BAGGAGE                              | -      | -       |
| 7. AFT BAGGAGE                               | 40     | 72      |
| 8. CARGO                                     | -      | -       |
| 9. SUB TOTAL ZERO FUEL CONDITION             | 4305   | 3690    |
| 10. FUEL LOADING (136 GAL)                   | 816    | 671     |
| 11. SUB TOTAL RAMP CONDITION                 | 5121   | 4361    |
| 12. *LESS FUEL FOR START, TAXI, AND TAKE-OFF | -21    | -17     |
| 13. SUB TOTAL TAKE-OFF CONDITION             | 5100   | 4344    |
| 14. LESS FUEL TO DESTINATION (112 GAL)       | -675   | -562    |
| 15. LANDING CONDITION                        | 4425   | 3782    |

\*Fuel for start, taxi and take-off is normally 21 lbs at an average mom/100 of 17.

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

**Section VI**  
**Wt and Bal/Equip List**

**WEIGHT AND BALANCE LOADING FORM**

**BARON** \_\_\_\_\_ **DATE** \_\_\_\_\_

**SERIAL NO.** \_\_\_\_\_ **REG NO.** \_\_\_\_\_

| <b>ITEM</b>                                     | <b>WEIGHT</b> | <b>MOM/100</b> |
|-------------------------------------------------|---------------|----------------|
| 1. BASIC EMPTY CONDITION                        |               |                |
| 2. FRONT SEAT OCCUPANTS                         |               |                |
| 3. 3rd and 4th SEAT<br>OCCUPANTS                |               |                |
| 4. 5th and 6th SEAT<br>OCCUPANTS                |               |                |
| 5. NOSE BAGGAGE                                 |               |                |
| 6. REAR BAGGAGE                                 |               |                |
| 7. AFT BAGGAGE                                  |               |                |
| 8. CARGO                                        |               |                |
| 9. SUB TOTAL ZERO FUEL<br>CONDITION             |               |                |
| 10. FUEL LOADING                                |               |                |
| 11. SUB TOTAL<br>RAMP CONDITION                 |               |                |
| 12. *LESS FUEL FOR START,<br>TAXI, AND TAKE-OFF |               |                |
| 13. SUB TOTAL<br>TAKE-OFF CONDITION             |               |                |
| 14. LESS FUEL TO<br>DESTINATION                 |               |                |
| 15. LANDING CONDITION                           |               |                |

\*Fuel for start, taxi and take-off is normally 21 lbs at an average mom/100 of 17.

## USEFUL LOAD WEIGHTS AND MOMENTS

## OCCUPANTS

|                                                                                                                                                          | Front Seats  |              | 3rd and 4th Seats |              | 5th and 6th Seats |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|--------------|-------------------|--------------|-------------------|
|                                                                                                                                                          | Fwd Position | Aft Position | Fwd Position      | Aft Position |                   |
| WEIGHT                                                                                                                                                   | ARM 85       | ARM 89       | ARM 121           | ARM 127      | ARM 152           |
| 120                                                                                                                                                      | 102          | 107          | 145               | 152          | 182               |
| 130                                                                                                                                                      | 110          | 116          | 157               | 165          | 198               |
| 140                                                                                                                                                      | 119          | 125          | 169               | 178          | 213               |
| 150                                                                                                                                                      | 128          | 134          | 182               | 190          | 228               |
| 160                                                                                                                                                      | 136          | 142          | 194               | 203          | 243               |
| 170                                                                                                                                                      | 144          | 151          | 206               | 216          | 258               |
| 180                                                                                                                                                      | 153          | 160          | 218               | 229          | 274               |
| 190                                                                                                                                                      | 162          | 169          | 230               | 241          | 289               |
| 200                                                                                                                                                      | 170          | 178          | 242               | 254          | 304               |
| NOTE: OCCUPANT POSITIONS SHOWN ARE FOR THE SEATS ADJUSTED THE MAXIMUM RANGE. INTERMEDIATE POSITIONS WILL REQUIRE INTERPOLATION OF THE MOMENT/100 VALUES. |              |              |                   |              |                   |

**BAGGAGE**

| Weight | NOSE    | REAR          | AFT           |
|--------|---------|---------------|---------------|
|        | COMPT   | FS 131 TO 170 | FS 170 TO 190 |
|        | ARM 31  | ARM 150       | ARM 180       |
|        | Mom/100 | Mom/100       | Mom/100       |
| 10     | 3       | 15            | 18            |
| 20     | 6       | 30            | 36            |
| 30     | 9       | 45            | 54            |
| 40     | 12      | 60            | 72            |
| 50     | 16      | 75            | 90            |
| 60     | 19      | 90            | 108           |
| 70     | 22      | 105           | 126           |
| 80     | 25      | 120           | 144           |
| 90     | 28      | 135           | 162           |
| 100    | 31      | 150           | 180           |
| 110    | 34      | 165           | 198           |
| 120    | 37      | 180           | 216           |
| 130    | 40      | 195           |               |
| 140    | 43      | 210           |               |
| 150    | 47      | 225           |               |
| 160    | 50      | 240           |               |
| 170    | 53      | 255           |               |
| 180    | 56      | 270           |               |
| 190    | 59      | 285           |               |
| 200    | 62      | 300           |               |
| 220    | 68      | 330           |               |
| 240    | 74      | 360           |               |
| 260    | 81      | 390           |               |
| 280    | 87      | 420           |               |
| 300    | 93      | 450           |               |
| 320    |         | 480           |               |
| 340    |         | 510           |               |
| 360    |         | 540           |               |
| 380    |         | 570           |               |
| 400    |         | 600           |               |

**CARGO**  
**FWD OF SPAR**  
**(CENTER SEATS REMOVED)**  
**ARM 108**

| <b>Weight</b> | <b><u>Moment</u><br/>100</b> | <b>Weight</b> | <b><u>Moment</u><br/>100</b> |
|---------------|------------------------------|---------------|------------------------------|
| 10            | 11                           | 110           | 119                          |
| 20            | 22                           | 120           | 130                          |
| 30            | 32                           | 130           | 140                          |
| 40            | 43                           | 140           | 151                          |
| 50            | 54                           | 150           | 162                          |
| 60            | 65                           | 160           | 173                          |
| 70            | 76                           | 170           | 184                          |
| 80            | 86                           | 180           | 194                          |
| 90            | 97                           | 190           | 205                          |
| 100           | 108                          | 200           | 216                          |

**CARGO**  
**AFT OF SPAR**  
**(CENTER & AFT SEATS REMOVED)**  
**ARM 145**

| <b>Weight</b> | <b><u>Moment</u><br/>100</b> | <b>Weight</b> | <b><u>Moment</u><br/>100</b> |
|---------------|------------------------------|---------------|------------------------------|
| 10            | 15                           | 110           | 160                          |
| 20            | 29                           | 120           | 174                          |
| 30            | 44                           | 130           | 189                          |
| 40            | 58                           | 140           | 203                          |
| 50            | 73                           | 150           | 218                          |
| 60            | 87                           | 160           | 232                          |
| 70            | 102                          | 170           | 247                          |
| 80            | 116                          | 180           | 261                          |
| 90            | 131                          | 190           | 276                          |
| 100           | 145                          | 200           | 290                          |



**CARGO**  
**AFT OF SPAR**  
**(CENTER & AFT SEATS REMOVED)**  
**ARM 145 (Continued)**

| <b>Weight</b> | <b><u>Moment</u><br/>100</b> | <b>Weight</b> | <b><u>Moment</u><br/>100</b> |
|---------------|------------------------------|---------------|------------------------------|
| 210           | 305                          | 310           | 450                          |
| 220           | 319                          | 320           | 464                          |
| 230           | 334                          | 330           | 479                          |
| 240           | 348                          | 340           | 493                          |
| 250           | 363                          | 350           | 508                          |
| 260           | 377                          | 360           | 522                          |
| 270           | 392                          | 370           | 537                          |
| 280           | 406                          | 380           | 551                          |
| 290           | 421                          | 390           | 566                          |
| 300           | 435                          | 400           | 580                          |

**USABLE FUEL**

| <b>Gallons</b> | <b>Weight</b> | <b>100<br/>GAL</b> | <b>136<br/>GAL</b> |
|----------------|---------------|--------------------|--------------------|
|                |               | <b>Mom/100</b>     |                    |
| 10             | 60            | 45                 | 46                 |
| 20             | 120           | 90                 | 92                 |
| 30             | 180           | 135                | 140                |
| 40             | 240           | 180                | 189                |
| 50             | 300           | 225                | 238                |
| 60             | 360           | 270                | 288                |
| 70             | 420           | 315                | 338                |
| 80             | 480           | 360                | 388                |
| 90             | 540           | 406                | 439                |
| 100            | 600           | 452                | 489                |
| 110            | 660           |                    | 539                |
| 120            | 720           |                    | 590                |
| 130            | 780           |                    | 641                |
| 136            | 816           |                    | 671                |

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# **SECTION VII**

## **SYSTEMS DESCRIPTION**

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## **AIRFRAME**

The BEECHCRAFT BARON B-55 is a four to six place all-metal, low-wing, twin-engine airplane with retractable tri-cycle landing gear, and a conventional horizontal and vertical stabilizer.

## **FLIGHT CONTROLS**

### **CONTROL SURFACES**

Control surfaces are bearing supported and operated through push-pull rods and conventional cable systems terminating in bellcranks.

### **CONTROL COLUMN**

The throw-over type control column for elevator and aileron control can be placed in front of either front seat. Pull the T-handle latch at the back of the control arm and position the control wheel as desired. Check for full freedom of movement after repositioning the control.

### **NOTE**

If a reduced power throttle position exists when throwing over the control column, it will be necessary to momentarily move the throttle levers forward for passage of the control column.

The optional dual control column is required for flight instruction.

## **RUDDER PEDALS**

To adjust the rudder pedals, press the spring-loaded lever on the side of each pedal arm and move the pedal to its forward or aft position. The adjustment lever can also be used to place the right set of rudder pedals against the floor, (when the copilot brakes are not installed) when not in use.

## **TRIM CONTROLS**

All trim tabs are adjustable from the control console. A position indicator is provided for each. The left aileron tab incorporates servo action in addition to its trimming purpose. Elevator trim is controlled by a hand wheel located to the left of the throttles. An elevator tab indicator dial is located above and to the left of the trim control hand wheel.

## **INSTRUMENT PANEL**

### **FLIGHT INSTRUMENTS**

The flight instruments are located on a floating panel directly in front of the pilot's seat. Standard flight instrumentation includes attitude and directional gyros, airspeed, altimeter, vertical speed, turn coordinator, and a clock. A magnetic compass is mounted above the instrument panel and an outside air temperature indicator is located on the left side panel. Located on the right side of the instrument panel is the standard pressure gage for the instrument air system.



## **POWER PLANT INSTRUMENTS**

Most of the engine instruments are located in the upper center of the instrument panel. The standard indicators for each engine are as follows: tachometers, manifold pressure, fuel flow, fuel quantity, and loadmeters. Other indicators such as the exhaust gas temperature system, the propeller deice ammeter (or propeller alcohol quantity and deice pressure) are usually installed on the right side of the instrument panel. Two multi-purpose instruments, one for each engine, indicate cylinder head temperature, oil pressure, and oil temperature.

## **GROUND CONTROL**

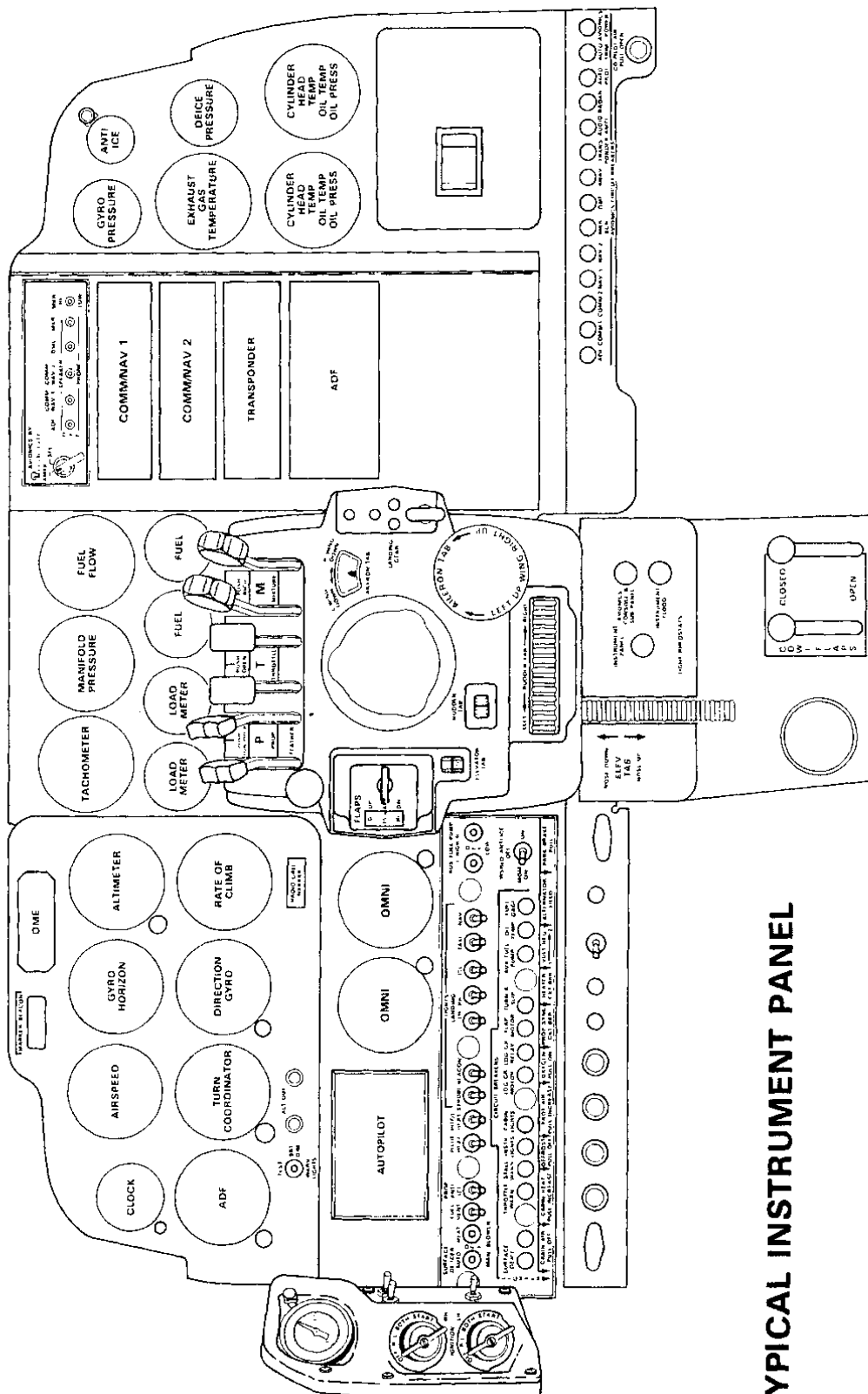
Spring-loaded linkage from the nose gear to the adjustable rudder pedals allows for nose wheel steering. Smooth turning is accomplished by allowing the airplane to roll while depressing the appropriate rudder pedal. The minimum wing tip turning radius, using partial braking action and differential power, is 29 feet 6 inches.

## **WING FLAPS**

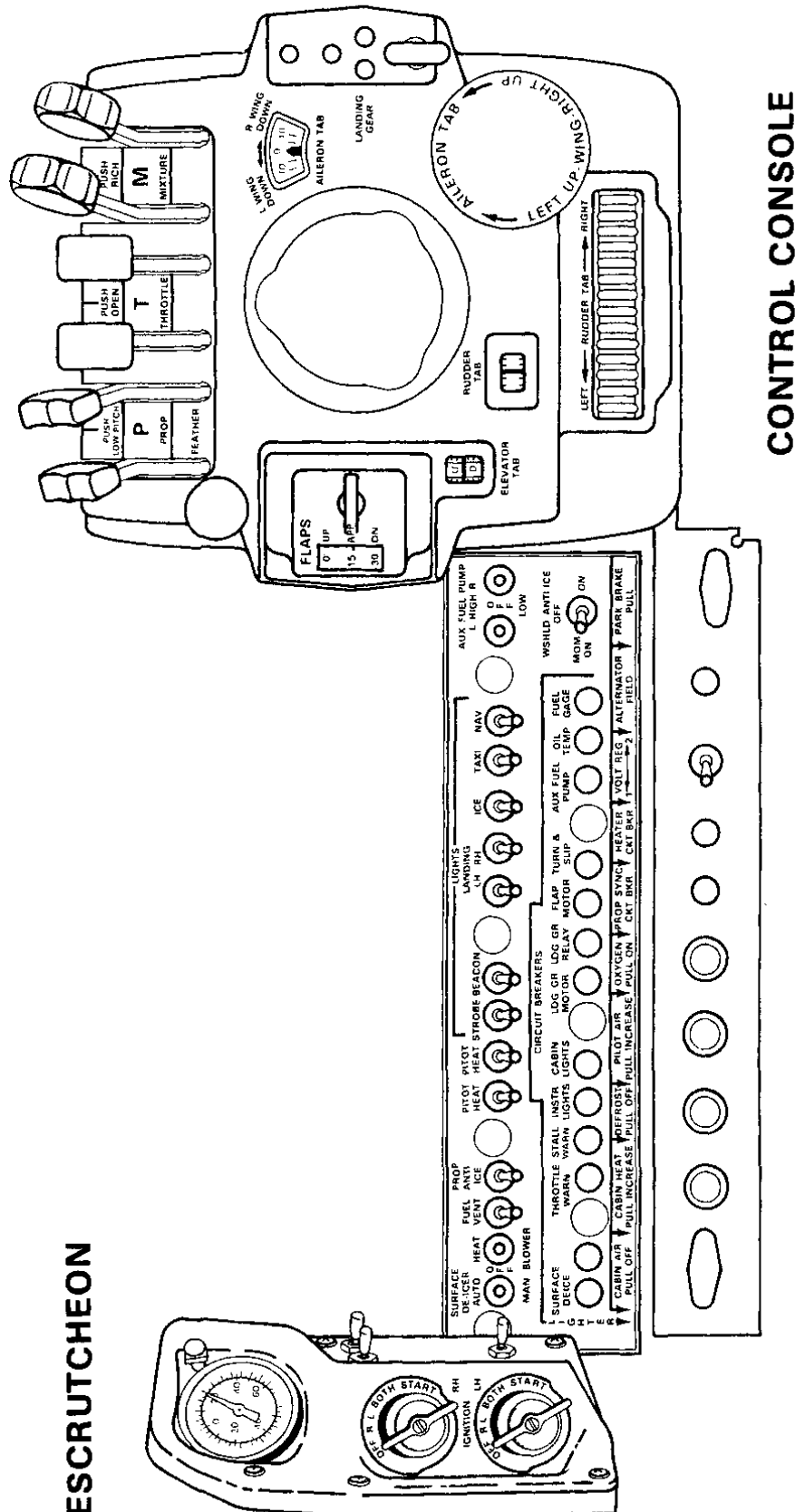
The wing flaps have three positions; UP, 15° (approach), and DOWN (30°), with no intermediate positions. A flap position indicator and a control switch are located on the left side of the control console. The switch must be pulled out of a detent to change the flap position. The flaps will move to either position selected from any previously selected position.

# Section VII Systems Description

## BEECHCRAFT Baron B55 Serial TC 2003 and After



TYPICAL INSTRUMENT PANEL



## **LANDING GEAR SYSTEM**

### *CAUTION*

Never taxi with a flat strut.

The landing gear is operated through adjustable linkage connected to an actuator assembly mounted beneath the front seats. The actuator assembly is driven by an electric motor. The landing gear may be electrically retracted and extended, and may be extended manually.

### **CONTROL SWITCH**

The landing gear is controlled by a two-position switch on the right side of the control console. The switch handle must be pulled out of the safety detent before it can be moved to the opposite position. Never operate the landing gear electrically with the handcrank engaged.

### **POSITION INDICATORS**

Landing gear position lights are located above the control switch. Three green lights, one for each gear, are illuminated whenever the landing gears are down and locked. The red light illuminates anytime one or all of the landing gears are in transit or in any intermediate position. All of the lights will be extinguished when the landing gear is up and locked.

The switch placarded TEST-BRT-DIM-WARN LIGHTS, located on the pilot's floating instrument panel, controls the illumination intensity and testing of the lamps. When the switch is held to the TEST position, the warning lights and the landing gear position indicator lights are energized in order to verify that they illuminate. To improve the illumination of the landing gear position indicator lights during certain lighting conditions, move the switch from DIM to BRT.

## **SAFETY SWITCH**

To prevent inadvertent retraction of the landing gear on the ground, a main strut safety switch opens the control circuit when the strut is compressed.

### ***CAUTION***

Never rely on the safety switch to keep the gear down during taxi or on take-off, landing roll, or in a static position. Always make certain that the landing gear switch is in the down position during these operations.

## **WARNING HORN**

If either or both throttles are retarded below an engine setting sufficient to sustain two engine flight with the landing gear retracted, a warning horn will sound intermittently. During one engine operation, the horn can be silenced by advancing the throttle of the inoperative engine until the throttle warning horn switch opens the circuit.

## **MANUAL EXTENSION**

The landing gear can be manually extended, but not retracted, by operating the handcrank on the rear of the pilot's seat. The landing gear handle must be in the down position and the landing gear MOTOR circuit breaker must be pulled before manually extending the gear. When the electrical system is operative, the landing gear may be checked for full down with the gear position lights, provided the landing gear RELAY circuit breaker is engaged. After the landing gear is down, disengage the handcrank. For electrical retraction of the landing gear after a practice manual extension use procedures outlined in the EMERGENCY PROCEDURES section.

If the landing gear was extended for emergency reasons, do not move any landing gear controls or reset any switches or circuit breakers until the aircraft is on jacks, to prevent a gear retraction on the ground. These procedures are outlined in the EMERGENCY PROCEDURES section.

## **BRAKES**

The brakes on the main landing gear wheels are operated by applying toe pressure to the top of the rudder pedals. The parking brake T-handle control is located just left of the elevator tab wheel on the pilot's 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**

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.

On Serials TC-2003 thru TC-2206 with shuttle valves installed, only the pilot's brake pedals can be used in conjunction with the parking brake system to set the parking brake.

### **CAUTION**

On Serials TC-2003 thru TC-2206 with shuttle valve brake systems installed, continuous brake application of either the pilot's or copilot's brake pedals, in conjunction with an overriding pumping action from the opposite brake pedals, could result in the loss of braking action on the side which continuous pressure is being applied.

The brakes hydraulic fluid reservoir is accessible through the nose baggage door. Fluid level is checked with the dipstick attached to the reservoir cap. The brakes require no adjustments, since the pistons move outward to compensate for lining wear.

## **BAGGAGE/CARGO COMPARTMENTS**

### **AFT BAGGAGE/CARGO COMPARTMENT**

The aft baggage/cargo compartment is accessible through the baggage door on the right side of the fuselage. This area extends aft of the pilot's seats to the rear bulkhead. Because of structural limitations, this area is divided into three sections, each having a different weight limitation. Loading within the baggage/cargo compartment must be in accordance with the data in the WEIGHT AND BALANCE section. All cargo must be secured with the Beech approved cargo retention nets.

### **WARNING**

Do not carry hazardous material anywhere in the airplane.

### **NOSE BAGGAGE/CARGO COMPARTMENT**

The forward baggage/cargo compartment is easily accessible through a large door on the right side of the nose. The door, hinged at the top, swings upward, clear of the loading area. Loading within this area must be within the limitations according to the WEIGHT AND BALANCE section. The nose baggage/cargo compartment incorporates the full width of the fuselage as usable space. This compartment also affords accessibility to the oxygen cylinder and to some of the airplane's avionics. Straps are provided and should be used to secure any baggage or cargo loaded into the nose baggage/cargo compartment.

## **SEATING**

To adjust any of the four standard seats forward or aft, pull up on the release bar below the seat and slide the seat to the desired position. The seat backs of all standard seats can be placed in any of four positions by operating a release lever on the inboard side of each seat. An option is available that provides for the seat backs on all seats (except the pilot's) to be placed in any position from vertical to fully reclined. Outboard armrests for all standard seats are built into the cabin sidewalls. Center armrests can be elevated or positioned flush with the seat cushions. The 3rd and 4th place chairs are equipped with a locking back to accommodate the shoulder harness, and the seat back can be folded over for access by rotating the red handle located on the lower inboard side of the seat back. The optional fifth and sixth seats can be folded up to provide additional floor space, or folded down to provide access to the extended baggage/cargo compartment.

## **SEAT BELTS AND SHOULDER HARNESES**

The shoulder harness is a standard installation for all seats and must 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 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.

The strap is worn over the shoulder and down across the body, where it is fastened by a metal loop into the seat belt buckle. For the pilot seats, the harness strap is contained in an inertia reel attached to the side canopy structure of the cockpit. The inertia reel is covered with an escutcheon and the strap runs up from the reel location to a looped fitting attached to the window frame just aft of the pilot



seats. For the third and fourth passenger seats, the inertia reel is attached into the seat back structure and is covered with the seat back upholstery. The strap runs up the seat back and over the outboard corner of the seat back. For the fifth and sixth passenger seats, the strap is contained in an inertia reel attached to the upper fuselage side structure, just aft of the seat back and is covered with an escutcheon.

#### **NOTE**

The seat belt is independent of the shoulder harness, but the outboard seat belt and the shoulder harness must be connected for stowage when the seat is not occupied.

### **DOORS, WINDOWS AND EXITS**

#### **FORWARD CABIN DOOR**

The airplane has a conventional cabin door on the forward right side of the fuselage and when closed, the outside cabin door handle is spring loaded to fit into a recess in the door to create a flat aerodynamically clean surface. The door may be locked with a key. To open the door from the outside, lift the handle from its recess and pull until the door opens.

To close the cabin door from the inside, observe that the door handle is in the unlocked position. In this position, the latch handle is free to move approximately one inch in either direction before engagement of the locking mechanism. Then grasp the door and firmly pull the door closed. Rotate the door handle fully counterclockwise into the locked position. When the door is properly locked, the door latch handle is free to move approximately one inch in either direction.

**NOTE**

When checking the door latch handle, do not move it far enough to engage the door latch release mechanism.

Press firmly outward at the top rear corner of the door. If any movement of the door is detected, completely open the door and close again following the above instructions.

To open the door from the inside, depress the lock button and rotate the handle clockwise.

**OPENABLE CABIN WINDOWS**

**NOTE**

Windows are to be closed before and during flight.

Serials TC-2003 thru TC-2354, Except TC-2340:

■ ***To Open Window For Ventilation (Only On Ground):***

Release latch front of bar, pull bar at the bottom of the window out and upward. Window will open approximately two inches.

***To Close Window:***

Pull inward and down on the bar at the bottom of the window. Resistance will be felt as the bar moves downward. Continue moving bar downward to its lowest position. Check that bar is locked by the latch.

**NOTE**

■ While closing window, ascertain that the emergency release pin (which allows the window to open fully for emergency exit) is securely in place.

Serials TC-2340 and TC-2355 thru TC-2430:

A plastic covered multi-purpose latch on each openable window is used to provide partial opening of the window for ventilation during ground operations, and also quick unlatching for emergency egress.

*To Open Window For Ventilation (Only On Ground):*

**NOTE**

Red handle for emergency exit only.

1. Lift thumb catch (window will release).
2. Push up and outward until mechanism clicks into detent.

*To Close Window:*

— Pull inward and down until locked. (Listen for detent.)

Serials TC-2431 and after:

*To Open Window For Ventilation (Only On Ground):*

**NOTE**

Red handle for emergency exit only.

1. Rotate lock handle to UNLOCKED position.
2. Lift thumb catch (window will release).
3. Push latch up and outward to over-center position.

*To Close Window:*

1. Pull latch inward and push down until locked. (Listen for detent.)
2. Rotate lock handle to LOCKED position.

**Section VII  
Systems Description**

**BEECHCRAFT Baron B55  
Serial TC-2003 and After**

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## **EMERGENCY EXITS**

To open the emergency exit provided by the openable middle window on each side of the cabin:

Serials TC-2003 thru TC-2354, Except TC-2340:

1. Lift the latch.
2. Pull out the emergency release pin and push the window out.

The above procedure is described on a placard installed below the left and right middle windows.

Serials TC-2340, TC-2355 and after:

1. Remove cover as indicated by placard in the center of the Ventilation/Emergency Exit latch.
2. Rotate handle up as indicated by placard, breaking safety wire, and push window out.

### **NOTE**

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

## **CONTROL LOCKS**

The control column pin assembly is placarded with the installation instructions. Install the assembly with the instructions facing the instrument panel. Placard reading **CONTROLS LOCKED, REMOVE BEFORE FLIGHT** will be facing pilot if properly installed.

## **POWER PLANTS**

The BEECHCRAFT BARON B-55 is powered by two Continental IO-470-L six-cylinder, horizontally opposed, fuel injected engines rated at 260 hp at 2625 rpm.

## **POWER PLANT CONTROLS**

### **PROPELLER, THROTTLE, AND MIXTURE**

The control levers are grouped along the upper face of the control console. Their knobs are shaped so they can be identified by touch. A single controllable friction knob below and to the left of the control levers prevents creeping.

## **INDUCTION AIR**

Induction air is available from filtered ram air or unfiltered alternate air. Filtered ram air enters from above the engine inside the nacelle area. Should the induction air filter become obstructed, a spring-loaded door on the side of the plenum will open automatically and the induction system will operate on alternate air taken from the nacelle area.

## **ENGINE ICE PROTECTION**

Engine ice protection consists of electrothermal fuel vent heaters controlled by a switch on the left panel, and an automatic alternate air induction system.

## **LUBRICATION SYSTEM**

The engine oil system for each engine is the full pressure, wet sump type and has a 12-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.

The oil system may be checked through access doors in the engine cowling. A calibrated dip stick adjacent to the filler cap indicates the oil level. Due to the canted position of the engines, the dip sticks are calibrated for either right or left engines and are not interchangeable.

The oil grades listed in the Approved Engine Oils in the SERVICING section are general recommendations only, and will vary with individual circumstances. The determining factor for choosing the correct grade of oil is the average ambient temperature.

## **COWL FLAPS**

The cowl flap for each engine is controlled by a manual control lever located on the lower center console. The cowl flap is closed when the lever is in the up position and open when the lever is down.

## **PROPELLERS**

The engines are equipped with either two or three blade, full feathering, constant speed, propellers. Springs aided by counterweights move the blades to high pitch. Engine oil under governor-boosted pressure moves the blades to low pitch.

The propellers should be cycled occasionally during cold weather operation. This will help maintain warm oil in the propeller hubs so that the oil will not congeal.

## **PROPELLER SYNCHRONIZER**

The propeller synchronizer automatically matches the rpm of both propellers. The system's range of authority is limited to approximately 25 rpm. Normal governor operation is unchanged but the synchronizer will continuously monitor propeller rpm and adjust one governor as required.

A magnetic pickup mounted in each propeller governor transmits electric pulses to a transistorized control box installed behind the pedestal. The control box converts any pulse rate differences into correction commands, which are transmitted to the appropriate governor.

A toggle switch installed on the pedestal turns the system on. To operate the system, synchronize the propellers in the normal manner and turn the synchronizer on. To change rpm, adjust both propeller controls at the same time. This will keep the setting within the limiting range of the system. If the synchronizer is on but unable to adjust the propeller rpm, the system has reached its range limit. Turn the synchronizer switch off, synchronize the propellers manually, and turn the synchronizer switch on.

## **PROPELLER SYNCHROSCOPE**

A propeller synchroscope, located in the tachometer case, operates to give an indication of synchronization of propellers. If the right propeller is operating at a higher rpm than the left, the face of the synchroscope, a black and white cross pattern, spins in a clockwise rotation. Counterclockwise rotation indicates a higher rpm of the left propeller. This instrument aids the pilot in accomplishing manual synchronization of the propellers.



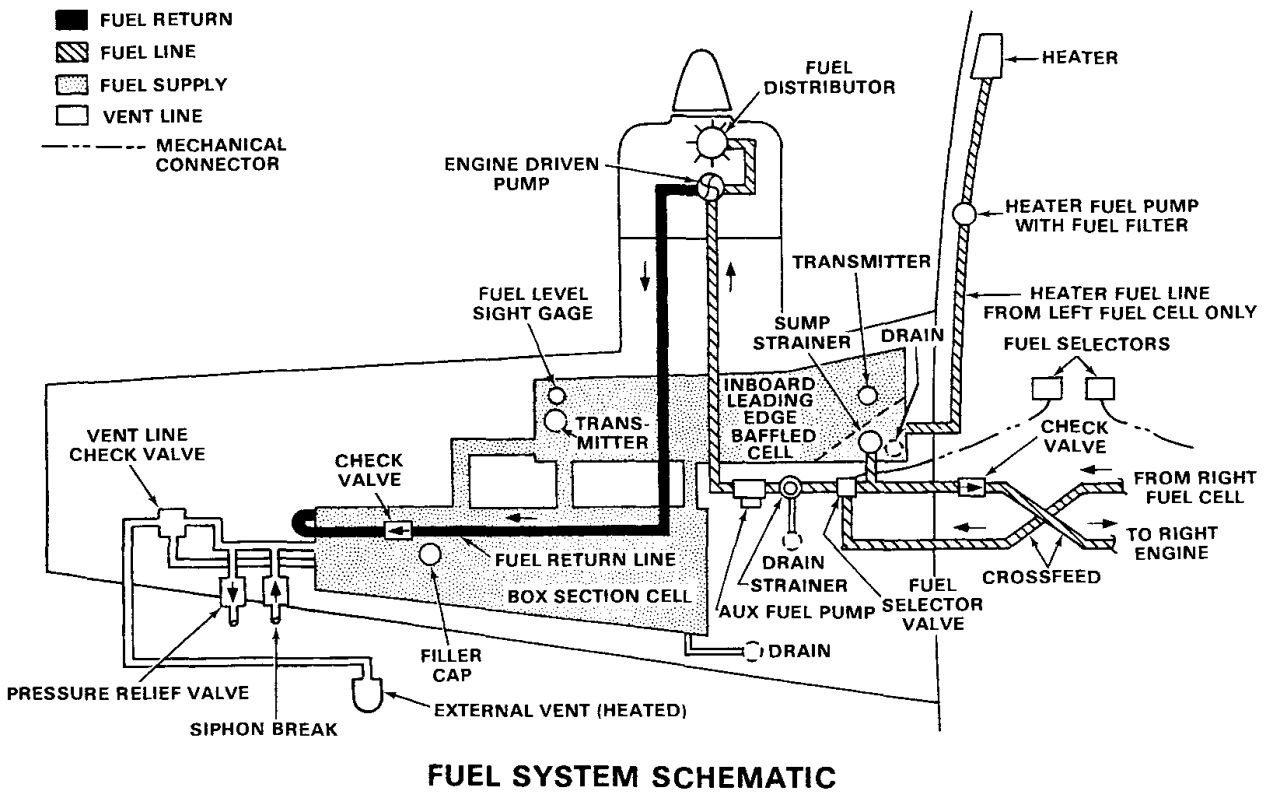
## **FUEL SYSTEM**

The fuel system is an OFF-ON-CROSSFEED arrangement. The fuel selector panel, located on the floor forward of the front seats, contains the fuel selector for each engine and a schematic diagram of fuel flow.

The standard fuel system in the wing leading edge has a capacity of 106 gallons. The optional fuel system has a capacity of 142 gallons. Refer to the LIMITATIONS section for the useable fuel in each system.

A vapor return line returns excess fuel from the engine to its respective wing system. All of the fuel cells, standard or optional, in each wing are interconnected in order to make all the useable fuel in each wing available to its engine when the fuel selector valve is ON. Each wing system is serviced through a single filler. The fuel system is drained at six locations.

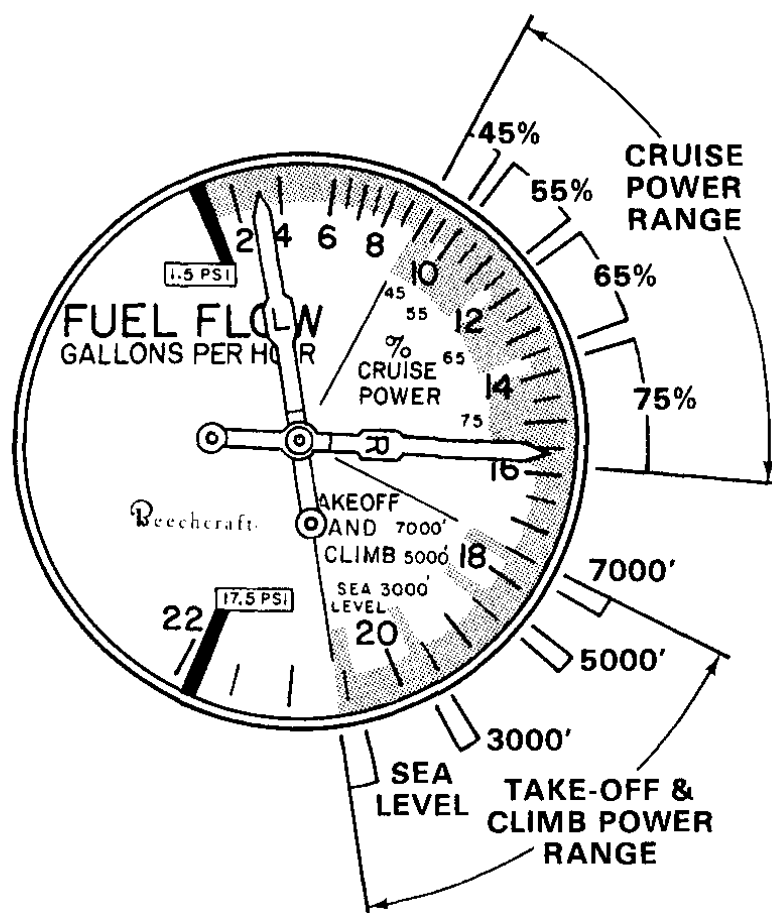
Fuel quantity is measured by float type transmitter units which transmit the common level indication to a single indicator for each respective wing system.



## **FUEL FLOW AND PRESSURE INDICATOR**

**Serials TC-2003 thru TC-2354**

The dual fuel flow indicator on the instrument panel senses fuel pressure at the fuel distributor and is calibrated to indicate fuel flow to each engine in gallons per hour. The green arc indicates the normal fuel flow operating range while the red radials indicate the minimum and maximum allowable fuel pressures.



**FUEL FLOW AND PRESSURE INDICATOR**  
**(Serials TC-2003 thru TC-2354)**

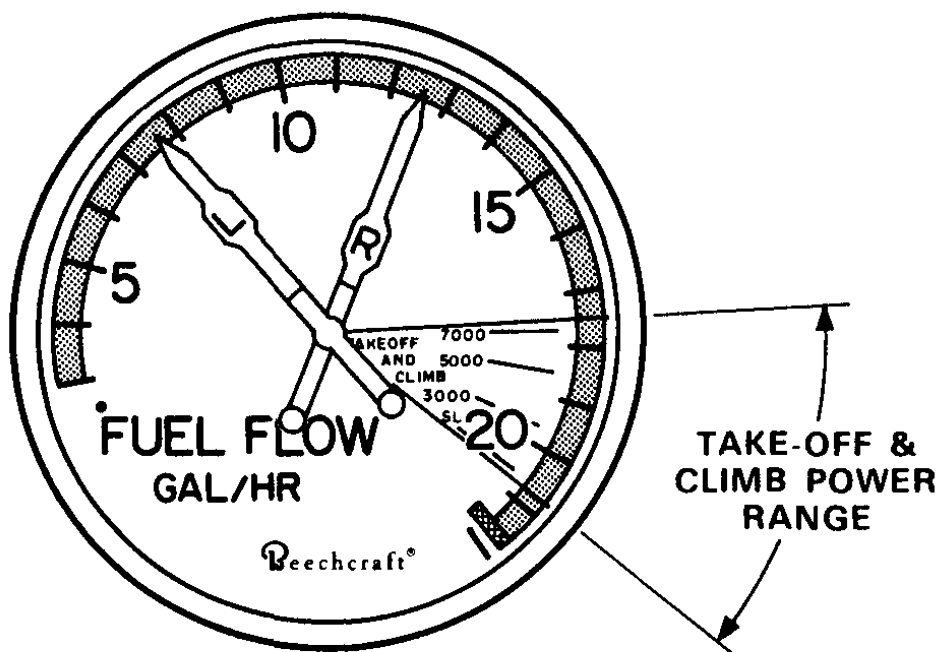
The higher end of the green arc includes a sawtooth segment labeled "TAKE-OFF AND CLIMB" and indicates the approximate fuel flow required for takeoff and climb at sea level, 3000, 5000, and 7000 feet. The pilot should use these markings as a guide only and refer to the performance charts for the exact fuel flow requirements for takeoff, climb at maximum continuous power, or climb at maximum normal operating power.

The lower end of the green arc includes a sawtooth segment labeled "% CRUISE POWER" which indicates the approximate fuel flows for powers ranging from 45% to 75% of maximum continuous power. The lower fuel flow of each sawtooth corresponds to the cruise-lean fuel flow while the higher fuel flow of each sawtooth corresponds to the best power fuel flow. When power is set in accordance with the cruise power setting tables in the PERFORMANCE Section, these sawtooth marks provide approximate percent power information.

#### **FUEL FLOW INDICATOR**

**Serials TC-2355 and after**

The dual fuel flow indicator on the instrument panel is controlled electrically and indicates fuel flow to each engine in gallons per hour. A turbine meter installed in the fuel line rotates in proportion to the fuel flow. The speed of rotation is converted to an electrical signal which is then interpreted by the fuel flow indicator. The green arc indicates the normal operating range while the red radial indicates the maximum allowable fuel flow.



**FUEL FLOW INDICATOR**  
**(Serials TC-2355 and after)**

A segment of fuel flows at the higher end of the green arc is labeled "TAKEOFF AND CLIMB" and indicates the approximate fuel flow required for takeoff and climb at sea level, 3000, 5000, and 7000 feet. The pilot should use these markings as a guide only and refer to the tables in the PERFORMANCE Section for takeoff, climb at maximum continuous power, or climb at maximum normal operating power.

### **FUEL CROSSFEED (One Engine Inoperative Only)**

The fuel lines for the engines are interconnected by cross-feed lines. During normal operation each engine uses its own fuel pumps to draw fuel from its respective wing fuel system. However, on emergency crossfeed operations either engine can consume the available fuel from the opposite side.

The fuel crossfeed system is provided for use during emergency conditions. The system cannot be used to transfer fuel from one wing system to the other. The procedure for using the crossfeed system is described in the EMERGENCY PROCEDURES section.

### **AUXILIARY FUEL PUMPS**

An individual two-speed electric auxiliary fuel pump is provided for each engine. HIGH pressure, OFF or LOW pressure is selected with each auxiliary fuel pump switch on the pilot's subpanel. High pressure is used for providing fuel pressure before starting, and provides near maximum engine performance, should the engine-driven pump fail. Low pressure may be used in any operating mode to eliminate pressure fluctuations resulting from high ambient temperatures and/or high altitudes. The high pressure position should not be selected while the engine is operating except in the event of engine-driven pump failure since the high pressure mode supplies a greater pressure than can be accepted by the injection system during normal operation.

## **PARTIAL FUEL LOADING**

When installed, a visual fuel level sight gage in each wing leading edge, outboard of the engine nacelle, can be used for partial filling or off-loading of fuel. This gage is to be used only when it reads within the calibrated area.

## **FUEL REQUIRED FOR FLIGHT**

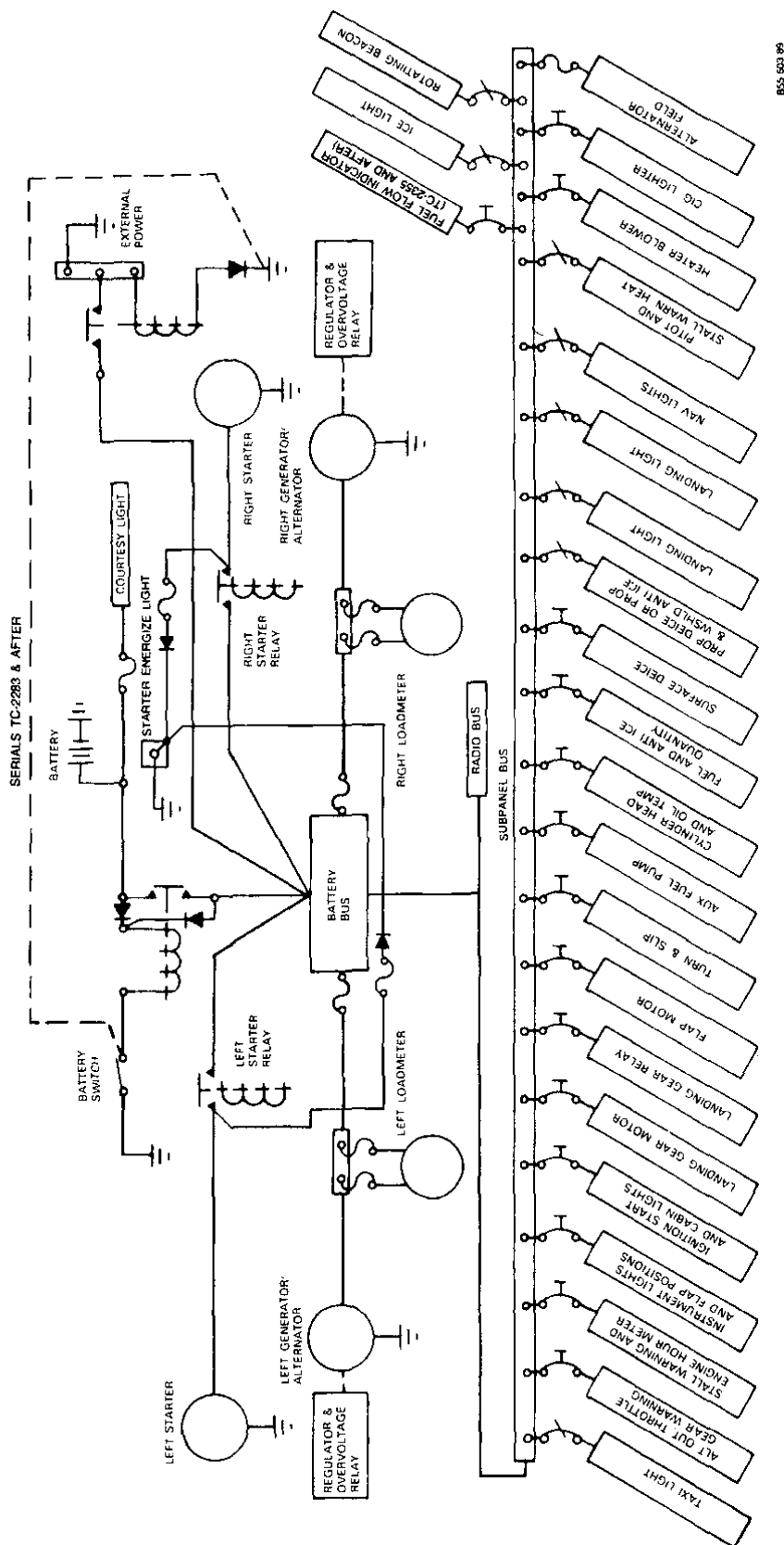
Flight planning and fuel loading is facilitated by the use of fuel quantity indicators that have been coordinated with the usable fuel supply. It is the pilot's responsibility to ascertain that the fuel quantity indicators are functioning and maintaining a reasonable degree of accuracy, and be certain of ample fuel for a flight. A minimum of 13 gallons of fuel is required in each wing system before take-off. An inaccurate indicator could give an erroneous indication of fuel quantity. If the pilot is not sure that at least thirteen gallons are in each wing system, add necessary fuel so that the amount of fuel will not be less than thirteen gallons per wing system at take-off. Plan for an ample margin of fuel for any flight.

## **ELECTRICAL SYSTEM**

In general, the airplane's circuitry is the single-wire, ground return type. The battery magneto-starter, and generator or alternator switches are located on the left side panel. The panel to the left of the control console contains most of the electrical system switches and circuit breakers. Each is placarded as to its function. Avionics circuit breakers are located on the right subpanel.

# Section VII Systems Description

## BEECHCRAFT Baron B55 Serial TC 2003 and After



855 553 96

**POWER DISTRIBUTION SCHEMATIC**



## **BATTERY**

One 17 ampere-hour, 24-volt lead acid battery is standard. Two 25 ampere-hour, 12-volt lead acid batteries, connected in series are offered as options. The battery installation is located beneath the floor of the nose baggage compartment. Battery servicing procedures are described in the **SERVICING** section. The battery can be turned off in flight and the alternator/generators will remain on the line.

## **GENERATORS**

Two 25-ampere, 24-volt generators are standard equipment. The generators are belt-driven from the engine accessory section.

The electrical output of each generator is automatically controlled by an individual voltage regulator and the system paralleling relay. Individual generator output is indicated by two loadmeters on the instrument panel. The generators are protected by current limiters instead of circuit breakers.

## **ALTERNATORS**

Two 50-ampere, 24-volt, belt-driven alternators are controlled by two transistorized electronic voltage regulators. Only one regulator is operable in the system at any one time. The remaining regulator is used as an alternate or standby unit. When switched into the circuit, either regulator will adjust alternator output to the required electrical load, including battery recharging. Selection of the regulators is provided by a two-position selector switch below the pilot's subpanel. The alternators are protected by current limiters instead of circuit breakers.

Individual alternator output is indicated by two loadmeters on the instrument panel. The loadmeters give a percentage reading of the load on the system.

Two warning lights, placarded ALTERNATOR-L-R, located in the floating instrument panel, will illuminate whenever the respective alternator is disconnected from the bus by low voltage or an over-voltage condition or with the switch in the OFF position. On serials TC-2360 and after, the lights will illuminate if the fuse on the AUX terminal of the alternator is blown.

Any time a failure is detected, the appropriate alternator should be turned off. These lights can be tested by the TEST - WARN LIGHT switch, located on the floating instrument panel.

## **STARTERS**

The starters are relay-controlled and are actuated by rotary type, momentary-on switches incorporated in the magneto/start switches located on the pilot's side panel. To energize the starter circuit, hold the magneto/start switch in the START position. After starting, release the switch to the BOTH position.

The warning light placarded STARTER ENERGIZED (serials TC-2340, TC-2355 and after) will illuminate whenever electrical power is being supplied to either the left or right starter. If the light remains illuminated after starting, the starter relay has remained engaged and loss of electrical power may result. The battery master and both alternator switches should be placed in the OFF position if the light remains illuminated after starting. If the light does not illuminate during starting, the indicator system is inoperative and the loadmeters should be monitored to ensure that the starters do not remain energized after starting. This light can be tested by the TEST-WARN LIGHT switch, located on the floating instrument panel.

## **EXTERNAL POWER**

The external power receptacle is located in the outboard side of the left nacelle and accepts a standard AN type plug. The power unit should be capable of delivering at least 300 amperes for starting. Before connecting an external power unit, turn the electrical systems and avionics off to avoid damage due to electrical surges. If the unit does not have a standard AN type plug, check the polarity (negative ground) and connect the positive lead from the external power unit to the center and aft post of the airplane's receptacle. The negative lead connects to the front post. When external power is connected, the battery switch should be turned on. If polarity is reversed, a diode in the coil circuit will prevent contactor operation.

## **LIGHTING SYSTEM**

### **INTERIOR LIGHTING**

A courtesy light located in the door will be illuminated any time the door is in the open position. The cabin dome light is operated by an OFF-ON switch forward of the light. Individual reading lights above the standard third and fourth or the optional fifth and sixth seats are operated by switches between the air and light outlets. Three rheostat switches are located on the control console. One switch adjusts the intensity of the instrument flood lights located under the glareshield. Lighting for the instruments is controlled by the second switch. The third switch regulates the lighting for the electrical panel, avionics panel, and the trim tab indicators.

The magnetic compass light, outside air temperature indicator light and map light are operated by a switch on the pilot's control wheel.

## **EXTERIOR LIGHTING**

The switches for the navigation lights, landing lights, rotating beacons, nose gear taxi light, and wing ice light(s) are grouped along the top of the pilot's subpanel. The landing lights in the leading edge of each wing tip are operated by separate switches. For longer battery and lamp service life, use the landing lights only when necessary. Avoid prolonged operation, during ground maneuvering, which could cause overheating. An optional taxi light is offered as an alternate for use during ground operation. At night, reflections from rotating anti-collision lights on clouds, dense haze, or dust can produce optical illusions and vertigo. The use of these lights may not be advisable under instrument or limited VFR conditions.

## **HEATING AND VENTILATION SYSTEM**

### **CABIN HEATING**

A combustion heater in the nose cone supplies heated air to the cabin. Outlets are located forward of the pilot and copilot seats, at the rear of the copilot's seat, and at the rear of the right passenger seat. The fifth outlet provides heated air for windshield defrosting.

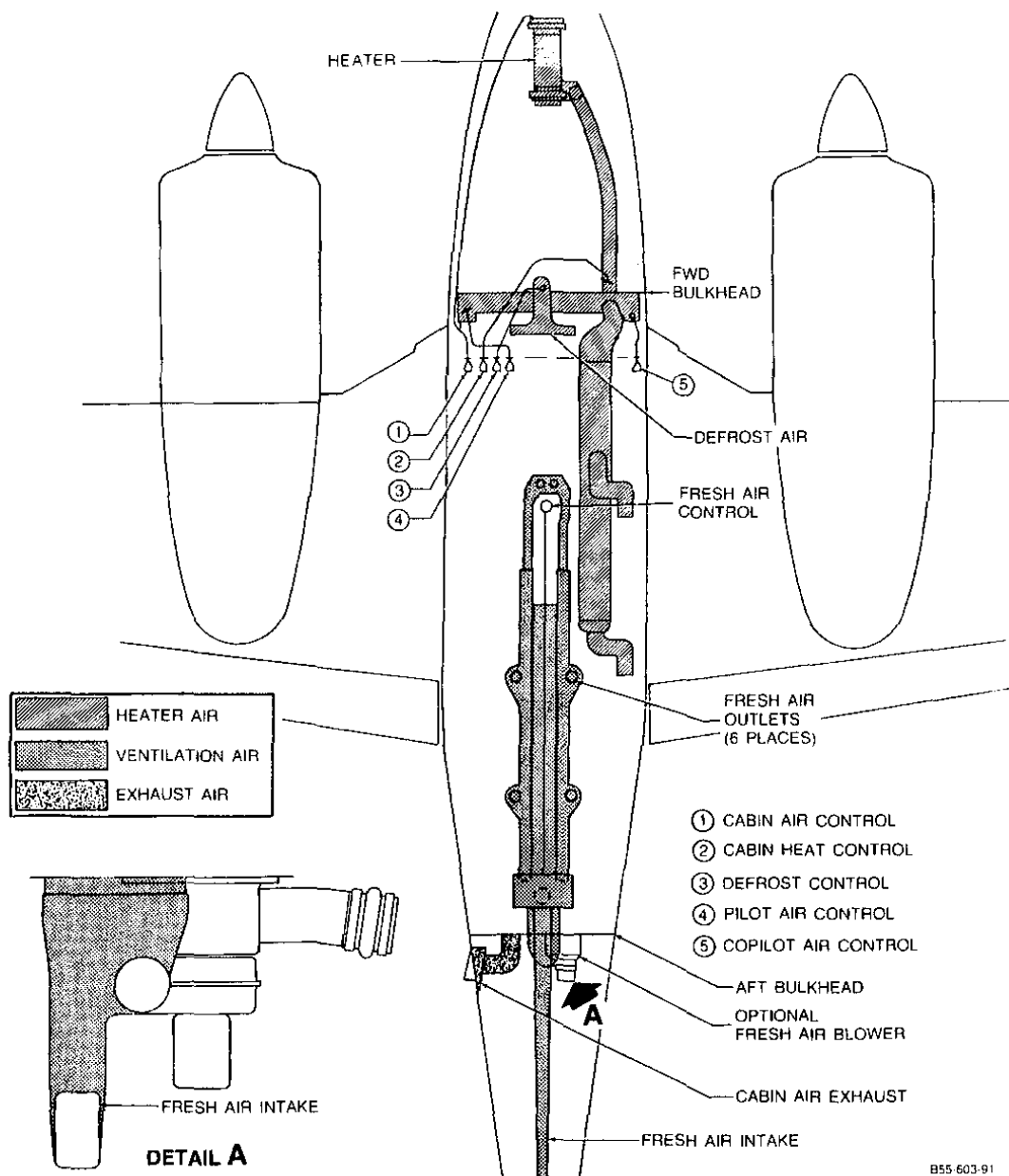
In flight, fresh ram air enters an intake on each side of the nose cone, passes through the heater, and is distributed to the cabin outlets. For ground operation, a blower maintains airflow through the system.

If a malfunction resulting in dangerously high temperatures should occur, a heat actuated circuit breaker, located on the heater, will render the heater system, except the blower, inoperative. **MAKE CERTAIN ANY MALFUNCTION CAUSING THE OVERHEAT CIRCUIT BREAKER TO POP IS CORRECTED BEFORE ATTEMPTING TO OPERATE THE HEATER AGAIN.**

#### *HEATER OPERATION*

1. A three-position switch, placarded **BLOWER, OFF, and HEATER**, is located on the pilot's subpanel. To place the heating system in operation, move the switch to the **HEATER** position.
2. The **CABIN AIR** T-handle control, which regulates the amount of intake air, is below the left side of the pilot's subpanel. Push the **CABIN AIR** control full forward.
3. Pull out the **CABIN HEAT** control to the right of the **CABIN AIR** control to increase the temperature of the heated air. Push the **CABIN HEAT** control in to decrease temperature.
4. For windshield defrosting, push in the **DEFROST** control located to the right of the **CABIN HEAT** control.
5. To direct heated air onto the pilot's feet, pull out the **PILOT AIR** control to the right of the **DEFROST** control.
6. The **COPILOT AIR** control, identical to the **PILOT AIR** control, is located below the right side of the instrument panel.

**Environmental Schematic**



B55-603-91

### *HEAT REGULATION*

For maximum heat, the CABIN AIR control can be pulled partially aft to reduce the volume of incoming cold air and permit the heater to raise the temperature of the admitted air. However, if the CABIN AIR control is pulled aft more than halfway, the heater will not operate.

The volume of air available for the pilot outlet and the copilot outlet can be divided between the two outlets as desired by adjusting each control individually.

More heated air will be available for defrosting by reducing the flow of air from the pilot outlet, copilot outlet, or both.

The PILOT AIR and COPILOT AIR controls can be used to regulate the amount of air distributed to the two rear outlets.

### *HEATER BLOWER*

When the three-position switch on the pilot's subpanel is placed in either the HEATER position or the BLOWER position, the blower will operate if the landing gear is in the extended position and the CABIN AIR control is more than halfway in. The blower will automatically shut off if the landing gear is retracted or the CABIN AIR control is pulled out approximately halfway.

## **CABIN VENTILATION**

In flight, to provide unheated air for the same cabin outlets used for heating, push the CABIN AIR and CABIN HEAT controls forward.

For ventilation during ground operation, push the CABIN AIR control forward and place the three-position switch on the pilot's subpanel in the BLOWER position. An optional fresh air blower (Serials TC-2372 and after) located in the aft fuselage provides additional ventilation through the overhead outlets during ground operations, and automatically shuts off in flight.

## **INDIVIDUAL FRESH AIR OUTLETS**

Fresh ram air from the intake on the left side of the dorsal fairing is ducted to individual outlets above each seat, including the optional fifth and sixth seats. A master control in the overhead panel just aft of the front air outlets enables the pilot to adjust the amount of ram air available to all outlets. The volume of air at each outlet can be regulated by rotating the outlet. Each outlet can be positioned to direct the flow of air as desired.



## **OXYGEN SYSTEM**

### **WARNING**

Proper safety measures must be employed when using oxygen, or a serious fire hazard will be created. **NO SMOKING PERMITTED.**

### **DESCRIPTION**

The recommended masks are provided with the system. The masks are designed to be adjustable to fit the average person.

The oxygen cylinder is located at the aft end of the forward baggage compartment. The system is available with either four, five, or six outlets and with a 49.8 or 66 cu ft oxygen bottle. Supply of oxygen to the system is controlled by a push-pull control on the pilot's subpanel. The pressure indicator shows the supply of oxygen available (1850 psi is nominal pressure for a full supply in the cylinder).

The system regulator is altitude compensated to provide a varying flow of oxygen with altitude. Flow is varied automatically from 0.5 liters per minute at 5,000 feet to 3.5 liters per minute at 30,000 feet. The use of oxygen is recommended to be in accordance with current FAR operating rules.

## **PITOT AND STATIC SYSTEM**

The pitot and static system provides a source of impact and static air for the operation of flight instruments.

### **PITOT SYSTEM**

A standard pitot tube for the pilot's flight instruments is located under the left wing and the optional pitot tube for the copilot's instruments is located under the right wing.

Left and right pitot heat switches, located on the pilot's left subpanel, supply heat to the left and right pitot masts respectively.

The pitot system needs no drain because of the location of the components.

### **STATIC SYSTEM**

Static air is taken from a flush static port located on each side of the aft fuselage. The static air is routed to the rate-of-climb indicator, altimeter and airspeed indicator.

The static air line is drained at the emergency static air source by turning the knob to the emergency static air source position. Return the knob to normal position after the line is completely drained.

The emergency static air source is designed to provide a source of static pressure to the instruments from inside the fuselage should the outside static air ports become blocked. An abnormal reading of the instruments supplied with static air could indicate a restriction in the outside static air ports. A lever on the lower sidewall adjacent to the pilot, is placarded OFF NORMAL, ON EMERGENCY. When it is desired or required to use this alternate source of static air, select the ON EMERGENCY position. To recognize the need and procedures for the use of emergency static air, refer to EMERGENCY PROCEDURES. Airspeed Calibrations and Altimeter Corrections charts are in the PERFORMANCE section.

## **PRESSURE SYSTEM**

Pressure for the flight instruments, deice boots, and autopilot (if installed) is supplied by two, engine-driven, dry, pressure pumps interconnected to form a single system. If either pump fails, check valves automatically close and the remaining pump continues to operate all gyro instruments. A pressure gage on the instrument panel indicates pressure in inches of mercury. Two red buttons on the pressure gage serve as source failure indicators, each for its respective side of the system. The pressure system incorporates two filters per engine. One is located on the rear baffle of the engine to filter intake air to the pressure pump. The other is down stream of the pump and is located aft of the firewall in the upper nacelle. This filter protects the instruments.

## **STALL WARNING**

A stall warning horn on the cabin forward bulkhead sounds a warning signal while there is time for the pilot to correct the attitude. The horn is triggered by a sensing vane on the leading edge of the left wing and is effective in all flight attitudes and at all weights and airspeeds. Irregular and intermittent at first, the warning signal will become steady as the airplane approaches a complete stall.

In icing conditions, stalling airspeeds should be expected to increase due to the distortion of the wing airfoil when ice has accumulated on the airplane. For the same reason, stall warning devices tend to lose their accuracy. The sensing vane is installed on a plate that can be electrically heated, preventing ice from forming on the vane of the transducer. A switch on the pilot's subpanel, placarded PITOT HEAT, supplies power to the heated pitot mast and to the heating plate at the stall warning transducer. How-

ever, any accumulation of ice in the proximity of the stall warning vane reduces the probability of accuracy in the stall warning system whether or not the vane itself is clear of ice. For this reason, it is advisable to maintain an extra margin of airspeed above the stall speed.

## **ICE PROTECTION SYSTEMS**

### **SURFACE DEICE SYSTEM**

Deice boots bonded to the leading edges of the wings and the tail surfaces are operated by engine-driven pump pressure. Compressed air, after passing through the pressure regulator, goes to the distributor valve. When the deice system is not in operation, the distributor valve applies vacuum to the boots to deflate and hold the boots flat against the surface. Then, when the deice system is operated, the distributor valve changes from vacuum to pressure and the boots inflate. After the cycle is completed, the valve returns to vacuum hold down.

A three-position, spring loaded switch, with a center OFF position, a MAN (manual) down position, and an up AUTO (automatic) position, controls the system. When the switch is in the AUTO position, the deice boots inflate for a period of five to six seconds, then deflate automatically and return to the vacuum hold down position. The switch must be tripped for each complete cycle. In the MAN position the deice boots inflate as long as the switch is held in this position. When the switch is released, the boots deflate and go to the vacuum hold down condition.

Deice boots are designed to remove ice after it has accumulated, rather than prevent its formation. If the rate of ice accumulation is slow, best results are obtained by leaving the deice system off until 1/2 to 1 inch of ice accumulates. Bridging can occur if boots are actuated too early or too frequently. Best results are obtained by applying a cycle of the AUTO position each 60 seconds to avoid the possibility of ice growing outside the contour of the inflated boots preventing ice removal.

The wing ice light(s), used to check for ice accumulation during night operation, illuminates the wing leading edge. The light switch is on the pilot's subpanel.

#### **PROPELLER AND WINDSHIELD ANTI-ICE SYSTEM (FLUID FLOW)**

The system is designed to prevent the formation of ice. Always place the system in operation before encountering icing conditions.

Ice is prevented from forming on the propeller blades by wetting the blade anti-ice boots with anti-icing fluid. The anti-ice pump delivers a constant flow of fluid from the supply tank to the blade boots. The pump is controlled by an ON-OFF switch located on the pilot's subpanel.

Windshield anti-ice (when installed) receives anti-ice fluid from the same source as the propeller anti-ice system. Ice is prevented from forming on the windshield by wetting the windshield surface with anti-ice fluid. This combined system is controlled by a three position switch, MOM ON-OFF-ON, located on the pilot's subpanel. The system will not function unless the propeller anti-ice pump switch is turned ON. For windshield system only, the flow is controlled by an ON-OFF switch. An indicator on the right side of the instrument panel indicates the amount of fluid in the supply tank.

With a full reservoir, system endurance is:

|                          |                  |
|--------------------------|------------------|
| Windshield Only .....    | approx. 36 min.  |
| Prop Anti-ice Only ..... | approx. 120 min. |
| Prop & Windshield .....  | approx. 28 min.  |

#### **ELECTROTHERMAL PROPELLER DEICE (2 and 3 BLADES)**

Propeller ice removal is accomplished by the electrically heated deice boots bonded to each propeller blade. The system uses the aircraft electrical power to heat portions of the deice boots in a sequence controlled by a timer. The system is controlled by an ON-OFF switch on the pilot's subpanel. When the system is turned on the ammeter will register 7 to 12 amperes on the 2 blade propeller, or 14 to 18 amperes on the 3 blade propeller. The system can be operated continuously in flight; it will function automatically until the switch is turned off. Propeller imbalance can be relieved by varying rpm. Increase rpm briefly, then return to the desired setting. Repeat if necessary.

#### ***CAUTION***

Do not operate the system with the engines inoperative.

## **PITOT HEAT**

Heating elements are installed in the pitot mast(s), located on the leading edge of the wing. Each heating element is controlled by an individual switch located on the pilot's subpanel. The switches are placarded PITOT HEAT - LT - RT, and should remain off during ground operations, except for testing or for short intervals of time to remove ice or snow from the mast(s).

## **STALL WARNING ANTI-ICE (Optional)**

The mounting pad and the stall warning vane are equipped with a heating element that is activated any time the switch placarded PITOT HEAT - LT, is on.

## **HEATED FUEL VENTS**

The fuel system vents, one located on the underside of each wing outboard of the nacelle, are provided with heating elements controlled by the FUEL VENT switch on the pilot's subpanel.

## **ENGINE BREAK-IN INFORMATION**

Use a straight mineral oil as recommended by the engine manufacturer throughout the break-in period. Drain the initial oil at 20 to 30 hours, replace with new mineral oil which is to be used until oil consumption stabilizes, usually a total period of about 50 hours.

Drain and replace the engine oil as recommended in HANDLING, SERVICING AND MAINTENANCE. If operating conditions are unusually dusty or dirty, more frequent oil changes may be necessary. Oil changes are more critical during the break-in period than at any other time.

Use full throttle at recommended rpm for every takeoff and maintain until at least 400 feet AGL, then reduce as necessary for cruise climb or cruise. Maintain the highest power recommended for cruise operations during the break-in period, avoiding altitudes above 8000 feet. Interrupt cruise power every 30 minutes or so by smoothly advancing to take-off power settings for about 30 seconds, then returning to cruise power settings.

Avoid long power-off descents especially during the break-in period. Maintain sufficient power during descent to permit cylinder head temperatures to remain in the green arc.

Minimize ground operation time, especially during warm weather. During the break-in period, avoid engine idling in excess of 15 minutes, especially in high ambient temperatures.



## **SECTION VIII**

# **HANDLING, SERVICING AND MAINTENANCE**

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## **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 Parts and Service Outlet 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 Parts and Service Outlets 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 there is a question concerning the care of the airplane, it is important to include the airplane serial number in any correspondence. The serial number appears on the model designation placard attached to the right side of the fuselage at the inboard end of the flap.

## **PUBLICATIONS**

The following publications are available through BEEHCRAFT Parts and Service Outlets:

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

### **NOTE**

Service Publications, Reissues, or Revisions are not automatically provided to the holder of this handbook. For information on how to obtain "Revision Service" applicable to this handbook, consult a BEEHCRAFT Parts and Service Outlet or refer to BEEHCRAFT Service Instructions No. 0250-010, Revision III or subsequent revisions.

## **AIRPLANE INSPECTION PERIODS**

1. FAA Required 100 Hour and/or Annual Inspections.
2. BEEHCRAFT Recommended Inspection Guide.
3. Continuing Care Inspection Guide.
4. See "Recommended Servicing Schedule" and Overhaul or Replacement Schedule" for further inspection schedules.

### **NOTE**

Check the wing bolts for proper torque at the first 100 hour inspection and at the first 100 hour inspection after each reinstallation of the wing attach bolts.

**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 Maintenance 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 country of certification for information on 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 or repairs to the airplane must be accomplished by licensed personnel.

## **GROUND HANDLING**

The three-view drawing in Section 1 shows the minimum hangar clearances for a standard airplane. Allowances must be made for any special radio antennas.

### *CAUTION*

To insure adequate propeller clearance, always observe recommended shock strut servicing procedures and tire inflation pressures.

## **TOWING**

One man can move the airplane on a smooth and level surface using a hand tow bar. Attach the tow bar to the tow pin on the nose gear lower torque knee. It is recommended to have someone in the airplane to operate the brakes.

### *CAUTION*

Do not exert force on the propellers, control surfaces, or horizontal stabilizer. When towing with a tug, limit turns to prevent damage to the nose gear. Do not tow when the main gear is obstructed by mud or snow. Also insure the rudder lock is removed.

Care should be used when removing the tow bar to prevent damage to the lubrication fittings on the landing gear.



## **PARKING**

The parking brake T-handle control is located just left of the elevator tab wheel on the pilot's subpanel. To set the parking brakes, pull control out and depress the pilot's toe pedals until firm. Push the control in to release the brakes.

### **NOTE**

Excessive pedal pressure may prevent releasing of the parking brake.

On Serials TC-2003 thru TC-2206 with shuttle valves installed, only the pilot's brake pedals can be used in conjunction with the parking brake system to set the parking brake.

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.

## **TIE-DOWN**

It is advisable to nose the airplane into the wind. Three tie-down lugs are provided: one on the lower side of each wing and a third at the rear of the fuselage.

1. Install the control locks.
2. Chock the main wheels, fore and aft.
3. Using nylon line or chain of sufficient strength, secure the airplane at the three points provided. **DO NOT 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 should be installed at the rear tie-down lug, and a tie-down line attached to the nose gear.

## **MAIN WHEEL JACKING**

1. Check the shock strut for proper inflation to prevent damage to the landing gear door by the jack adapter and to facilitate installation of the adapter.
2. Insert the main wheel jack adapter into the main wheel axle.
3. A scissors-type jack is recommended for raising and lowering the wheel.
4. When lowering the wheel, exercise care to prevent compression of the shock strut, which would force the landing gear door against the jack adapter.

### **NOTE**

Persons should not be in or on the airplane while it is on a main wheel jack.

## **PROLONGED OUT OF SERVICE CARE**

### **STORAGE**

Storage procedures are intended to protect the airplane from deterioration while it is not in use. The primary objectives of these measures are to prevent corrosion and damage from exposure to the elements.

Flyable Storage (7-30 days) has been considered here. For more extended storage periods, consult the Beech Airplane Shop Manual and Continental Service Bulletin M 74-9 or later issue.

**FLYABLE STORAGE - 7 TO 30 DAYS**

***MOORING***

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

***ENGINE PREPARATION FOR STORAGE***

Engines in airplanes that are flown only occasionally tend to exhibit cylinder wall corrosion much more than engines that are flown frequently.

Run engine at least five minutes at 1200 to 1500 rpm with oil and cylinder head temperatures in the normal operating range.

Check for correct oil level and add oil if necessary to bring level to full mark.

***DURING FLYABLE STORAGE***

Each seven days during flyable storage, the propellers shall be rotated by hand. After rotating each engine six revolutions, stop the propellers 60° or 120° from the position they were in.

**WARNING**

Before rotation of propeller blades, ascertain magneto/start switches are OFF, throttles are in the CLOSED position, and mixture controls are in the IDLE CUT-OFF position. Always stand in the clear while turning propellers.

If at the end of 30 days, airplane will not be removed from storage, the engine shall be started and run. The preferred method will be to fly the airplane for 30 minutes, and up to, but not exceeding normal oil and cylinder temperatures.

### *FUEL CELLS*

Fill to capacity to minimize fuel vapor and protect cell inner liners.

### *FLIGHT CONTROL SURFACES*

Lock with internal and external locks.

### *GROUNDING*

Static ground airplane securely and effectively.

### *PITOT TUBE(S)*

Install cover(s).

### *WINDSHIELD AND WINDOWS*

Close all windows and window vents. It is recommended that covers be installed over windshield and windows.

## **PREPARATION FOR SERVICE**

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

If the engine has a total time of more than 25 hours, drain the MIL-C-6529 oil after a ground warm-up and install Tele-dyne Continental Motors recommended oil before flight (MIL-C-6529 is the TCM recommended oil for the first 25 hours of flight).

Preflight the airplane.

## **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 auxiliary 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 battery switch is ON, all avionics and electrical switches OFF, and a battery is in the system before connecting an external power unit. This protects the electronic voltage regulators and associated electrical equipment from voltage transients (power fluctuations).

**RECHARGING THE BATTERY  
(USING AUXILIARY POWER)**

1. Battery switch - ON
2. Generators/Alternators, Electrical and Avionics Equipment - OFF
3. Connect auxiliary power unit
4. Set the output of the external power unit at 27.0 to 28.5 volts
5. Auxiliary power unit - ON

If the battery relay will not close, the battery must be removed from the aircraft for recharging. Check the battery relay control circuit for a malfunction.

**CHECKING ELECTRICAL EQUIPMENT**

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

**NOTE**

If the external power unit has poor voltage regulation or produces voltage transients, the aircraft electrical equipment connected to the unit may be damaged.

## **SERVICING**

### **FUEL SYSTEM**

#### ***FUEL CELLS***

See Consumable Materials for recommended fuel grades.

The 106 gallon fuel system in the wing leading edge has a filler cap in each outboard leading edge. The 142 gallon fuel system has a filler cap in each wing box section. Refer to the LIMITATIONS section for the usable fuel in each system.

Ground the aircraft with a static line before refueling and secure the filler caps immediately after filling. Before letting the airplane stand for several days, it is a good practice to fill the wing fuel system to ensure that the cell inner liners do not dry out and crack, allowing fuel to diffuse through the cell walls. Also, less moisture condensation will occur when fuel cells are full. If the cells are to be drained before storage, a coating of light engine oil should be sprayed or flushed onto the inner liners of the cells as a preservative.

#### ***FUEL DRAINS***

The fuel system has a total of six drains. One snap-type and one flush-type sump drain extends through the bottom of each wing system. There is one flush type drain just forward of each wheel well for the fuel strainer. Each drain should be opened briefly, prior to the first flight of the day and after each refueling, to purge any water from the system.

### ***FUEL STRAINERS***

To preclude the possibility of contaminated fuel, always cap any disconnected fuel lines or fittings. The fuel strainer in each wheel well should be inspected and cleaned with solvent at regular intervals. The frequency of inspection and cleaning will depend upon service conditions, fuel handling cleanliness, and local sand and dust conditions. At each 100-hour inspection the strainer plug should be removed from the fuel injection control valve and the fuel injection control valve screen washed in fresh cleaning solvent. After the strainer plug has been reinstalled and safetied, the installation should be checked for leakage. A leading edge sump strainer, accessible through an access door on the bottom of the wing, should be cleaned periodically.

### **OIL SYSTEM**

The engines are equipped with a wet sump, pressure type oil system. Each engine sump has a capacity of 12 quarts. The oil system may be checked through access doors in the engine cowl. A calibrated dipstick adjacent to the filler cap indicates the oil level. Due to the canted position of the engines, the dipsticks are calibrated for either right or left engines and are not interchangeable.

The oil should be changed every 25 hours under normal operating conditions. The oil drain is accessible through the cowl flap opening. The engines should be warmed to operating temperature to assure complete draining of the oil.

Moisture that may have condensed and settled in the oil sump should be drained occasionally by opening the oil drain plug and allowing a small amount of oil to escape. This is particularly important in winter, when the moisture will collect rapidly and may freeze.



The engine manufacturer recommends the use of ashless dispersant oils. In order to promote faster ring seating and oil control, a straight mineral oil should be used for the first change period or until oil consumption stabilizes. Dispersant oils must meet Teledyne Continental Motors Corporation Specification MHS-24B.

| Aviation Grade Oil | Average Ambient Air Temperature |
|--------------------|---------------------------------|
| SAE 50             | Above 5°C (40°F)                |
| SAE 30             | Below 5°C (40°F)                |

## BATTERY

The battery is accessible by opening the forward baggage compartment door and removing the battery box cover from the floor of the compartment. Check the electrolyte level after each 25 hours of operation and add distilled water as necessary. Avoid filling over the baffles and never fill more than one-quarter inch over the separator tops.

Excessive water consumption may be an indication that the voltage regulators require resetting. The specific gravity of the electrolyte should be checked periodically and maintained within the limits placarded on the battery.

The battery box is vented overboard to dispose of electrolyte and hydrogen gas fumes discharged during the normal charging operation. To ensure disposal of these fumes the vent hose connections at the battery box should be checked frequently for obstructions.

## **TIRES**

An inflation pressure of 50 to 54 psi should be maintained on the 6.50 x 8 main wheel tires. The 5.00 x 5 nose wheel tire should be inflated to 48 to 52 psi. Maintaining recommended tire inflation will minimize tread wear and aid in preventing tire failure caused from running over sharp stones and ruts. When inflating tires, visually inspect them for cracks, breaks, or evidence of internal damage.

### **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 retract system, with the possibility of damage to the landing gear doors and retract mechanism.

## **SHOCK STRUTS**

### ***CAUTION***

**DO NOT** taxi with a flat shock strut.

The shock struts are filled with compressed air and hydraulic fluid. The same procedure is used for servicing both the main and the nose gear shock struts. To service a strut, proceed as follows:

1. Remove the air valve cap, depress the valve core, and allow the strut to fully deflate.

### **WARNING**

Do not unscrew the valve body assembly until all air pressure has been released or it may be blown off with considerable force, causing injury to personnel or damage to equipment.

2. Carefully remove the valve body assembly.
3. Compress the strut and fill through the air valve assembly hole with hydraulic fluid (approximately one pint) until the fluid overflows.
4. Cycle the strut from full extension to compressed and refill. Repeat until no more fluid can be added to the strut in the compressed position.

### **NOTE**

Cycling of the shock strut is necessary to expel any trapped air within the strut housing.

5. Install the air valve assembly.

6. With the airplane resting on the ground and the fuel cells full, inflate the nose gear strut until 4-1/2 inches of the piston are exposed and inflate the main gear struts until 3 inches of the piston are exposed. Rock the airplane gently to prevent possible binding of the piston in the barrel while inflating.

**NOTE**

It is recommended that the nose strut inflation dimension and the tire inflation pressures be carefully adhered to. Properly inflated tires and struts reduce the possibility of ground damage occurring to the propellers. Exercise caution when taxiing over rough surfaces.

7. Remove all foreign material from the exposed piston with a soft cloth moistened with hydraulic fluid.

***CAUTION***

If a compressed air bottle containing air under extremely high pressure is used, exercise care to avoid over-inflating the shock strut.

**WARNING**

**NEVER FILL SHOCK STRUTS WITH OXYGEN.**

## **SHIMMY DAMPER**

The shimmy damper has a reservoir of fluid carried in the piston rod. Two coil springs installed in the piston rod keep fluid in the shimmy damper under pressure. As fluid is lost through leakage it is automatically replenished from the reservoir until the reservoir supply is exhausted.

To check the fluid level in the shimmy damper, insert a wire, approximately 1/32 inch in diameter, through the hole in the disc at the aft end of the piston rod until it touches the bottom of the hole in the floating piston. Mark the wire, remove it, and measure the depth of the insertion. When the shimmy damper is full, insertion depth is 2-3/16 inches, when empty, 3-1/16 inches.

### **NOTE**

The measuring wire should be inserted in the hole in the floating piston rather than against the piston face to give a more accurate reading. To determine if the wire is inserted in the hole in the floating piston, insert the wire several times, noting insertion depth each time. When the wire is inserted in the hole, the depth will be about 1/4 inch greater than when it rests against the piston face.

When the shimmy damper is found empty or nearly empty, it should be refilled. See Shop Manual.

**INTENTIONALLY LEFT BLANK**

## **BRAKES**

The brake hydraulic fluid reservoir is accessible through the nose baggage compartment. A dipstick is attached to the reservoir cap. Refer to Consumable Materials for hydraulic fluid specification.

The brakes require no adjustments since the pistons move to compensate for lining wear. The brake linings should be replaced before the metal back plate is exposed through the abrasive surface. The minimum allowable thickness for the abrasive surface is .010 inch. The brake disc should be replaced when its thickness measures .330 inch.

## **INDUCTION AIR FILTERS**

The filters 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 access plate in the top of the engine cowl.
2. Remove the second access plate on top of the air box and slide out the filter.
3. Remove the filter and clean as noted by the manufacturer's instructions.
4. Reinstall the filter and the plates.

## PROPELLERS

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

Propeller operation, servicing, and maintenance instructions are contained in the propeller owner's manual furnished with the airplane.

### WARNING

When servicing a propeller, always make certain that 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.**

Hartzell propeller  
air pressure settings:

|                    |         |
|--------------------|---------|
|                    | $\pm 1$ |
| 70° to 100°F ..... | 41 psi  |
| 40° to 70°F .....  | 38 psi  |
| 0° to 40°F .....   | 36 psi  |
| -30° to 0°F .....  | 33 psi  |

### PROPELLER BLADE BEARING LUBRICATION

1. Remove the propeller spinner.
2. Remove the safety wire and covers from grease zerks.
3. Remove one zerk from each blade.
4. Lubricate by placing the grease gun fitting on one zerk of each blade and filling until the grease is visible from the zerk opening on the opposite side of the blade.
5. Clean the excess grease from the propeller, reinstall the grease zerks, covers, and safety wire on each blade.
6. Reinstall the spinner.



## **PROPELLER AND WINDSHIELD ANTI-ICE TANK (FLUID)**

The tank is located beneath the floor on the left side of the forward baggage compartment. The filler cap is accessible through an access door in the floor of the compartment. Capacity is 3 U.S. gallons of anti-ice fluid (see Consumable Materials). The tank should be drained and flushed twice a year.

## **OXYGEN SYSTEM**

### **WARNING**

Keep hands, tools, clothing, and oxygen equipment clean and free from grease and oil. **KEEP FIRE AWAY FROM OXYGEN.**

1. Read the pressure indicator on the oxygen console. (The shutoff valve on the oxygen cylinder must be open.) If the oxygen cylinder is equipped with a gage, system pressure may be checked at the cylinder.

### **CAUTION**

Always open the cylinder shutoff valve slowly to prevent damage to the system.

2. Make certain that the oxygen control valve is closed (PUSH IN).
3. Close the cylinder shutoff valve, remove the cap from the filler valve, and attach the recharging outlet.

4. Open the cylinder shutoff valve and fill the cylinder to  $1800 \pm 50$  psi (add 3.5 psi per degree above 70°F; subtract 3.5 psi per degree below 70°F).
5. Close the cylinder shutoff valve, remove the recharging outlet, and replace the filler valve cap.
6. Reopen the cylinder shutoff valve to prepare system for use.

#### *OXYGEN CYLINDER RETESTING*

Oxygen cylinders used in the airplane are of two types. Light weight cylinders, stamped "3HT" on the plate on the side, must be hydrostatically tested every three years and the test date stamped on the cylinder. This bottle has a service life of 4,380 pressurizations or twenty-four years, whichever occurs first, and then must be discarded.

## **MINOR MAINTENANCE**

### **RUBBER SEALS**

To prevent sticking of the rubber seals around the windows, doors, and engine cowling, the seals should be coated with Oakite 6 compound. The compound is noninjurious to paint and can be removed by employing normal cleaning methods.

### **HEATING AND VENTILATING SYSTEM**

The heater fuel pump strainer in the nose wheel well should be removed and cleaned after each 100 hours of airplane operation. Remove the fuel strainer by turning the base of the pump counterclockwise. Wash the strainer in clean unleaded gasoline and dry with compressed air.

The iris valve at the heater blower inlet should be lubricated occasionally with molybdenum disulfide (see Consumable Materials). The valve should never be lubricated with oil or any liquid lubricant which would collect dust.

Do not reset the overheat circuit breaker until a thorough inspection of the system has determined the cause and the malfunction has been corrected.

### **ALTERNATORS**

Since the alternator and electronic 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 electronic voltage regulator.
6. Do not attempt to polarize an alternator.

## **MAGNETOS**

Ordinarily, the magnetos will require only occasional adjustment, lubrication, and breaker point replacement. This work should be done by an authorized BEEHCRAFT Parts and Service Outlet.

### **WARNING**

To be safe, treat the magnetos as hot whenever a switch lead is disconnected at any point; they do not have an internal automatic grounding device. 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**

#### **WARNING**

Do not expose control surface trim tab hinge lines and their pushrod systems to the direct stream or spray of high-pressure, soap-and-water washing equipment. Fluid dispensed at high pressure could remove the protective lubricant, allowing moisture from heavy or prolonged rain to collect at hinge lines, and then to freeze at low temperatures. After high-pressure or hand washing, and at each periodic inspection, lubricate trim tab hinge lines and trim tab pushrod end fittings (Brayco 300 per Federal Specification VV-L-800 preferred). See Consumable Materials.

#### **CAUTION**

When cleaning landing gear areas with solvent, especially if high-pressure equipment is used, exercise care to avoid washing away grease from landing gear components. After washing the landing gear areas with solvent, lubricate all lubrication points, or premature wear may result.

Do not apply wax, polish, rubbing compound, or abrasive cleaner to any uncured painted surface. Use of such items can permanently damage the surface finish. Also, waxes and polishes seal the paint from the air and prevent curing.

Alkyd enamel (sometimes called "automotive enamel"), acrylic enamel, lacquer, and dope

finishes require a curing period of approximately 90 days; Acrylic urethane, polyester urethane, and epoxy finishes undergo a curing process for a period of 30 days after application. Wash uncured painted surfaces with a mild non-detergent soap (MILD detergents can be used on urethane finishes) and cold or lukewarm water only. Use soft cloths, keeping them free of dirt and grime. Any rubbing of the surface should be done gently and held to a minimum to avoid damaging the paint film. Rinse thoroughly with clear water. Stubborn oil or soot deposits may be removed with automotive tar removers.

Prior to cleaning, cover the wheels, making certain the brake discs are covered. Attach the pitot cover securely, and plug or mask off all other openings. Be particularly careful to mask off all static air buttons before washing or waxing. Use special care to avoid removing lubricant from lubricated areas.

When using high-pressure washing equipment, keep the spray or stream clear of wheel bearings, propeller hub bearings, etc., and openings such as pitot tubes, static air buttons, and battery and avionics equipment cooling ducts, which should be securely covered or masked off. Avoid directing high-pressure sprays toward the fuselage, wings, and empennage from the rear, where moisture and chemicals might more easily enter the structure, causing corrosion damage to structural members and moving parts.

Hand washing may be accomplished by flushing away loose dirt with clean water, then washing with a mild soap and water, using soft cleaning cloths or a chamois. Avoid harsh, abrasive, or alkaline soaps or detergents which could cause corrosion or scratches. Thorough clear-water rinsing pre-

vents buildup of cleaning agent residue, which can dull the paint's appearance. To remove oily residue or exhaust soot, use a cloth dampened with an automotive tar remover. Wax or polish the affected area, if necessary.

There is some variation in the procedures required for proper care of the several types of exterior paint. During the curing period, do not make prolonged flights in heavy rain or sleet, and avoid all operating conditions which might cause abrasion or premature finish deterioration. Alkyd enamel, lacquer, and dope finishes must be polished and waxed periodically to maintain luster, and to assure protection from the weather. Acrylic enamel should be waxed, and may be polished, if desired. Acrylic urethane may be waxed for protection from the elements, but should not be polished unless polishing or buffing is required to restore a damaged area. Waxing of polyester urethane finishes, although not required, is permitted; however, never use abrasive cleaner type waxes, polishes, or rubbing compounds, as these products cause eventual deterioration of the characteristic urethane gloss. Epoxy finishes should be waxed on a regular basis, and may be polished and buffed to restore appearance should "chalking" occur. For waxing, select a high quality automotive or aircraft waxing product. Do not use a wax containing silicones, as silicone polishes are difficult to remove from surfaces. A buildup of wax on any exterior paint finish will yellow with age; therefore, wax should be removed periodically. Generally, aliphatic naphtha (see Consumable Materials) is adequate and safe for this purpose.

#### **NOTE**

Before returning the airplane to service, remove all maskings and coverings, and re-lubricate as necessary.

## **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 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 the 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.

## **SURFACE DEICE BOOTS**

The surfaces of the deice boots should be checked for indication of engine oil after servicing and at the end of each flight. Any oil spots that are found should be removed with a non-detergent soap and water solution. Care should be exercised during cleaning. Avoid scrubbing the surface of the boots as this will tend to remove the special graphite surfacing. The deice boots are made of soft, flexible stock which may be damaged if gasoline hoses are dragged over the surface of the boots or if ladders and platforms are rested against them.



## **ENGINE**

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

## **INTERIOR**

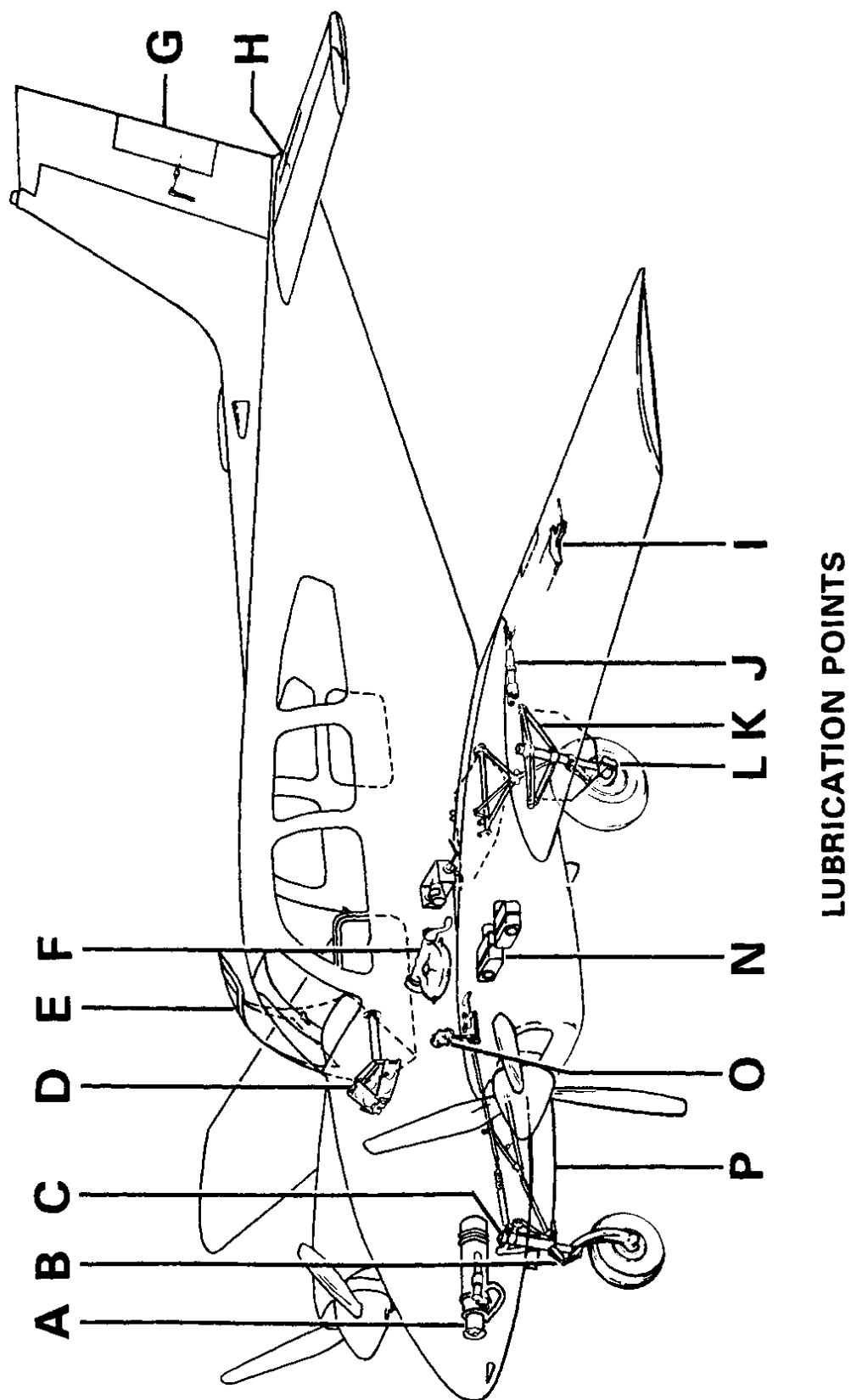
To remove dust and loose dirt from the upholstery, headliner, and carpet, clean the interior regularly with a vacuum cleaner.

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.

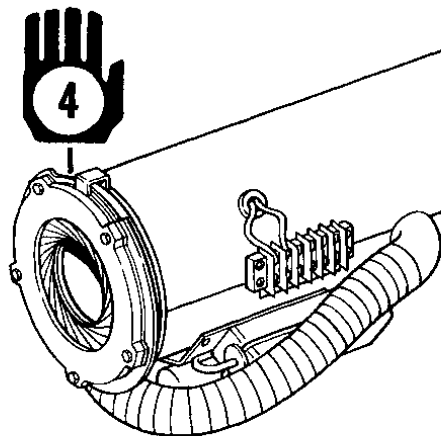
Oily spots may be cleaned with household spot removers, used sparingly. Before using any solvent, read the instructions on the container and test it on an obscure place on the fabric to be cleaned. Never saturate the fabric with a volatile solvent; it may damage the padding and backing materials.

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 panels, and control knobs need only be wiped with a damp cloth. Oil and grease on these surfaces 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, lacquer thinner, or glass cleaner should not be used. These materials will soften the plastic and may cause it to craze.

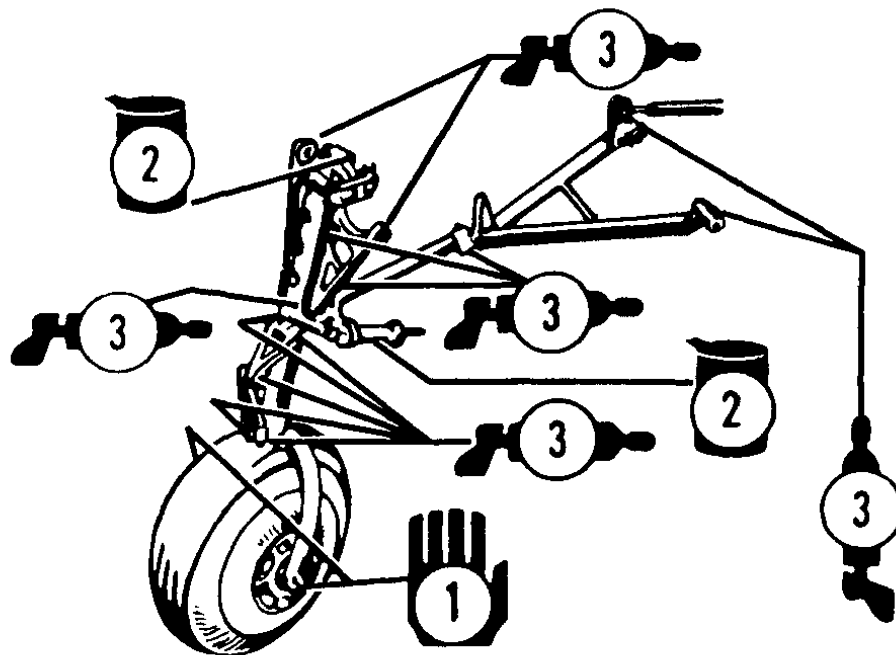


**A**



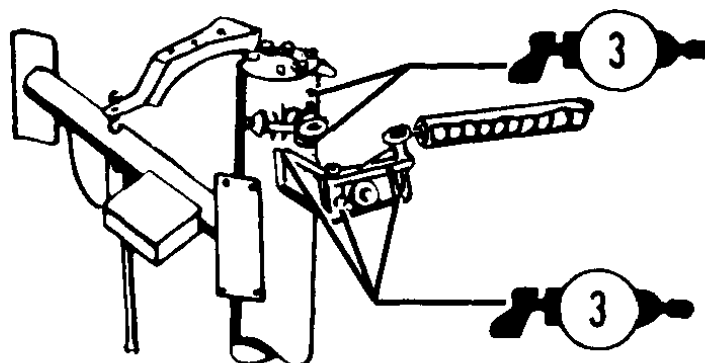
HEATER IRIS VALVE

**B**



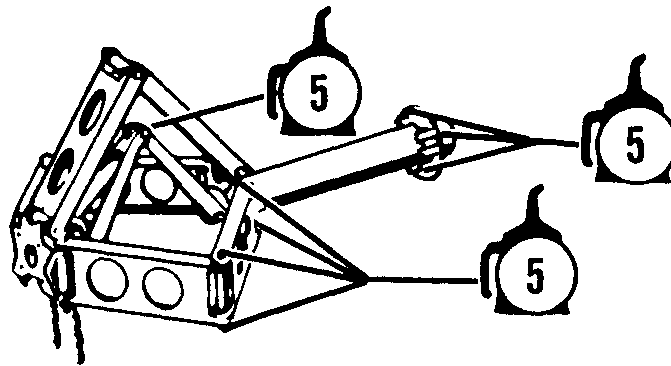
NOSE GEAR RETRACT

**C**



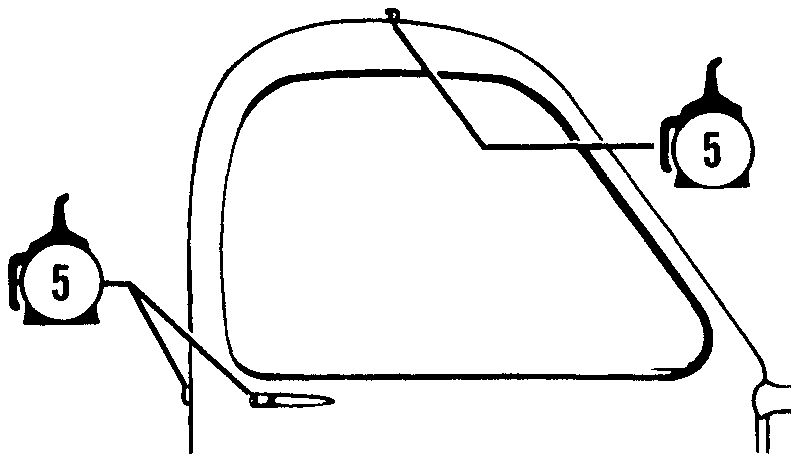
NOSE WHEEL STEERING

**D**



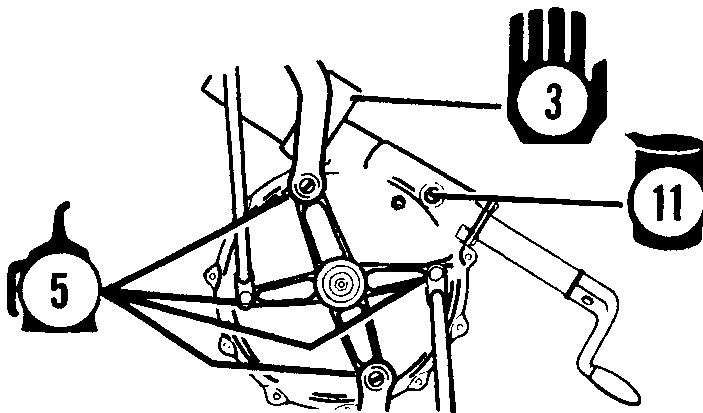
CONTROL COLUMN LINKAGE

**E**



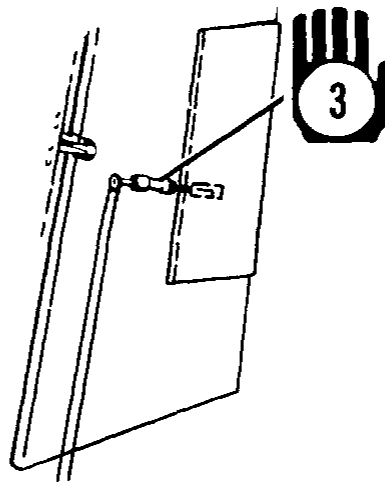
CABIN DOOR

**F**



LANDING GEAR GEAR BOX

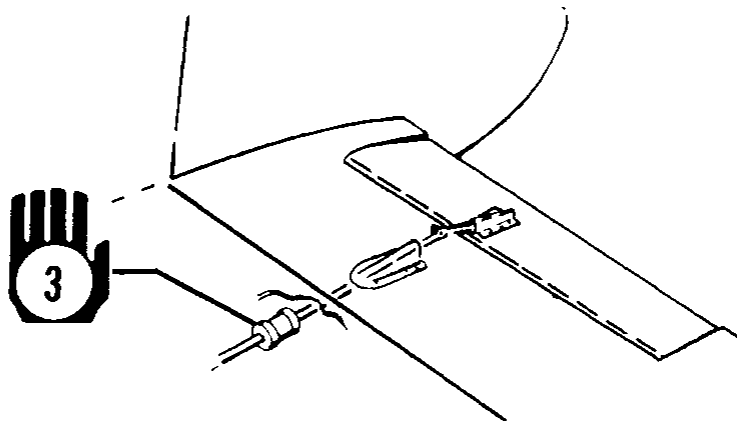
**G**



**RUDDER TRIM**

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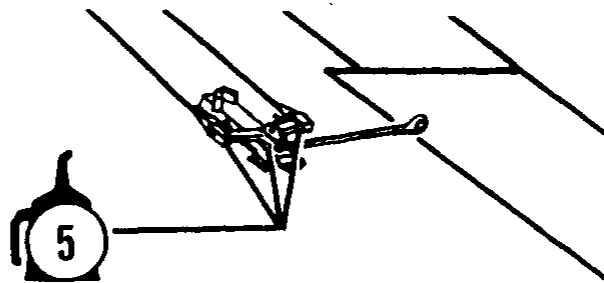
**H**



**ELEVATOR TAB**

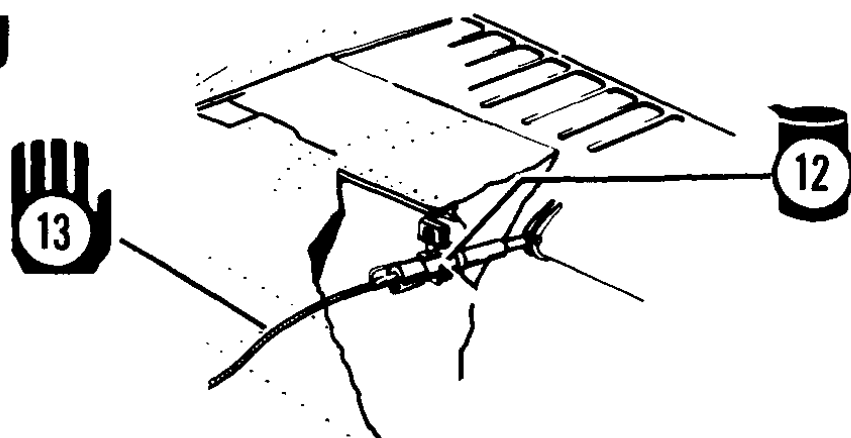
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**I**



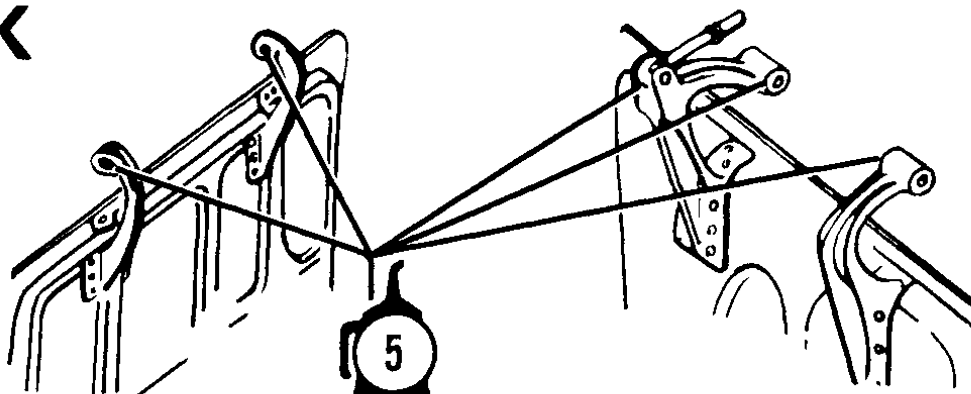
**AILERON BELL CRANKS**

J



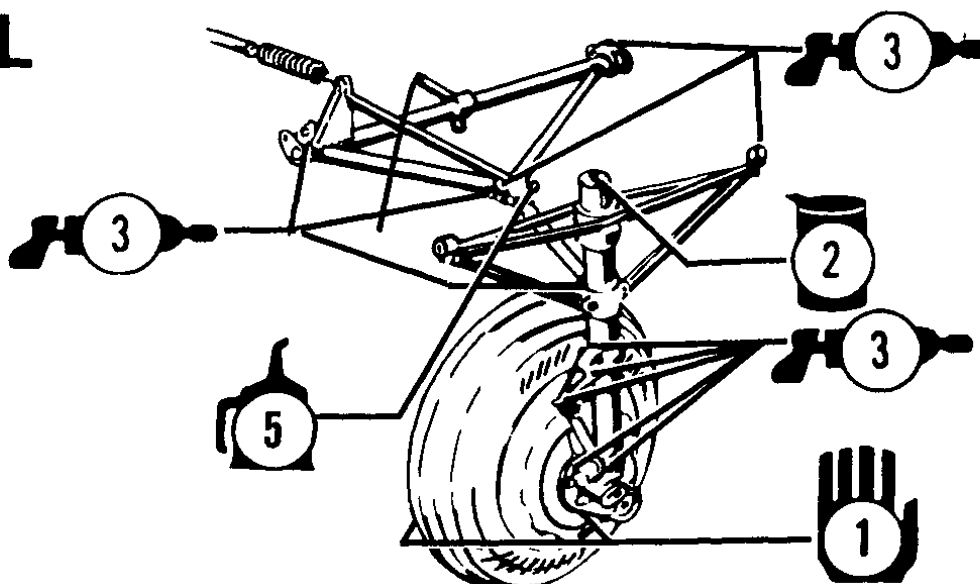
FLAP ACTUATOR AND FLEXIBLE DRIVE SHAFT

K



LANDING GEAR DOOR HINGES

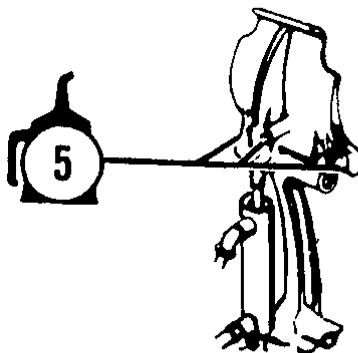
L



LANDING GEAR RETRACT

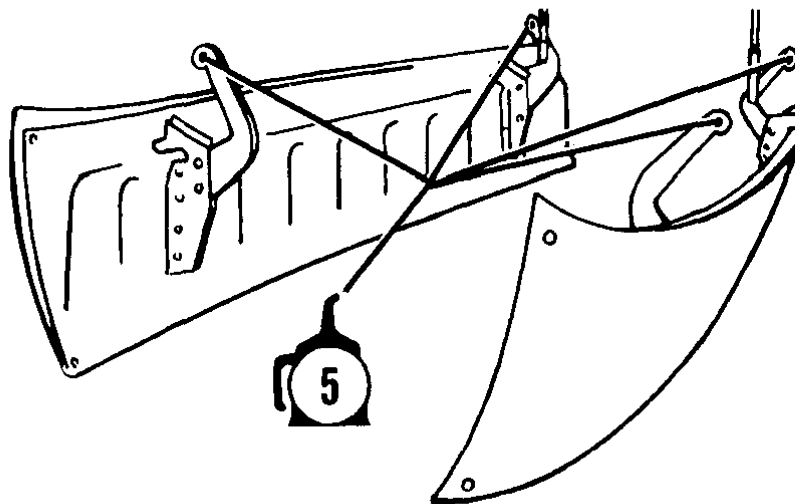
ITEM DELETED

O



RUDDER PEDALS

P



LANDING GEAR DOOR HINGES



HAND OR PACK



ZERK FITTING



FLUID CONTAINER



SQUIRT CAN

*NOTE: Letters are keyed to the Service Schedule; Numbers refer to items in the Consumable Materials Chart.*

## RECOMMENDED SERVICING SCHEDULE

| INTERVAL   | ITEM                        | LOCATION<br>(Letters refer to Lubrication<br>Points Diagram) | (Number refers<br>to item on<br>Consumable Materials) |
|------------|-----------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| Pre-flight | Check engine oil level      | Access door on upper cowling                                 | 6                                                     |
|            | Drain main fuel cell drains | Lower wing surface (leading edge)                            | -                                                     |
|            | Drain fuel strainer drains  | Wing surface fwd of main<br>wheel well                       | -                                                     |
|            | Drain box section cell      | Aft bottom wing surface                                      | -                                                     |
|            | Service fuel cells          | Top of wings, leading edge                                   | 7                                                     |
| 25 Hrs.    | Check battery electrolyte   | Fwd baggage compartment<br>under floor                       | See Shop Manual                                       |
|            | Change engine oil           | Access plate on<br>lower nacelle                             | 6                                                     |
|            | Clean oil screen            | Access door on right<br>side of cowl                         | 9                                                     |



|          |                                           |                                              |      |
|----------|-------------------------------------------|----------------------------------------------|------|
| 50 Hrs.  | Clean induction air filter                | Acc plate on top of cowling                  |      |
| 100 Hrs. | Clean fuel strainers                      | In wheel wells                               | *9   |
|          | Clean fuel injection control valve screen | Access door on side of nacelle               | *9   |
|          | Clean heater fuel filter                  | Nose wheel well                              | *9   |
|          | Lubricate landing gear uplock rollers     | Main landing gear (L)                        | 3    |
|          | Clean and check spark plugs               | Under cowl, both sides engine                | -    |
|          | Check magneto timing                      | Engine compartment (N)                       | -    |
|          | Lubricate landing gear door hinges        | Landing gear wheel wells (K) (P)             | 5    |
|          | Lubricate nose wheel steering mechanism   | Nose wheel well (C)                          | 3    |
|          | Lubricate landing gear retract mechanism  | Nose wheel and main gear wheel wells (B) (L) | 3, 5 |
|          | Lubricate wheel bearings                  | Landing gear (B) (L)                         | 1    |

## RECOMMENDED SERVICING SCHEDULE

| INTERVAL            | ITEM                                   | LOCATION<br>(Letters refer to Lubrication<br>Points Diagram) | (Number refers<br>to item on<br>Consumable Materials) |
|---------------------|----------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| 100 Hrs.<br>(Cont.) | Lubricate cabin door<br>mechanism      | Cabin door latch (E)                                         | 5                                                     |
|                     | Lubricate aileron bell<br>cranks       | Access panel underside<br>wings (I)                          | 5                                                     |
|                     | Lubricate control column<br>linkage    | Forward of instrument<br>panel (D)                           | 5                                                     |
|                     | Lubricate rudder pedals                | Cockpit (O)                                                  | 5                                                     |
|                     | Drain static air lines                 | Left forward cabin sidewall                                  | -                                                     |
|                     | Clean pressure system,<br>inlet filter | Rear engine baffle                                           | *9                                                    |

|          |                                                               |                                                             |                                    |
|----------|---------------------------------------------------------------|-------------------------------------------------------------|------------------------------------|
| 300 Hrs. | Rod end bearings<br>Service landing gear<br>actuator gear box | Control system and<br>landing gear<br>Under front seats (F) | Oil or grease<br>as required<br>11 |
| 500 Hrs. | Replace pressure system<br>filters                            | Aft of engine firewall                                      | Airborne IJ4-7                     |
| 600 Hrs. | Service landing gear<br>motor-reduction gears                 | Under floor, center of<br>cabin (F)                         | 3                                  |
| 900 Hrs  | Lubricate flap actuators<br>Flap flex drive shafts            | Forward of flap<br>underside of wing (J)                    | 12<br>13                           |

## RECOMMENDED SERVICING SCHEDULE

| INTERVAL | ITEM                                                    | LOCATION<br>(Letters refer to Lubrication<br>Points Diagram) | (Number refers<br>to item on<br>Consumable Materials) |
|----------|---------------------------------------------------------|--------------------------------------------------------------|-------------------------------------------------------|
| As Req.  | Service wing fuel system                                | At wing fillers                                              | 7                                                     |
|          | Service propeller/wind-<br>shield anti-ice<br>reservoir | Under left floorboard,<br>forward baggage<br>compartment     | 8                                                     |
|          | Service oxygen cylinder                                 | Nose baggage compartment                                     | 18                                                    |
|          | Service brake fluid<br>reservoir                        | Nose baggage compartment                                     | 2                                                     |
|          | Drain moisture from<br>engine oil sump                  | Through cowl flap opening                                    | -                                                     |
|          | Service main gear struts                                | Top of each strut (L)                                        | 2                                                     |
|          | Service nose gear strut                                 | Top of strut (B)                                             | 2                                                     |
|          | Service shimmy damper                                   | Nose landing gear (B)                                        | 2                                                     |
|          | Check brake lining wear                                 | Main landing gear wheels                                     | -                                                     |
|          | Lubricate heater iris                                   | Forward nose compart-<br>ment (A)                            | 4                                                     |

Section VIII  
Handling, Serv - MaintBEECHCRAFT Baron B55  
Serial TC 2003 and After

|   |                                                     |                                                                     |   |
|---|-----------------------------------------------------|---------------------------------------------------------------------|---|
| † | Battery for emergency locator transmitter (Replace) | On right side of aft fuselage access through left side access panel | - |
|---|-----------------------------------------------------|---------------------------------------------------------------------|---|

† Rechargeable Batteries: Recharge after one cumulative hour of use or after 50% of the useful charge life.

Non-Rechargeable Batteries: Replace after one cumulative hour or after 50% of the useful life.

\*Clean with solvent and blow dry with compressed air.

## **CONSUMABLE MATERIALS**

Only the basic number of each Military Specification is included in the Consumable Materials Chart. No attempt has been made to update the basic number with the letter suffix that designates the current issues of the various specifications.

Vendors listed as meeting Federal and Military Specifications are provided as reference only and are not specifically recommended by Beech Aircraft Corporation; consequently, any product conforming to the specification listed may be used. The products listed below have been tested and approved for aviation usage by Beech Aircraft Corporation, by the vendor, or by compliance with the applicable specifications. Other products that are locally procurable which conform to the requirements of the applicable Military Specification may be used even though not specifically included herein.

It is the responsibility of the operator/user to determine the current revision of the applicable Military Specification prior to usage of that item. This determination may be made by contacting the vendor of a specific item.

## **CONSUMABLE MATERIALS**

| <b>ITEM</b> | <b>MATERIAL</b>                     | <b>SPECIFICATION</b>              |
|-------------|-------------------------------------|-----------------------------------|
| 1.          | Lubricating Grease<br>Wheel Bearing | Aeroshell No. 5 or<br>MIL-G-81322 |

### ***CAUTION***

Do not mix Aeroshell No. 5 with MIL-G-81322.  
Thoroughly clean grease from bearings and bearing area before changing grease.

**BEECHCRAFT Baron B55  
Serial TC 2003 and After**

**Section VIII  
Handling, Serv - Maint**

| ITEM  | MATERIAL                                                    | SPECIFICATION                                                                   |
|-------|-------------------------------------------------------------|---------------------------------------------------------------------------------|
| 2.    | Hydraulic Fluid                                             | MIL-H-5606                                                                      |
| *3.   | Lubricating Grease,<br>General Purpose,<br>Wide Temperature | MIL-G-81322                                                                     |
| 4.    | Molybdenum Disulfide                                        | MIL-M-7866                                                                      |
| 5.    | Lubricating Oil                                             | SAE No. 20 or<br>SAE 10W-30                                                     |
| **6.  | Engine Oil                                                  | SAE 30 (Below 40°F)<br>SAE 50 (Above 40°F)<br>Approved Multi-<br>viscosity Oils |
| ***7. | Engine Fuel                                                 | Grade 100LL (Blue)<br>preferred, 100<br>(Green)                                 |
| 8.    | Anti-Ice Fluid                                              | MIL-F-5566                                                                      |
| 9.    | Solvent                                                     | Federal Specification,<br>PD680                                                 |
| 10.   | Lubricant                                                   | Scintilla 10-86527                                                              |
| 11.   | Lubricant                                                   | Mobil Compound GG<br>or Mobil 636                                               |
| 12.   | Lubricating Oil, Gear                                       | MIL-L-10324, or<br>MIL-L-2105C,<br>Grade 75W                                    |

**Section VIII**  
**Handling, Serv - Maint**

**BEECHCRAFT Baron B55**  
**Serial TC 2003 and After**

| ITEM                       | MATERIAL                                                                           | SPECIFICATION                                              |
|----------------------------|------------------------------------------------------------------------------------|------------------------------------------------------------|
| 13.                        | Grease, Aircraft and Instrument                                                    | MIL-G-23827                                                |
| †14.                       | Lubricant, Rubber Seal                                                             | Oakite 6 Compound                                          |
| 15.                        | Naptha, Aliphatic                                                                  | Federal Specification, TT-N-95                             |
| ††16.                      | Tape, Antiseize Tetrafluorethylene                                                 | MIL-T-27730                                                |
| 17.                        | Leak Test Compound, Oxygen Systems                                                 | MIL-L-25567                                                |
| 18.                        | Oxygen, Aviator's Breathing                                                        | MIL-O-27210                                                |
| 19.                        | Lubricating Oil, General Purpose, Preservative (Water-Displacing, Low Temperature) | ●Brayco 300 per Federal Specification VV-L-800 (Preferred) |
| Alternates for Brayco 300: |                                                                                    |                                                            |
|                            | Lubricant                                                                          | ●●CRC 3-36<br>●●●LPS No. 1<br>●●●●WD-40                    |



- \* In extremely cold climates use MIL-G-23827 grease in place of MIL-G-81322. (These greases harmful to paint.)
- \*\* Ashless dispersant oil (latest revision of Teledyne Continental Motors Corp. Spec. MHS-24) recommended; straight mineral oils recommended during break-in period. See servicing data.
- \*\*\* If 100LL grade fuel (blue) is not available, use 100 (green) as minimum grade. See Engine Manufacturer's Service Letter for recommended maintenance and servicing techniques.
- † Product of Oakite Products, Inc., 50 Valley Road, Berkley Heights, N.J. 07922.
- †† For sealing tapered pipe threads on high pressure oxygen lines.
  - Product of Bray Oil Co.,  
1925 North Marianna  
Los Angeles, Calif. 90032
  - Product of CRC Chemicals, Inc.,  
Warminster, Pa. 18974
  - Product of LPS Research Laboratories, Inc.,  
2050 Cotner Ave,  
W. Los Angeles, Calif. 90025
  - Product of WD-40 Company,  
1061 Cudahy Place,  
San Diego, Calif. 92110

**APPROVED ENGINE OILS**

| <i>COMPANY</i>                   | <i>BRAND NAME</i>                                                                                                                                                                           |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BP Oil Corporation               | BP Aero Oil D65/80                                                                                                                                                                          |
| Castrol Limited<br>(Australia)   | Grade 40, Castrolaero AD, Type III<br>Grade 50, Castrolaero AD, Type II                                                                                                                     |
| Continental Oil Co.              | Conoco Aero S(SAE 10W30)                                                                                                                                                                    |
| Delta Petroleum Co.              | Delta Avoil - Grades 30, 40 & 50                                                                                                                                                            |
| Gulf Oil Corporation             | Gulfpride Aviation AD                                                                                                                                                                       |
| Humble Oil & Refining<br>Co.     | Esso Aviation Oil<br>Enco Aviation Oil                                                                                                                                                      |
| Pennzoil Company                 | Pennzoil Aircraft Engine Oil<br>Heavy Duty Dispersant<br>Grades 30, 40, & 50                                                                                                                |
| Phillips Petroleum Co.           | Phillips 66 Aviation Oil Type A                                                                                                                                                             |
| Quaker State Oil &<br>Ref. Corp. | Quaker State AD Aviation Engine<br>Oil Grades 20W/30, 40 & 50                                                                                                                               |
| Sinclair Refining Co.            | Sinclair Avoil 20W40                                                                                                                                                                        |
| Shell Oil Co.                    | Aeroshell Oil W (in 4 grades)<br>Grade 120 (Nominal SAE 60)<br>Military Grade 1120<br>Grade 100 (Nominal SAE 50)<br>Military Grade 1100<br>Grade 80 (Nominal SAE 40)<br>Military Grade 1080 |

***COMPANY***

***BRAND NAME***

Grade 65 (Nominal SAE 20 or 30)  
Military Grade 1065

Socony - Mobil

Mobil Aero Oil 65  
Mobil Aero Oil 80  
Mobil Aero Oil 100  
Mobil Aero Oil 120

Texaco, Inc.

Texaco Aircraft Engine Oil  
Premium AD, Grades 65, 80, 100

Union Oil Co. of  
California

Union Engine Oil H D Grades  
80 & 100

This chart lists all oils which were certified as meeting the requirements of Teledyne Continental Motors Corporation Specification MHS-24B at the time this handbook was published. Any other oil which conforms to this specification may be used.

**BULB REPLACEMENT GUIDE**

| LOCATION                      | NUMBER               |
|-------------------------------|----------------------|
| Alternator out light          | 327                  |
| Compass light                 | 327                  |
| Dome light, cabin             | 1864                 |
| Electrical panel light        | 327                  |
| Flap position indicator light | 327                  |
| Ice light                     | A-7079B-24           |
| Instrument light, flood       | 313                  |
| Instrument light, post        | 327                  |
| Landing gear position light   | 327                  |
| Landing light                 | 4596                 |
| Map light                     | 303                  |
| Navigation light, tail        | 1203                 |
| Navigation light, wing        | MS25309-7512         |
| Reading light                 | 303                  |
| Rotating beacon               | A-7079B-24           |
| Strobe light, tail            | Refer to shop manual |
| Strobe light, wing            | Refer to shop manual |
| Tab position indicator light  | 1819                 |
| Taxi light                    | 4596                 |

## **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**

|                        |                                 |
|------------------------|---------------------------------|
| Main gear assembly     | Every 2000 hours                |
| Nose gear assembly     | Every 2000 hours                |
| Actuator assembly      | Every 4000 hours                |
| Retract motor          | Every 2000 hours                |
| Retract motor brushes  | Every 500 hours or on condition |
| Shimmy damper          | Every 1000 hours                |
| Wheels and tires       | On condition                    |
| Brake assembly         | On condition                    |
| Brake lining           | On condition                    |
| Master cylinder        | On condition                    |
| Shuttle valve assembly | On condition                    |
| Parking brake valve    | On condition                    |
| All hose               | On condition                    |

**POWER PLANT**

**NOTE**

When an engine has been overhauled, or a new engine installed, it is recommended that lower power settings not be used until oil consumption has stabilized. The average time for piston ring sealing is approximately 50 hours.

|                                  |                               |
|----------------------------------|-------------------------------|
| Engine                           | *Every 1500 hours             |
| Engine controls                  | On condition                  |
| Engine vibration isolator mounts | Engine change or on condition |
| Exhaust system                   | On condition                  |
| Engine driven fuel pump          | 1500                          |

| <b>COMPONENT</b>       | <b>OVERHAUL OR REPLACE</b>                                                                          |
|------------------------|-----------------------------------------------------------------------------------------------------|
| Oil cooler             | On condition (replace when contaminated)                                                            |
| Propeller (Hartzell)   | 1500 hours or 4 years.<br>Reduce to 1000 hours or 3 years if airplane is stored out in the weather. |
| Propeller (McCauley)   | 1500 hours or 3 years                                                                               |
| Propeller controls     | On condition                                                                                        |
| Propeller governor     | At engine overhaul but not to exceed 1500 hours or 3 years                                          |
| Dry air pressure pumps | Every 600 hours                                                                                     |
| All hose               | On condition                                                                                        |

## **FUEL SYSTEM**

|                                 |                                                                                                      |
|---------------------------------|------------------------------------------------------------------------------------------------------|
| Fuel cells                      | On condition                                                                                         |
| Wing fuel quantity transmitters | On condition                                                                                         |
| Fuel cell drain valve           | On condition                                                                                         |
| Fuel system check valves        | On condition                                                                                         |
| Fuel selector valves            | Inspect every 500 hours<br>Overhaul every 1200 hours                                                 |
| Aux fuel pump                   | Every 1200 hours                                                                                     |
| All hose                        | Hose carrying flammable liquids at engine overhaul or every 5 years.<br>All other hose on condition. |
| Vent line check valve           | On condition                                                                                         |

**Section VIII**  
**Handling, Serv - Maint**

**BEEHCRAFT Baron B55**  
**Serial TC2003 and After**

**COMPONENT**                      **OVERHAUL OR REPLACE**

**INSTRUMENTS**

|                                   |                                                                 |
|-----------------------------------|-----------------------------------------------------------------|
| Turn coordinator                  | On condition                                                    |
| Altimeter                         | Every 24 months per FAA<br>Directive (Inspect<br>and Calibrate) |
| Directional gyro                  | On condition                                                    |
| Gyro horizon                      | On condition                                                    |
| Gyro pressure                     | On condition                                                    |
| Engine indicator units            | On condition                                                    |
| Airspeed indicator                | On condition                                                    |
| Rate-of-climb                     | On condition                                                    |
| Fuel flow gage                    | On condition                                                    |
| Manifold pressure indicator       | On condition                                                    |
| Tachometer                        | On condition                                                    |
| Free air temperature<br>indicator | On condition                                                    |
| Deice pressure gage               | On condition                                                    |
| All hose                          | On condition                                                    |

**ELECTRICAL SYSTEM**

|                      |                                                    |
|----------------------|----------------------------------------------------|
| Dynamic brake relay  | On condition                                       |
| Battery master relay | On condition                                       |
| Paralleling relay    | On condition                                       |
| All other relays     | On condition                                       |
| Voltage regulator    | On condition                                       |
| Starter              | At engine over-<br>haul or replace<br>on condition |



**OVERHAUL OR REPLACE**

|                              |                      |
|------------------------------|----------------------|
| Starter relay                | On condition         |
| Alternator or Generator      | On condition         |
| Landing gear selector switch | 1200 hours - replace |

|                            |                                                                                              |
|----------------------------|----------------------------------------------------------------------------------------------|
| Cabin heater               | Every 500 hours of operation with periodic inspections                                       |
| Heater ignition assembly   | Replace every 500 hours of heater operation                                                  |
| Heater spark plug          | On condition                                                                                 |
| Heater fuel pump           | On condition                                                                                 |
| Heater fuel spray nozzle   | Replace at heater overhaul                                                                   |
| Heater fuel shut-off valve | On condition                                                                                 |
| Combustion blower          | On condition                                                                                 |
| Combustion blower brushes  | Every 500 hours                                                                              |
| Heater vent blower         | On condition                                                                                 |
| Heater vent blower brushes | Every 500 hours                                                                              |
| Oxygen regulator           | Every 2000 hours or 48 months                                                                |
| Oxygen cylinder (3HT)      | Hydrostatically test every 3 years, replace every 24 years or 4,380 refills (ICC Regulation) |

| All hose | On condition |
|----------|--------------|
| 100%     | 100%         |
| 95%      | 95%          |
| 90%      | 90%          |
| 85%      | 85%          |
| 80%      | 80%          |
| 75%      | 75%          |
| 70%      | 70%          |
| 65%      | 65%          |
| 60%      | 60%          |
| 55%      | 55%          |
| 50%      | 50%          |
| 45%      | 45%          |
| 40%      | 40%          |
| 35%      | 35%          |
| 30%      | 30%          |
| 25%      | 25%          |
| 20%      | 20%          |
| 15%      | 15%          |
| 10%      | 10%          |
| 5%       | 5%           |
| 0%       | 0%           |

**COMPONENT**

**OVERHAUL OR REPLACE**

**FLAPS AND FLIGHT CONTROLS**

|                       |                  |
|-----------------------|------------------|
| Flight controls       | On condition     |
| Aileron tab actuator  | On condition     |
| Elevator tab actuator | On condition     |
| Rudder tab actuator   | On condition     |
| Flap track rollers    | Every 1000 hours |
| Flap motor and drives | Every 2000 hours |
| Flap actuators        | Every 2000 hours |
| Flap flexible shaft   | Every 2000 hours |

**MISCELLANEOUS**

|                                     |                                                   |
|-------------------------------------|---------------------------------------------------|
| Seat belts or Shoulder<br>Harnesses | Inspect every 12 months,<br>replace on condition  |
| Hand fire extinguisher              | Inspect every 12 months,<br>recharge as necessary |

\*Refer to Continental Service Bulletin M74-20, for detailed overhaul period instructions.

With particular attention to throttle response, smooth power and oil consumption, a qualified certificated mechanic must determine that the engine is operating normally at the time of each periodic inspection.

## **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 Supplemental Data Section IX, of this Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

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# Raytheon Aircraft

## LOG OF SUPPLEMENTS

Beech Baron® 95-B55 & 95-B55A

Pilot's Operating Handbook  
and  
FAA Approved Airplane Flight Manual

P/N 96-590011-17

August, 2002

*FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.*

| PART<br>NUMBER | SUBJECT                                                            | REV<br>NO. | DATE    |
|----------------|--------------------------------------------------------------------|------------|---------|
| 36-590002-47   | Full Flap Warning Horn System                                      |            | 12/90   |
| 36-590002-49   | Landing Gear Warning Light System                                  |            | 12/90   |
| 58-590000-25   | AirData AD611/D Area Navigation Sys-<br>tem                        |            | 6/21/77 |
| 58-590000-27   | AirData AD-511/AD-511G Area Naviga-<br>tion System                 | 1          | 7/79    |
| 58-590000-29   | King KNS-80 Integrated Navigation Sys-<br>tem                      |            | 1/79    |
| 58-590000-49   | Inside Cabin Door Handle with Open/<br>Closed Placard              |            | 12/90   |
| 58-590000-59   | Instrument Air Pressure System Check                               |            | 8/02    |
| 96-590010-19   | King KN-74 Area Navigation System                                  | 1          | 2/79    |
| 96-590010-21   | Nickel-Cadmium Battery and Charge<br>Current Detector              |            | 10/76   |
| 96-590010-27   | Narco Avionics RNAV 161 Multi-Way-<br>point Area Navigation System |            | 1/79    |
| 96-590011-19   | Operation of United Kingdom Registered<br>Aircraft                 | 1          | 10/78   |
| 96-590011-21   | Bendix NP-2041A NAV Computer Pro-<br>grammer                       | 1          | 1/80    |
| 102-590000-45  | King KNC-610 Area Navigation System                                |            | 11/78   |
| 102-590000-53  | King KNS-81 Integrated Navigation Sys-<br>tem                      | 1          | 10/83   |

**Log Of Supplements (Cont'd)**  
**96-590011-17**  
**August, 2002**

| <b>PART<br/>NUMBER</b> | <b>SUBJECT</b>                              | <b>REV<br/>NO.</b> | <b>DATE</b> |
|------------------------|---------------------------------------------|--------------------|-------------|
| 106-590000-15          | Collins ANS-351 Area Navigation Sys-<br>tem |                    | 11/16/77    |
| SA795CE                | Hartzell Propellers                         | 2                  | 2/13/76     |

*NOTE: Supplements applicable to equipment other than that installed may, at the discretion of the owner/operator, be removed from the manual.*

*\* Supplements marked with an asterisk will not be supplied with handbooks sold through Authorized Raytheon Outlets due to their limited applicability. If a document is required for your airplane, please order the document through normal channels.*

**BEECHCRAFT 33, 35, 36, 55, 58 SERIES  
LANDPLANES**

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

**FOR THE**

**FULL FLAP WARNING HORN SYSTEM**

**THIS SUPPLEMENT IS APPLICABLE TO PILOT'S  
OPERATING HANDBOOKS AND FAA APPROVED  
AIRPLANE FLIGHT MANUALS:**

**(SEE NEXT PAGE FOR APPLICABILITY)**

Airplane Serial Number: \_\_\_\_\_

Airplane Registration Number: \_\_\_\_\_

FAA Approved:

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

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**FAA Approved  
P/N 36-590002-47  
Issued: December, 1990**

The supplement noted herein applies to the following Pilot's Operating Handbooks and FAA Approved Airplane Flight Manuals:

|                     |                                                                                                                           |
|---------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>33-590009-13</b> | F33A Serials CE-816 thru CE-1306, except CE-1301<br>F33C Serials CJ-149 thru CJ-179                                       |
| <b>35-590118-29</b> | V35B Serials D-10179 thru D-10403                                                                                         |
| <b>36-590002-17</b> | A36 Serials E-1371 thru E-2110, except E-1946 and E-2104                                                                  |
| <b>36-590002-37</b> | A36 Serials E-1946, E-2104, E-2111 thru E-2467, except E-2458                                                             |
| <b>36-590003-3</b>  | A36TC Serials EA-1 thru EA-272, except EA-242                                                                             |
| <b>36-590006-3</b>  | B36TC Serials EA-242, EA-273 thru EA-388, except EA-320                                                                   |
| <b>36-590006-19</b> | B36TC Serials EA-320, EA-389 thru EA-487                                                                                  |
| <b>96-590011-17</b> | 95B55 Serials TC-2003 thru TC-2456                                                                                        |
| <b>96-590010-29</b> | 95C55 Serials TC-350, TE-1 thru TE-451<br>D55 Serials TE-452 thru TE-767<br>E55 Serials TE-768 thru TE-942, except TE-938 |



|                     |                                                                                            |
|---------------------|--------------------------------------------------------------------------------------------|
| <b>96-590010-31</b> | E55 Serials TE-938, TE-943<br>thru TE-1083                                                 |
| <b>96-590010-17</b> | E55 Serials TE-1084 thru<br>TE-1201                                                        |
| <b>58-590000-31</b> | 58 Serials TH-1 thru TH-772                                                                |
| <b>58-590000-21</b> | 58 Serials TH-773 thru TH-<br>1395, except TH-1389                                         |
| <b>58-590000-35</b> | 58 Serials TH-1389, TH-<br>1396 thru TH-1471, TH-<br>1476, TH-1487, TH-1489,<br>TH-1498    |
| <b>58-590000-39</b> | 58 Serials TH-1472 thru TH-<br>1543, except TH-1476, TH-<br>1487, TH-1489, and TH-<br>1498 |

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### **GENERAL**

The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the Full Flap Warning Horn System in accordance with Beech Kit Drawing 36-3012.

The information in this supplement supersedes or adds to the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only as set forth below. Users of the manual are advised to always refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

### **LIMITATIONS**

No change.

### **EMERGENCY PROCEDURES**

No change.

### **NORMAL PROCEDURES**

No change.

## **PERFORMANCE**

No change.

## **WEIGHT AND BALANCE**

No change.

## **SYSTEMS DESCRIPTION**

### **LANDING GEAR**

#### **WARNING HORN AND (IF INSTALLED BY KIT) GEAR UP ANNUNCIATOR**

With the landing gear retracted and the flaps fully extended, a warning horn will sound intermittently and the GEAR UP annunciator (if installed) will flash.

## **HANDLING, SERVICING, AND MAINTENANCE**

No change.

**BEECHCRAFT 33, 35, 36, 55, 58 SERIES  
LANDPLANES**

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

**FOR THE**

**LANDING GEAR WARNING LIGHT SYSTEM**

**THIS SUPPLEMENT IS APPLICABLE TO PILOT'S  
OPERATING HANDBOOKS AND FAA APPROVED  
AIRPLANE FLIGHT MANUALS:**

**(SEE NEXT PAGE FOR APPLICABILITY)**

Airplane Serial Number: \_\_\_\_\_

Airplane Registration Number: \_\_\_\_\_

FAA Approved:



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

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**FAA Approved  
P/N 36-590002-49  
Issued: December, 1990**

**1 of 6**

The supplement noted herein applies to the following Pilot's Operating Handbooks and FAA Approved Airplane Flight Manuals:

|                     |                                                                                             |
|---------------------|---------------------------------------------------------------------------------------------|
| <b>33-590009-13</b> | F33A Serials CE-748, CE-772 thru CE-1306, except CE-1301<br>F33C Serials CJ-149 thru CJ-179 |
| <b>35-590118-29</b> | V35B Serials D-10097, D-10120 thru D-10403                                                  |
| <b>36-590002-17</b> | A36 Serials E-1111, E-1241 thru E-2110, except E-1946 and E-2104                            |
| <b>36-590002-37</b> | A36 Serials E-1946, E-2104, E-2111 thru E-2467, except E-2458                               |
| <b>36-590003-3</b>  | A36TC Serials EA-1 thru EA-272, except EA-242                                               |
| <b>36-590006-3</b>  | B36TC Serials EA-242, EA-273 thru EA-388, except EA-320                                     |
| <b>36-590006-19</b> | B36TC Serials EA-320, EA-389 thru EA-487                                                    |
| <b>96-590011-17</b> | 95B55 Serials TC-2003 thru TC-2456                                                          |
| <b>96-590010-17</b> | E55 Serials TE-1084 thru TE-1201                                                            |
| <b>58-590000-21</b> | 58 Serials TH-773 thru TH-1395, except TH-1389                                              |

**58-590000-35**

58 Serials TH-1389, TH-1396 thru TH-1471, TH-1476, TH-1487, TH-1489, and TH-1498

**58-590000-39**

58 Serials TH-1472 thru TH-1475, TH-1477 thru TH-1486, TH-1488, TH-1490 thru TH-1497, TH-1499 thru TH-1542, and TH-1544

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### **GENERAL**

The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the Landing Gear Warning Light System in accordance with Beech Kit Drawing 36-3013.

The information in this supplement supersedes or adds to the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only as set forth below. Users of the manual are advised to always refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

### **LIMITATIONS**

#### **KINDS OF OPERATIONS EQUIPMENT LIST**

The required items listed below supersede those items listed under "LANDING GEAR" published in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual:

| <b>SYSTEM<br/>and/or<br/>COMPONENT</b>     | <b>VFR<br/>DAY</b> | <b>VFR<br/>NIGHT</b> | <b>IFR<br/>DAY</b> | <b>IFR<br/>NIGHT</b> | <b>ICING<br/>COND-<br/>ITIONS</b> |
|--------------------------------------------|--------------------|----------------------|--------------------|----------------------|-----------------------------------|
| <b>LANDING GEAR</b>                        |                    |                      |                    |                      |                                   |
| 1. Emergency Landing Gear Extension System | 1                  | 1                    | 1                  | 1                    | 1                                 |
| 2. Landing Gear Position Indicator Lights  | 4                  | 4                    | 4                  | 4                    | 4                                 |
| 3. Landing Gear Motor and Gearbox          | 1                  | 1                    | 1                  | 1                    | 1                                 |
| 4. Landing Gear Warning Horn               | 1                  | 1                    | 1                  | 1                    | 1                                 |
| 5. Gear Up Warning Light                   | 1                  | 1                    | 1                  | 1                    | 1                                 |

## **EMERGENCY PROCEDURES**

No change.

## **NORMAL PROCEDURES**

No change.

## **PERFORMANCE**

No change.

## **WEIGHT AND BALANCE**

No change.

## **SYSTEMS DESCRIPTION**

### **INSTRUMENT PANEL**

### **GEAR-UP WARNING LIGHT SYSTEM**

This kit installs a landing gear warning light (GEAR UP) that flashes whenever the gear warning horn sounds. De-



pending upon the particular airplane in which this kit is installed, the light will be located either; (1) as a part of the Glareshield Annunciator Panel or, (2) as a separate light in the glareshield.

The warning annunciators have both a "bright" and "dim" mode of illumination intensity. On some airplanes, certain annunciators do not dim, eg., START, AFT DOOR. On these airplanes, the GEAR UP light (annunciator) also will not dim.

## **LANDING GEAR SYSTEM**

### **GEAR-UP WARNING LIGHT**

A gear-up warning light is installed which will flash whenever the gear-up warning horn sounds. The light is cancelled as the warning horn cancels.

## **HANDLING, SERVICING, AND MAINTENANCE**

No change.

**BEECHCRAFT BARON MODELS 95-B55, 95-B55A, E55,  
E55A, 58, 58A, 58P, 58PA, 58TC, 58TCA**

**LANDPLANES**

**PILOT'S OPERATING HANDBOOK  
and  
FAA APPROVED AIRPLANE FLIGHT MANUAL  
SUPPLEMENT  
for the**

**AIRDATA AD611/D AREA NAVIGATION**

**GENERAL**

The information in this supplement is FAA-approved material and must be attached to the FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the AirData AD611/D Area Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic FAA Approved Airplane Flight Manual only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

The RNAV function of the AirData AD611/D system performs a vector computation that results in a visual display of the magnetic bearing and distance to or from a selected waypoint. The computer, in effect, moves the selected reference facility (VORTAC or colocated VOR/DME facility) to a different location called a waypoint. The waypoint, which is expressed in terms of nautical miles along a selected radial from the VORTAC, is programmed into the system on the Manual Waypoint Setter.

Steering guidance is presented as a left/right display on the Horizontal Situation Indicator (HSI). The display format differs from the conventional VOR course deviation of  $\pm 10$  degrees called "angular course deviation." Rather, course deviation is presented in nautical miles from the course centerline. This feature, referred to as "linear course deviation", provides for a constant course width irrespective of the distance to the waypoint. Two levels of sensitivity are available for area navigation. The enroute sensitivity, available when the APPR pushbutton on the system's range indicator is not activated, provides a constant course width of  $\pm 5$  nautical miles. Approach sensitivity, available with the APPR pushbutton depressed, provides a constant course width of  $\pm 1.25$  nautical miles. Approach sensitivity should be used when within 10 nautical miles of the terminal waypoint.

## **LIMITATIONS**

1. The area navigation system may not be used as a primary system under IFR conditions except on approved approach procedures, approved airways, and random area navigation routes when approved by Air Traffic Control.
2. This system can only be used with colocated facilities. (VOR and DME signals originate from same geographical location.)

## **EMERGENCY PROCEDURES**

### *CAUTION*

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the enroute mode, check for correct frequency.

2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.
3. If NAV flag appears during an approach, execute published missed approach and utilize another approved facility.

## **NORMAL PROCEDURES**

The AirData AD611/D system is programmed and operated from a Digital Range/Mode Control Unit, and one or more Waypoint Setter Units. Frequency selection and course display are provided by the standard navigation controls and HSI.

## **CONTROLS AND DISPLAYS**

### *DIGITAL RANGE/MODE CONTROL UNIT (RNAV)*

1. RNAV ON-OFF Pushswitch:

Used to activate and deactivate the RNAV system. It is a push ON/push OFF switch that is backlighted whenever it is in the ON state. When ON, it connects the RNAV computer to the HSI. When OFF, the HSI display presents conventional VOR/LOC information.

2. APPR Pushswitch:

Used to activate or deactivate the RNAV approach mode of operation. This operation increases the sensitivity of the HSI presentation and is used when approaching a waypoint in an approach to landing. The switch is backlighted whenever it is switched ON.

3. Digital Display:

Normally indicates the distance to the waypoint in nauti-

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cal miles from present position. The airplane's standard DME distance indicator will continue to display DME distance to the reference VORTAC.

4. BRG Pushbutton:

Used to temporarily cause the digital display to indicate the magnetic bearing from the airplane to the selected waypoint. Valid VOR and DME signals must be received for this function.

5. TEST Pushbutton:

Illuminates the three diagnostic annunciator lights to verify light operation. Temporarily causes the digital display to indicate the waypoint DISTANCE value entered on the active waypoint setter unit. Also, a reference bearing output is sent to the HSI which causes the left/right needle to center when the course selector is set to the RADIAL value entered on the active waypoint setter unit. Depressing both the TEST and BRG buttons simultaneously causes the waypoint RADIAL value entered on the active waypoint setter unit to appear on the digital display.

These tests require at least 10 nautical miles be set into the waypoint DISTANCE and reception of a valid VOR signal.

6. Diagnostic Lights:

Each of the three fault annunciators will flash and the digital display will be blank under the specified conditions.

DTW: Indicates that "distance to waypoint" computation cannot be made. This can be an excessive dis-

tance (over 199.9 NM to waypoint), excessive RADIAL setting (over 359.9 degrees) or a computer malfunction.

VOR: Indicates that computation quality of VOR signal has been lost.

DME: Indicates a loss of DME signal.

### *WAYPOINT SETTER UNIT (RNAV)*

#### 1. RADIAL Thumbwheels:

Set to indicate the bearing from the VOR to the waypoint. The DTW diagnostic annunciator will flash if a RADIAL entry exceeds 359.9 degrees or results in a distance-to-waypoint exceeding 199.9 nautical miles.

#### 2. DISTANCE Thumbwheels:

Set to indicate the distance from the VOR to the waypoint.

#### 3. ACTIVATE Pushbutton:

Depressing white pushbutton, located above the RADIAL thumbwheels, activates that waypoint setter unit, placing its RADIAL and DISTANCE information into the RNAV computer. In systems containing more than one waypoint setter unit, the number 1 is automatically activated when the RNAV ON-OFF switch is selected ON. Any other waypoint setter unit can then be activated by depressing the ACTIVATE pushbutton on the desired waypoint setter unit.

Depressing the ACTIVATE pushbutton also performs a "fast update" function for the RNAV computer each time

it is depressed. Fast update allows current VOR and DME information on aircraft position into the computer without averaging out the errors in these signals. Fast update would be used after channeling a new frequency into the NAV equipment, after regaining DME lock-on, or after changing a thumbwheel setting on an active waypoint setter unit.

#### 4. Waypoint Indicator Light:

Yellow light, located above DISTANCE thumbwheels, illuminates whenever its waypoint setter unit is activated. These lights are numbered when more than one waypoint setter unit is installed.

### PREFLIGHT

The preflight check is to test the computation accuracy of the computer and to assure the proper operation of the controls and displays. This procedure should be completed prior to programming for the intended flight.

1. Depress RNAV pushswitch to ON.
2. Set RADIAL thumbwheels to 000.0 degrees.
3. Set DISTANCE thumbwheels to 25.0 NM.
4. Set NAV 1 receiver to VOR or VORTAC within receiving range.
5. Press and hold TEST button. Adjust course control on HSI to produce centered needle with "TO" indication. Check that:
  - a. Digital display indicates  $25.0 \pm 1$  NM.
  - b. The course setting is  $000 \pm 2$  degrees.

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6. Press and hold BRG and TEST buttons. Check that:
  - a. Digital display indicates  $0 \pm 1$  degree.
7. Release BRG and TEST buttons.

#### NOTE

If any of the preflight tests are not within the prescribed tolerances, the RNAV system will not meet the required standards of accuracy. Corrective adjustments or maintenance is required. This procedure does not test the DME.

### PROGRAMMING

1. Waypoint Definition - Determine in terms of RADIAL and DISTANCE (NM) from a specific VORTAC.

#### NOTE

The maximum allowable RADIAL setting is 359.9 degrees. If a RADIAL of 360.0 degrees is desired, use a value of 000.0 degrees. The maximum allowable DISTANCE setting is 199.9 NM. The maximum allowable range from the airplane to the waypoint is also 199.9 NM. If any of these restrictions are exceeded, select a waypoint that is within these values.

2. Waypoint Setter Unit(s) - SET Thumbwheels (RADIAL & DISTANCE)
3. NAV Receivers (VOR & DME) - ON. Frequency SET.

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4. RNAV ON-OFF Pushswitch - ON (switch illuminated)

#### NOTE

The number 1 waypoint setter unit is automatically selected when the RNAV pushswitch is turned ON.

5. Digital Display - Check to insure that distance to waypoint value appears.
6. HSI Course Control - SET to desired magnetic course.

#### ENROUTE

Using the AirData AD611/D, system enroute corresponds to flying VOR airways, except navigation is now to or from waypoints. The waypoint parameters (radial and distance) in effect "move" the VORTAC. Once this is accomplished, the horizontal situation indicator and AD611/D digital range indicator will provide guidance to the waypoint similar to conventional VOR/DME navigation. The only notable difference is the course deviation needle on the HSI will maintain a constant sensitivity of  $\pm 5$  nautical miles irrespective of the distance to the waypoint. The range indicator will count down to approximately 0.2 nautical mile when, upon reaching the waypoint, the TO flag will change to FROM.

When the next waypoint is required for navigation, depress the ACTIVATE pushbutton on the next waypoint setter unit in sequence, confirm the proper VORTAC frequency is set, and set the desired magnetic course on the horizontal situation indicator.

#### NOTE

If an ILS frequency is selected on NAV 1 while in

an RNAV mode, the NAV flag will appear on the horizontal situation indicator and the VOR diagnostic light will flash. The RNAV must be selected OFF for ILS or conventional VOR operation (except for Approach Range Monitor operation).

## APPROACH

Using the AirData AD611/D system for an approach is similar to making a localizer approach. However, the system is using VOR and DME information and the MDA will be higher than when conducting a precision approach. Insert the waypoint parameters from the approach chart into the waypoint setter units. These parameters must be taken from an approved RNAV approach procedure for IFR operations. Activate the approach mode by depressing the APPR pushswitch. This will increase the horizontal situation indicator navigation sensitivity to a  $\pm 1.25$  nautical miles course width. For smoother operation, the computed distance to the waypoint should not exceed 30 nautical miles while in the approach mode.

Set the appropriate inbound course to each waypoint in turn and depress the ACTIVATE pushbutton on the appropriate waypoint setter unit to establish the next waypoint. If landing cannot be made upon reaching the MAP, follow the missed approach procedure outlined on the approved plate.

## APPROACH RANGE MONITOR

The Approach Range Monitor feature provides for the separation of the RNAV computed range to a waypoint from the steering guidance of the pilot's horizontal situation indicator. Selecting the Approach Range Monitor switch to the RANGE MONITOR position will connect the RNAV com-

puter to the NAV 2 receiver. The pilot's horizontal situation indicator will be retained on the NAV 1 receiver.

On an ILS approach, for example, it is desirable to know distance to the outer marker and then to the runway threshold. By selecting RANGE MONITOR and setting the appropriate NAV 2 frequency and waypoint parameters in the waypoint setter unit, the distance to the desired fix will be continuously displayed while ILS steering guidance on the horizontal situation indicator will be conventional. The result is the ability to fly a localizer or full ILS steering situation while retaining RNAV computed distance to a selected fix.

### *CAUTION*

It is imperative the Approach Range Monitor switch be placed in the NORMAL position during RNAV operations. If left in the RANGE MONITOR position, the range display will be based on the NAV 2 frequency and waypoint setter unit parameters, and the pilots horizontal situation indicator will display conventional VOR steering based on the selected NAV 1 frequency.

**PERFORMANCE** - No change.

Approved:



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**BEECHCRAFT 95-B55, 95-B55A, E55, E55A  
58, 58A, 58P, 58PA, 58TC and 58TCA  
LANDPLANES**

**PILOT'S OPERATING HANDBOOK**

**and**

**FAA APPROVED AIRPLANE FLIGHT MANUAL**

**SUPPLEMENT**

**FOR THE**

**AIRDATA AD-511/AD-511G AREA NAVIGATION SYSTEM**

**GENERAL**

The information in this supplement is FAA-Approved material and must be attached to the FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the AirData AD-511/AD-511G Area Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic FAA-Approved Airplane Flight Manual only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and/or placarding applicable to operation of the airplane.

The RNAV function of the AirData AD-511/AD-511G system performs a vector computation that results in a digital display of the magnetic bearing and range in nautical miles to or from a selected waypoint. On the AD-511G only, groundspeed and time-to-station read-outs also appear

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when the KTS/MIN pushbutton is depressed. The computer, in effect, moves the selected reference facility (colocated VOR/DME facility) to a different location called a waypoint. The waypoint, which is expressed in terms of nautical miles along a selected radial from the reference facility, is programmed with the thumbwheels on the AD-511/AD-511G. RNAV steering can be accomplished by flying the magnetic heading presented in the BEARING digital display or by reference to the CDI/HSI with Steering Adapter (51DSA or 51ASA) installed. Note that the 51ASA provides "angle" steering where full scale needle deflection is  $\pm 10^\circ$  as in VOR tracking, whereas with the 51DSA installed the CDI/HSI displays "linear" needle deflection having full scale needle deflection of  $\pm 5$  NM. If the 51DSA Steering Adapter is installed, there may be a switch located on the airplane panel to select RNAV Enroute/Approach mode of steering. For enroute operations the switch is left in the Enroute position which provides full scale needle deflection of  $\pm 5$  NM. During RNAV instrument approach operations the Approach position offers more sensitive needle deflection of  $\pm 1.25$  NM full scale. The AD-511 is designed to the standard that "OFF is OUT". This means that when the RNAV is OFF, the basic VOR and LOC functions of the navigational system will remain operative.

## LIMITATIONS

1. The area navigation system may not be used as a primary navigational system under IFR conditions except on approved approach procedures, approved airways, and random area navigation routes when approved by Air Traffic Control.
2. This system can only be used with colocated VOR/DME navigational facilities (VOR and DME signals originate from the same geographical location).
3. The Approach mode of the AD-511/AD-511G with the 51DSA Steering Adapter (if installed) shall be limited to

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approach operations with ground speeds under 180 knots at a distance less than 25 nautical miles from the waypoint.

## **EMERGENCY PROCEDURES**

### ***CAUTION***

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the Enroute mode, check for correct navigational frequency.
2. If VOR or DME equipment is intermittent or lost, utilize other navigational equipment as required.
3. If FLAG mode appears during an approach, execute published missed approach and utilize another approved navigational facility or approach procedure.

## **NORMAL PROCEDURES**

The AirData AD-511/AD-511G system is programmed and operated through a central control unit with optional remote steering commands through a CDI/HSI (if installed). Frequency selection is provided by the standard navigational controls.

### **PREFLIGHT**

The preflight check is to test the computation accuracy of the computer and to assure the proper operation of the controls and displays. This procedure should be completed

prior to programming for the intended flight.

1. Depress RNAV ON-OFF pushbutton to ON. The left WPT light should illuminate indicating that the left waypoint is active.
2. Set left WPT RADIAL thumbwheels to 000.0 degrees.
3. Set left WPT DISTANCE thumbwheels to 26.0 NM or less.
4. Set active NAV receiver to appropriate navigational facility (colocated VOR/DME facility) within range.
5. Press and hold TEST pushbutton. If properly calibrated, the BEARING and RANGE NM digital displays should read the active waypoint RADIAL and DISTANCE as dialed into the left waypoint thumbwheels.

#### NOTE

On the CDI/HSI indicator, the left/right needle will center "TO" when the OBS setting is at the value of the RADIAL as entered into the left waypoint thumbwheels.

#### PROGRAMMING

1. Waypoint Definition - DETERMINE in terms of RADIAL and DISTANCE (NM) from a specific reference facility (colocated VOR/DME facility).

#### NOTE

The maximum allowable RADIAL setting is 359.9 degrees. If a RADIAL of 360.0 degrees is desired, use a value of 000.0 degrees. The maximum allowable DISTANCE setting is 199.9

NM. The maximum allowable RANGE NM from the airplane to the waypoint is also 199.9 NM. If any of these restrictions are exceeded, select a waypoint that is within these values.

2. Waypoint - SET active waypoint thumbwheels (RADIAL and DISTANCE).
3. Navigation Receiver (NAV 1) - TUNE and IDENTIFY.
4. RNAV ON-OFF Pushbutton - ON (switch illuminated).

#### NOTE

The No. 1 (left) waypoint is automatically selected when the RNAV is turned ON. The No. 1 WPT light should be illuminated.

5. Digital Displays - CHECK to ensure that magnetic heading (BEARING) and distance (RANGE NM) to the waypoint appear.
6. CDI/HSI - SET to desired magnetic course.

#### ENROUTE

Using the AirData AD-511/AD-511G system enroute corresponds to flying VOR airways, except navigation is now to or from waypoints.

1. Set NAV receiver and AD-511/AD-511G control unit as shown in the PROGRAMMING section for the first two waypoints on the flight plan route.
2. Set the first waypoint.
3. At station passage, select succeeding waypoints.



## NOTE

At station passage, the RANGE NM digital display will count down to approximately 0.2 NM (depending on altitude) and the TO/FROM flag on the CDI/HSI will switch from "TO" to "FROM".

## APPROACH

■ Using the AD-511/AD-511G for an approach is similar to making a localizer approach. However, the system is using VOR and DME information and the MDA will be higher than when conducting a precision approach.

- 1. Set NAV receiver and AD-511/AD-511G control unit as shown in the PROGRAMMING section for the approach.
- 2. Activate the approach mode by selecting the APPR position on the ENR/APPR switch at the Final Approach Fix.

## NOTE

The CDI/HSI needle sensitivity will be increased to  $\pm 1.25$  NM cruise width (.25 NM/DOT) with the 51DSA steering system.

- 3. Set the appropriate inbound course to each waypoint in turn and depress the appropriate WPT pushbutton to activate the desired waypoint.
- 4. If landing cannot be made upon reaching the Missed Approach Point (MAP), execute the missed approach procedure as directed.

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## **RANGE MONITORING**

The Range Monitoring configuration provides for the separation of the RNAV-computed RANGE NM to a waypoint from the steering guidance presented on the CDI/HSI indicator.

Range monitoring can be accomplished by channeling the NAV 1 receiver into the CDI/HSI indicator and selecting RANGE MONITOR on the NAV 1/RANGE MONITOR switch (if installed) or NAV 2 on the DME selector control.

The CDI/HSI will display NAV 1 navigational information and the AD-511 will display BEARING and RANGE NM digital displays to the waypoint as supplied by the NAV 2/DME navigational information.

**PERFORMANCE** - No change.

**WEIGHT AND BALANCE** - No change.

## **SYSTEMS DESCRIPTION**

The AirData AD-511/AD-511G is a basic Area Navigation Computer with two programmable waypoints. The VOR and DME equipment in the airplane provides information to the computer on airplane position relative to the reference facility (colocated VOR/DME facility). The waypoint thumbwheels are used to insert the waypoint parameters (RADIAL and DISTANCE) into the computer. The computer then calculates the magnetic bearing (BEARING digital display) and distance (RANGE NM digital display) from the airplane to the waypoint repeatedly so as to provide continuous steering information to the waypoint. On the AD-511G the computer also calculates ground speed and time-to-waypoint which are displayed in place of BEARING and

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**RANGE NM** when the KTS/MIN pushbutton is depressed. Straight line paths to the waypoints, up to 200 nautical miles distance, can be flown by reference to the BEARING digital display (or CDI/HSI) and RANGE NM digital display. Waypoint data can be precisely dialed into the thumbwheels to 0.1 and 0.1 NM resolution.

## **CONTROLS AND DISPLAYS**

### **1. RNAV ON-OFF Pushbutton:**

Used to activate and deactivate the RNAV system. It is a push ON/push OFF switch that is backlit when it is ON. When ON, it connects the RNAV computer to the CDI/HSI. When OFF, the CDI/HSI display presents conventional VOR/LOC information.

### **2. RADIAL Thumbwheels:**

Set to indicate the radial from the VOR to the waypoint. A FLAG condition will exist if excess RADIAL data is entered.

### **3. DISTANCE Thumbwheels:**

Set to indicate the distance from the VOR to the waypoint. A FLAG condition will exist if the resultant RANGE NM calculation is in excess of 199 NM.

### **4. BEARING Digital Display:**

Normally indicates the magnetic bearing from the airplane to the selected waypoint. Valid VOR and DME signals must be received for this function. When the VOR/DME momentary switch is depressed, the VOR radial from the VOR to the airplane will appear in the BEARING Digital Display. On the AD-511G, when the KTS/MIN pushbutton is depressed the airplane ground speed will appear in the BEARING Digital Display.

### **5. RANGE NM Digital Display:**

Normally indicates the distance in nautical miles to the waypoint from the present position. The airplane's DME distance indicator will continue to display the

DME distance to the reference facility. When the VOR/DME momentary switch is depressed, the distance in nautical miles from the airplane to the reference facility will appear in the RANGE NM Digital Display. On the AD-511G, when the KTS/MIN pushbutton is depressed the Time-To Waypoint read-out will appear in the RANGE NM Digital Display.

6. TEST Pushbutton:

When depressed, proper calibration of the RNAV circuits may be checked. If the computer is properly calibrated, the BEARING and RANGE NM digital displays should read the active waypoint RADIAL and DISTANCE as dialed into the active waypoint thumbwheels. Also the CDI/HSI left/right needle will center "TO" when the OBS setting is at the value of the RADIAL entered into the active waypoint thumbwheels.

7. VOR/DME Pushbutton:

When depressed, the VOR radial from the reference facility to the airplane will appear in the BEARING digital display. The distance in nautical miles from the airplane to the reference facility will appear in the RANGE NM digital display.

8. Waypoint (WPT) Pushbuttons:

When the RNAV unit is turned ON, the No. 1 (left) WPT light will always illuminate first. This means that waypoint data on the left side thumbwheels is active. Depressing the No. 2 (right) WPT pushbutton causes the No. 2 (right) WPT light to illuminate and activates the right side thumbwheel data.

9. NAV 1/NAV 2 RNAV Select Switch (if installed):

Used to select VOR receiver No. 1 or No. 2 as the data source for the RNAV.

10. Enroute/Approach Switch (ENR/APPR) (if installed):

Installations having the 51DSA Steering Adapter installed may also have an RNAV Enroute/Approach switch located on the airplane instrument panel. This switch changes the RNAV steering full scale needle

sensitivity from  $\pm 5$  NM for Enroute to  $\pm 1.25$  NM for RNAV Approach operations. This switch is generally left in the Enroute position for all flight operations unless flying an RNAV instrument approach. At this time the switch can be placed in the Approach position for more sensitive steering.

**HANDLING, SERVICING AND MAINTENANCE - No change.**

Approved:

*For*   
W. H. Schultz  
Beech Aircraft Corporation  
DOA CE-2

**BEECHCRAFT BARON 95-B55, 95-B55A,  
E55, E55A, 58, 58A, 58P, 58PA, 58TC and  
58TCA  
LANDPLANES**

**PILOT'S OPERATING HANDBOOK AND FAA APPROVED  
AIRPLANE FLIGHT MANUAL SUPPLEMENT  
for the  
KING KNS-80 INTEGRATED NAVIGATION SYSTEM**

**GENERAL**

The information in this supplement is FAA-approved material and must be attached to the FAA Approved Airplane Flight manual when the airplane has been modified by installation of the King KNS-80 Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic FAA Approved Airplane Flight Manual only as set forth within this document. Users of this manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

**LIMITATIONS**

1. The Area Navigation mode may not be used as a primary system under IFR conditions except on approved approach procedures, approved airways, and random area navigation routes when approved by Air Traffic Control.
2. The Area Navigation mode can only be used with colocated facilities (VOR and DME signals originate from the same geographical location).
3. VOR or VOR-PAR modes must be selected when flying directly to or from a VORTAC facility.

## **EMERGENCY PROCEDURES**

### ***CAUTION***

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the Area Navigation mode, check for correct frequency.
2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.
3. If NAV flag appears during an approach, execute published missed approach and utilize another approved facility.

## **NORMAL PROCEDURES**

### **PREFLIGHT**

#### ***AREA NAVIGATION FUNCTIONAL TEST***

The following procedure applies only to airports equipped with, or in range of, a colocated VOR/DME station.

1. Place the KNS-80 in VOR mode.
2. Find and record the angle to the VOR station by centering the D-Bar with a TO TO/FROM flag.
3. Program a waypoint radial angle 120° greater than the indicated VOR radial.

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4. Program a waypoint distance equal to the indicated DME value.

5. Place the KNS-80 in RNAV ENR.

6. Rotate the OBS until the D-Bar centers with a TO flag.

The KNS-80 distance-to-station should now read a value equal to the DME distance ( $\pm .5\text{NM}$ ) and the indicated selected course should read  $60^\circ$  greater than the recorded VOR angle to station.

### *PROGRAMMING*

Pertinent information (waypoint number, station frequency, waypoint bearing, and waypoint distance) for up to four waypoints is entered into the memory from the control unit. Programming may be completed prior to takeoff or during the flight. Any combination of navigational facilities (RNAV waypoint, VOR/DME, ILS) may be loaded into the computer; however, it is desirable that each facility be numbered and loaded in the sequence it is to be used.

### *RNAV WAYPOINTS*

1. Turn the system on by rotating the ON/OFF switch clockwise.

2. Put waypoint 1 in the DSP window by depressing the DSP button. Push button as many times as necessary to go through the 1-2-3-4-1 sequence to reach "1".

3. Select the waypoint 1 frequency using the data input controls which are the two concentric knobs on the right.

4. Select the waypoint 1 radial by depressing the DATA button. This will cause the radial for the previous waypoint 1

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to appear over the annunciation RAD. Select the new radial with the data input controls.

5. Select the waypoint 1 distance by again depressing the DATA button. This will cause the distance for the previous waypoint 1 to appear over the annunciation DST. Select the new distance with the data input controls.

6. This completes the programming for the first waypoint. Follow these procedures for all selected waypoints up to a maximum of four.

### *CONVENTIONAL VOR*

The programming technique for conventional navigation directly toward or away from a VOR facility without a colocated DME is similar to that for RNAV waypoints. Inputting the waypoint number and frequency into the memory is accomplished in the same manner. Since the station has no DME, it cannot be electronically "moved" to a new location (waypoint). Therefore, no values are programmed in the RAD or DST displays.

### *ILS APPROACH (Front course and Back course)*

Programming an ILS approach is accomplished in the same manner as programming conventional VOR.

### *MISSED APPROACH*

If the published missed approach utilizes an RNAV waypoint or VOR facility, it may be entered into the memory any time prior to the approach. This is accomplished in the same manner set forth in CONVENTIONAL VOR and RNAV WAYPOINTS in this section.

## INFLIGHT

Preset waypoints may be recalled from memory and put into active use as required.

1. Press the DSP button as required to select the desired waypoint. The preset waypoint frequency will replace the active waypoint frequency on the display. The selected waypoint number will appear (blinking) over the DSP annunciation. This blinking display is to indicate that the frequency displayed is other than the active waypoint. The waypoint radial and distance may also be checked at this time by pressing the DSP button for each.

2. Verify that the data is correct.

### NOTE

Revisions to the waypoint data can be programmed at this time by entering the new waypoint parameters.

3. When navigation to the displayed waypoint is desired, press the USE button. The waypoint number will appear above the USE annunciation on the display board and the number above the DSP annunciation will cease blinking. The new waypoint frequency will automatically appear.

### NOTE

When "Time To Station" indicates "0" actual time may be anything from 0 to 59 seconds.

## *RNAV OPERATION*

If the system is receiving valid signals from a colocated VOR-LOC facility, it will supply linear deviation information to the Horizontal Situation Indicator (or Course Deviation Indicator). Enroute (RNV ENR) sensitivity, available by pressing the RNAV button, provides a constant course width of  $\pm 5$  NM. Approach (RNV APR) sensitivity, available by pushing the RNAV button again, provides a constant course width of  $\pm 1\frac{1}{4}$  NM. Approach sensitivity should be used when within 10 miles of the terminal waypoint. Time and distance to the waypoint, and computed groundspeed are displayed at the top of the display panel.

## *CONVENTIONAL VOR OPERATION*

VOR or VOR-PAR modes are selected by pressing the VOR button; once for VOR and a second time for VOR-PAR. In VOR mode DME is automatically tuned, and distance, groundspeed and time-to-station to the VORTAC station will be displayed upon lock-on. The HSI (CDI) will display conventional angular crosstrack deviation from the selected course ( $\pm 10^\circ$  full scale). In VOR-PAR mode operation is identical to VOR except the HSI (CDI) will display crosstrack deviation of  $\pm 5$  NM full scale from the selected course. Course width will be constant irrespective of distance from the VORTAC.

## *ILS OPERATION*

The ILS mode is annunciated whenever an ILS frequency is put "in use". LOC/GS functions are annunciated by the LOC and GS flags in the HSI (CDI). Only angular deviation is provided in the ILS mode.

## *DME HOLD OPERATION*

The DME Hold (HLD) function inhibits changing the DME

receiver frequency. Pressing the HOLD button and then selecting a new waypoint forces the KNS-80 into either a conventional VOR or ILS mode of operation according to the newly selected frequency.

Engage DME HOLD as follows:

1. Press the HOLD button.
2. Select the new frequency using the data input controls. HLD will now annunciate. Distance will continue to be read to the VORTAC and information to the HSI (CDI) will be from the newly selected station.

### *RNAV APPROACH*

The RNAV Approach (RNV-APR) mode may be used for runway location (by placing a waypoint at the approach end of the runway) during an approach to an airport. Press the RNAV button to select RNV-APR. In RNV-APR the deviation needle on the HSI (CDI) will display crosstrack deviation of  $\pm 1\frac{1}{4}$  NM full scale. All other aspects of the RNV-APR mode are identical to the RNV-ENR mode.

**PERFORMANCE** - No change

**WEIGHT AND BALANCE** - No change

### **SYSTEMS DESCRIPTION**

The King KNS-80 is an integrated navigation system combining a 200 channel VOR/Localizer receiver, a 40 channel glideslope receiver, a 200 channel DME, and a digital RNAV computer with a capability for preselection and

storage of 4 VOR/LOC frequencies and RNAV waypoint parameters.

The KNS-80 can be operated in any one of three basic modes: VOR, RNAV, or ILS. To change from one mode to another the appropriate pushbutton switch is pressed, except that the ILS mode is entered automatically whenever an ILS frequency is channeled in the USE waypoint. The display will annunciate the mode by lighting a message above the pushbutton. In addition to the standard VOR and RNAV enroute (RNV ENR) modes, the KNS-80 has a constant course width or parallel VOR mode (VOR-PAR) and an RNAV approach mode (RNV APR). To place the unit in either of these secondary modes, the VOR pushbutton or the RNAV pushbutton, as the case may be, is pushed a second time. Repetitive pushing of the VOR button will cause the system to alternate between the VOR and VOR-PAR modes, while repetitive pushing of the RNAV button causes the system to alternate between RNV ENR and RNV APR modes.

All waypoint information, station frequency, waypoint distance, and waypoint radial are entered with the increment/decrement rotary switch on the right side of the panel and displayed in the right hand readout. The small knob affects the lower significant digits while the large knob changes the most significant digits. The tenth's position of waypoint radial and distance can be changed by pulling the small knob to the out position. The type of data being displayed is indicated by the illuminated messages (FRQ, RAD, DST) located directly below the displayed data. Frequency, radial, or distance information for a waypoint can be displayed sequentially by pressing the "DATA" pushbutton. The increment/decrement switch changes only the information being displayed.

The KNS-80 can store frequency, radial, and distance information for up to four waypoints. The waypoint number of

the data being displayed is located above the message DSP. The DSP waypoint number is changed by pressing the DSP button. The number of the waypoint being used for navigation is indicated by the number above the message USE. If the waypoint in use is different from the displayed waypoint, the DSP waypoint number blinks. Pressing the USE button causes the waypoint in use to match the displayed waypoint.

Normally, the DME is tuned to the station paired with the VOR frequency. The tuning of the DME may be frozen by depressing the HOLD button. Subsequent rechanneling of the NAV receiver will cause the HLD light to illuminate. The DME will "hold" the frequency it was tuned to at the time the button was depressed.

## *DISPLAYS*

### 1. NM Display

#### a. VOR and VOR-PAR modes

Displays DME distance in 0.1 NM increments from 0 to 99.9 NM and in 1 NM increments from 100 to 200 NM. Displays dashes whenever DME goes into search.

#### b. RNV APR and RNV ENR modes

Displays RNAV distance to waypoint in 0.1 NM increments from 0 to 99.9 NM and in 1 NM increments from 100 to 400 NM. Displays dashes if DME is in search, if VOR flags, or if the VOR is rechanneled with the HOLD button depressed.

## 2. KT Display

### a. VOR and VOR-PAR modes

Displays ground speed to the DME ground station in 1 knot increments from 0 to 999 knots. Displays dashes whenever DME goes into search.

### b. RNV APR and RNV ENR modes

Displays ground speed to the active waypoint in increments of 1 knot from 0 to 999 knots. Displays dashes whenever DME goes into search, if VOR flags or if the VOR is rechanneled with the HOLD button depressed.

## 3. MIN Display

### a. VOR and VOR-PAR modes

Displays time to DME ground station in 1 minute increments from 0 to 99 minutes. Displays dashes whenever DME goes into search or when calculated time exceeds 99 minutes.

### b. RNV APR and RNV ENR modes

Displays time to the active waypoint in 1 minute increments from 0 to 99 minutes. Displays dashes if DME is in search, if VOR flags, if the VOR is rechanneled with the HOLD button depressed, or if calculated time exceeds 99 minutes.

## 4. FRQ, RAD, DST Display

### a. FRQ mode

Displays frequency from 108.00 to 117.95 MHz in

increments of .05 MHz. Least significant digit displays only zero or five.

b. RAD mode

Displays ground station radial on which waypoint is located from 0.0 to 359.9 degrees.

c. DST mode

Displays the offset distance of the waypoint from the ground station over a range of 0.0 to 199.9 NM.

5. USE Display

Displays waypoint number of data (1 to 4) actually being used by the system. In VOR modes only the frequency has meaning. When changed, always takes on DSP value.

6. DSP Display

Displays waypoint number (1 to 4) of data being displayed.

7. PAR, VOR, ENR, APR, RNV Displays

System status lights.

8. HLD Display

Indicates when the station to which the DME is actually tuned is different that the station to which the VOR is tuned.

9. DATA Display

Displays waypoint data. The messages FRQ, DST, and



RAD tell what is being displayed at any one time.

## 10. ILS Display

Indicates that the frequency in use is an ILS frequency.

## CONTROL

### 1. VOR Button

Momentary pushbutton which, when pushed while the system is in either RNV mode, causes the system to go to VOR mode. Otherwise, the button causes the system to toggle between VOR and VOR-PAR modes.

### 2. RNAV Button

Momentary pushbutton which, when pushed while the system is in either VOR mode, causes the system to go to RNV ENR mode. Otherwise the button causes the system to toggle between RNV ENR and RNV APR modes.

### 3. HOLD Button

Two position pushbutton which, when in the depressed position, inhibits DME from channeling to a new station when the VOR frequency is changed. Pushing the button again releases the button and channels the DME to the station paired with the VOR station.

### 4. USE Button

Momentary pushbutton which, when pressed, causes the active waypoint to take on the same value as the displayed waypoint and the DATA display to go to FRQ mode.

5. DSP Button

Momentary pushbutton which, when pushed, causes displayed waypoint to increment by 1 and DATA display to go to FREQUENCY mode.

6. DATA Button

Momentary pushbutton which, when pressed, causes waypoint DATA display to change from FRQ to RAD to DST and back to FRQ.

7. OFF/PULL ID Control

Rotary switch/potentiometer which, when turned clockwise, applies power to the KNS-80 and increases audio level. Turned counterclockwise it will decrease audio level and switch off power. The switch may be pulled out to hear VOR ident.

8. DATA INPUT Control

Dual concentric knobs with the center knob having an "in" and "out" position.

a. Frequency Data

The outer knob varies the 1MHz digit and the center knob varies the frequency in .05 MHz increments regardless of whether the switch is in its "in" or "out" position.

b. Radial Data

The outer knob varies the 10 degree digit with a carryover occurring from the tens to hundreds position. The center knob in the "in" position varies

the 1 degree digit and in the "out" position varies the 0.1 degree digit.

c. Distance Data

The outer knob varies the 10 NM digit with a carryover occurring from the tens to hundreds place. The center knob in the "in" position varies the 1 NM digit and in the "out" position varies the 0.1 NM digit.

## HANDLING SERVICE AND MAINTENANCE

### BATTERY REPLACEMENT

The waypoint memory is powered by two silver oxide watch cells located in the lower left hand corner of the front panel. Typical life of the cells is two years although high temperature and humidity conditions can shorten this period. If the batteries should become weak, waypoint storage will be lost and the radio will "wake up" tuned to 110.00 MHz in the VOR mode. The cells can be replaced by opening the battery pocket with a thin blade screwdriver. The holder was designed so that the cells can only be inserted with the correct polarity.

APPROVED:



For

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

**BEECHCRAFT SERIES 33,35,36,55,58**

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

**FOR**

**INSIDE CABIN DOOR HANDLE WITH OPEN/  
CLOSED PLACARD**

**THIS SUPPLEMENT IS APPLICABLE TO PILOT'S  
OPERATING HANDBOOKS AND FAA APPROVED  
AIRPLANE FLIGHT MANUALS:**

**(SEE NEXT PAGE FOR APPLICABILITY)**

Airplane Serial Number: \_\_\_\_\_

Airplane Registration Number: \_\_\_\_\_

FAA Approved:



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

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**FAA Approved  
P/N 58-590000-49  
Issued: December, 1990**

**1 of 7**

This supplement applies to the following Pilot's Operating Handbooks and FAA Approved Airplane Flight Manuals:

| MODEL               | PART NUMBER   | A/C SERIALS                              |
|---------------------|---------------|------------------------------------------|
| 35-B33              | 33-590000-17B | All                                      |
| 35-C33, E33, F33    | 33-590002-9B  | All                                      |
| 35-C33A, E33A, E33C | 33-590003-7B  | All                                      |
| F33A, F33C          | 33-590009-13  | CE-674 & after, CJ-129 & after           |
| F33A, F33C          | 33-590009-15  | CE-290 thru CE-673, CJ-26 thru CJ-128    |
| G33                 | 33-590027-3   | All                                      |
| F35                 | 35-590071-13  | All                                      |
| G35                 | 35-590072-9   | All                                      |
| H35                 | 35-590073-15  | All                                      |
| N35, P35            | 35-590094-7   | All                                      |
| S35-TC              | 35-590110-3   | All                                      |
| S35                 | 35-590110-11B | All                                      |
| V35-TC              | 35-590113-3   | All                                      |
| V35A-TC             | 35-590116-3   | All                                      |
| V35B-TC             | 35-590118-23  | D-9069 thru D-9947                       |
| V35B                | 35-590118-29  | D-9948 & after                           |
| V35, V35A, V35B     | 35-590118-31B | D-7977 thru D-9947                       |
| A36                 | 36-590002-17  | E-927 thru E-2110 except E-1946 & E-2104 |
| 36, A36             | 36-590002-19C | E-1 thru E-926                           |
| A36                 | 36-590002-37  | E-1946, E-2104, E-2111 & after           |
| A36-TC              | 36-590003-3   | EA-1 thru EA-272 except EA-242           |

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Issued: December, 1990

| MODEL                                       | PART NUMBER   | A/C SERIALS                                                                  |
|---------------------------------------------|---------------|------------------------------------------------------------------------------|
| B36-TC                                      | 36-590006-3   | EA-242, EA-273<br>thru EA-388                                                |
| B36-TC                                      | 36-590006-19  | except EA-326<br>EA-326, EA-389 &<br>after                                   |
| 95-B55B                                     | 55-590000-49  | All                                                                          |
| 95-55, 95-A55                               | 55-590000-65B | TC-1 thru TC-501<br>except TC-350 &<br>TC-371                                |
| 58, 58A                                     | 58-590000-21  | TH-773 thru TH-<br>1395 except TH-<br>1389                                   |
| 58, 58A                                     | 58-590000-31B | TH-1 thru TH-772                                                             |
| 58, 58A                                     | 58-590000-35  | TH-1389, TH-1396<br>thru TH-1471, TH-<br>1476, TH-1487, TH-<br>1489, TH-1498 |
| 58, 58A                                     | 58-590000-39  | TH-1472 & after,<br>except TH-1476,<br>TH-1487, TH-1489,<br>TH-1498          |
| E55, E55A                                   | 96-590010-17  | TE-1084 & after                                                              |
| 95-C55, 95-C55A,<br>D55, D55A, E55,<br>E55A | 96-590010-29B | TC-350, TE-1 thru<br>TE-942, except<br>TE-938                                |
| E55, E55A                                   | 96-590010-31  | TE-938, TE-943<br>thru TE-1083                                               |
| E55, E55A                                   | 96-590010-37  | TE-1197 only                                                                 |
| 95-B55, 95-B55A                             | 96-590011-17  | TC-2003 & after                                                              |
| 95-B55, 95-B55A                             | 96-590011-23  | TC-1608 thru TC-<br>2002                                                     |
| 95-B55, 95-B55A                             | 96-590011-25  | TC-371, TC-502<br>thru TC-1607                                               |
| 58TC                                        | 106-590000-5  | TK-1 thru TK-84                                                              |
| 58TC, 58TCA                                 | 106-590000-19 | TK-85 thru TK-150,<br>except TK-147                                          |

| <b>MODEL</b> | <b>PART NUMBER</b> | <b>A/C SERIALS</b>        |
|--------------|--------------------|---------------------------|
| 58TC, 58TCA  | 106-590000-21      | TK-147, TK-151 &<br>after |

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### GENERAL

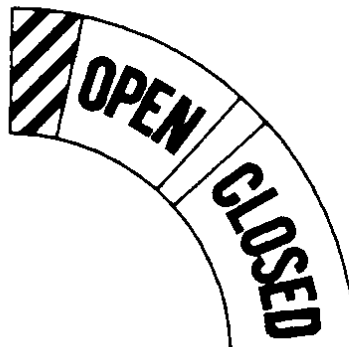
The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the Inside Cabin Door Handle With Open/Closed Placard in accordance with Beech Kit 35-5050.

The information in this supplement supersedes or adds to the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only as set forth below. Users of the manual are advised to always refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

### LIMITATIONS

#### PLACARDS

*On inside of Cabin Door Adjacent to Door Handle:*





## **EMERGENCY PROCEDURES**

No change.

## **NORMAL PROCEDURES**

### **BEFORE TAKEOFF**

All procedures specified in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for the particular airplane shall be completed. In addition, accomplish the following:

- Doors and Windows - SECURE (Check cabin door lock indicator - CLOSED)

## **PERFORMANCE**

No change.

## **WEIGHT AND BALANCE**

No change.

## **SYSTEMS DESCRIPTION**

### **DOORS, WINDOWS AND EXITS**

#### *CABIN DOOR*

The airplane has a conventional cabin door on the forward right side of the fuselage and when closed, the outside cabin door handle is spring loaded to fit into a recess in the door to create a flat aerodynamically clean surface. The door may be locked with a key. To open the door from the outside, lift the handle from its recess and pull until the door opens.

To close the cabin door from the inside, observe that the door handle is in the open position. In this position, the latch handle is free to move approximately one inch in either direction before engagement of the locking mechanism. Then grasp the door and firmly pull the door closed. Rotate the door handle fully counterclockwise into the locked position. Observe that the door handle indicator is in the CLOSED position. When the door is properly locked, the door latch handle is free to move approximately one inch in either direction.

### **NOTE**

When checking the door latch handle, do not move it far enough to engage the door latch release mechanism.

Press firmly outward at the top rear corner of the door. If any movement of the door is detected, completely open the door and close again following the above instructions.

To open the door from the inside, depress the lock button and rotate the handle clockwise.

## **HANDLING, SERVICING, AND MAINTENANCE**

No change.

# **Raytheon Aircraft**

**Beech Models 58/58A (TH-1 and After),  
58P/58PA (TJ-3 thru TJ-497), 58TC/58TCA (TK-1 thru  
TK-151), 95-B55 (TC-2003 thru TC-2456), D55 & E55  
(TE-452 thru TE-1201), 76 (ME-1 thru ME-437)**

## **Pilot's Operating Handbook and FAA Approved Airplane Flight Manual Supplement**

**for the  
Instrument Air Pressure System Check**

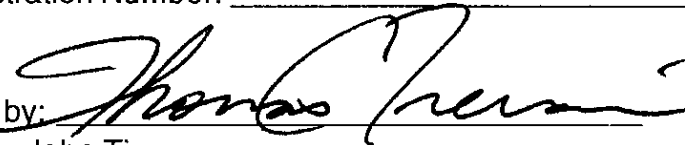
*This Supplement is Applicable to the Following  
Manual(s):*

*58-590000-21, 58-590000-31, 58-590000-35, 58-590000-39,  
102-590000-13, 102-590000-31, 102-590000-41,  
102-590000-57, 106-590000-5, 106-590000-19,  
106-590000-21, 96-590011-17, 96-590010-17,  
96-590010-29, 96-590010-31, 96-590010-37, 105-590000-5*

Airplane Serial Number: \_\_\_\_\_

Airplane Registration Number: \_\_\_\_\_

FAA Approved by: \_\_\_\_\_

*for*   
John Tighe  
Raytheon Aircraft Company  
DOA-230339-CE

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**Issued: August, 2002  
P/N 58-590000-59**

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# Raytheon Aircraft

## LOG OF REVISIONS

Beech Models 58/58A (TH-1 and After),  
58P/58PA (TJ-3 thru TJ-497), 58TC/58TCA (TK-1 thru  
TK-151), 95-B55 (TC-2003 thru TC-2456), D55 & E55  
(TE-452 thru TE-1201), 76 (ME-1 thru ME-437)

### Pilot's Operating Handbook and FAA Approved Airplane Flight Manual Supplement

for the  
Instrument Air Pressure System Check

| REV NO. | PAGE NO(S). | DESCRIPTION    | DATE OF REV  | FAA APPROVED                                                                         |
|---------|-------------|----------------|--------------|--------------------------------------------------------------------------------------|
| 0       | 1 thru 10   | Original Issue | August, 2002 |  |
|         |             |                |              |                                                                                      |
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## SECTION I - GENERAL

The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (POH/AFM).

The information in this supplement supersedes or adds to the basic POH/AFM only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

## SECTION II - LIMITATIONS

No Change

## SECTION III - EMERGENCY PROCEDURES

No Change

## SECTION IV - NORMAL PROCEDURES

### ENGINE STARTING

Add the following procedure to the existing STARTING procedures.

#### **WARNING**

Failure to accomplish this check may allow a failed instrument air pressure system check valve to go undetected. This undetected failure may result in a complete loss of pressure upon failure of the pressure pump on the same side. Flight in Instrument Meteorological Conditions (IMC) or at night must be avoided if the following check is not successfully completed.

#### 1. Instrument Air Pressure System - CHECK

*After first engine is started and before second engine is started:*

- a. Throttle - 1000 RPM or HIGHER
- b. Gyro Pressure/Instrument Air Gage - CHECK
  - 1) Gage Indication - WITHIN THE GREEN ARC
  - 2) Source Failure Indicator For Operating Engine - RETRACTED
  - 3) Source Failure Indicator For Inoperative Engine - EXTENDED

*After second engine is started:*

- a. Throttle - 1000 RPM or HIGHER
- b. Gyro Pressure/Instrument Air Gage - CHECK
  - Source Failure Indicator For Second Engine - RETRACTED

## **SHUTDOWN**

Add the following procedure to the existing SHUTDOWN procedure.

### **WARNING**

Failure to accomplish this check may allow a failed instrument air pressure system check valve to go undetected. This undetected failure may result in a complete loss of pressure upon failure of the pressure pump on the same side. Subsequent flight in Instrument Meteorological Conditions (IMC) or at night must be avoided if the following check is not successfully completed.

1. Instrument Air Pressure System - CHECK
  - a. Engine That Was Started First - SHUTDOWN USING PUBLISHED PROCEDURES
  - b. Throttle, Operating Engine - 1000 RPM or HIGHER
  - c. Gyro Pressure/Instrument Air Gage - CHECK
    - 1) Gage Indication - WITHIN THE GREEN ARC
    - 2) Source Failure Indicator For Operating Engine - RETRACTED
    - 3) Source Failure Indicator For Shut Down Engine - EXTENDED

## **SECTION V - PERFORMANCE**

No Change

## **SECTION VI - WT & BAL/EQUIPMENT LIST**

No Change

## SECTION VII- SYSTEMS DESCRIPTION

### INSTRUMENT AIR PRESSURE SYSTEM

The following information supplements any similar data found in the basic manual.

Regulated, filtered air from each engine-driven pump feeds a combination manifold/check valve. The check valve for each pressure source prevents the loss of pressure through an inoperative pump in the event of a pump failure. The procedures in this supplement are designed to detect the failure of either of these valves. If a failed check valve goes undetected, and the pressure pump on the same side subsequently fails, the pressure from the opposite pump will escape through the failed check valve and then through the failed pump. This can result in a partial or total loss of system pressure and render all pressure-operated systems inoperative.

By performing the Engine Starting and Shut Down Instrument Air Pressure System checks described in this supplement, a failed check valve will be detected. The following example illustrates how to interpret possible results.

#### *ENGINE STARTING INSTRUMENT AIR PRESSURE SYSTEM CHECK*

*Assume the right engine is started first:*

1. If the Gyro Pressure/Instrument Air Gage reads zero and both source failure indicators are extended, then either the right pump is inoperative or the left check valve has failed, allowing the pressure from the right pump to escape.
2. If the Gyro Pressure/Instrument Air Gage reads low and both source failure indicators are retracted, then the left check valve has failed, allowing pressure from the right pump to escape and partially pressurize the left side.



3. If the Gyro Pressure/Instrument Air Gage reads normal, with the right source failure indicator retracted and the left source failure indicator extended, then the left check valve is good; however, the right check valve may, or may not be good. Its condition will be checked during the shutdown Instrument Air Pressure System check.

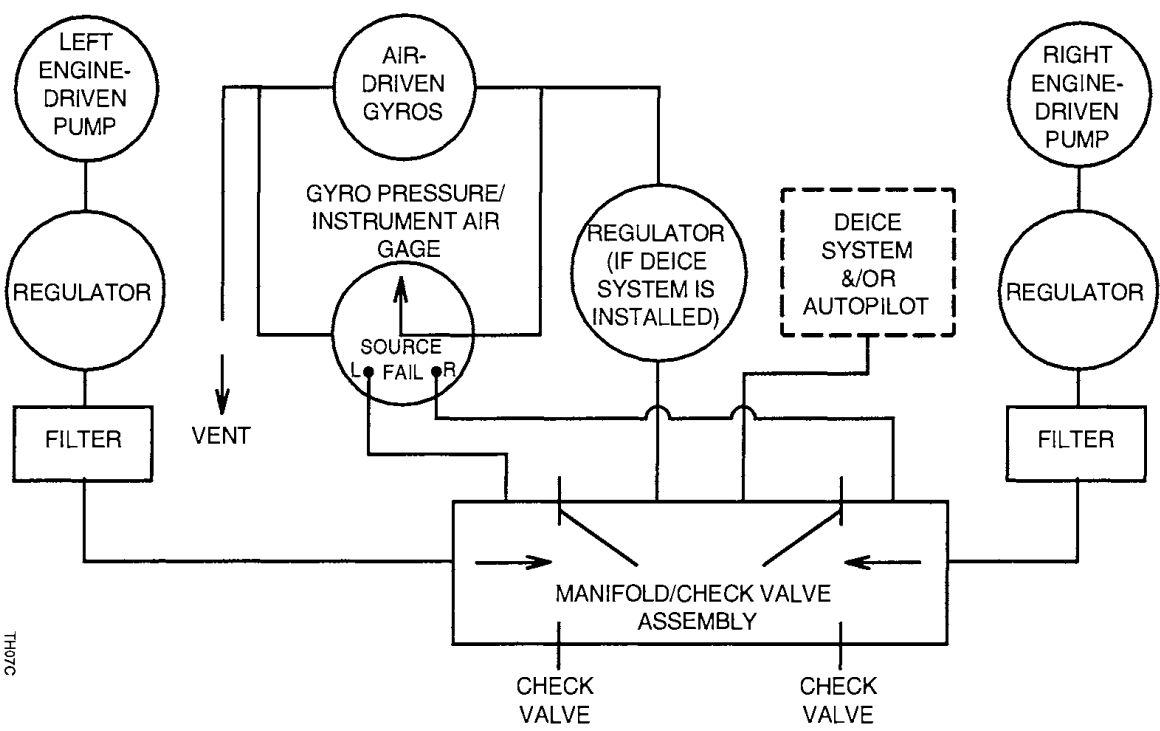
## ***SHUTDOWN INSTRUMENT AIR PRESSURE SYSTEM CHECK***

*Upon running the Shutdown check, the right engine will be shut down first since it was started first:*

1. If the Gyro Pressure/Instrument Air Gage reads zero and both source failure indicators are extended, then either the left pump is inoperative or the right check valve has failed, allowing the pressure from the left pump to escape.
2. If the Gyro Pressure/Instrument Air Gage reads low and both source failure indicators are retracted, then the right check valve has failed, allowing pressure from the left pump to escape and partially pressurize the right side.
3. If the Gyro Pressure/Instrument Air Gage reads normal, with the left source failure indicator retracted and the right source failure indicator extended, then the right check valve is good; however, the left check valve may, or may not be good.

Thus, by accomplishing the checks recommended in this supplement, both check valves are checked during the course of every flight, making it highly unlikely that an instrument air pump failure will result in the complete loss of pressure operated system functions during any single flight.

The following schematic is a simplified representation of the instrument air pressure system.



TH07C  
022838AA, AI

# INSTRUMENT AIR PRESSURE SYSTEM SCHEMATIC

## **SECTION VIII - HANDLING, SERV & MAINT**

No Change

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**BEECHCRAFT BARONS 95-B55,  
95-B55A, E55, E55A, 58, 58A LANDPLANES**

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

for the

**KING KN-74  
AREA NAVIGATION SYSTEM**

**GENERAL**

The information in this supplement is FAA approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the airplane is equipped with a King KN-74 Area Navigation System which has been installed in accordance with BEECHCRAFT FAA approved data.

The information in this supplement supersedes or adds to the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only as set forth below.

**LIMITATIONS**

1. This system shall not be used as a primary system under IFR conditions except on approved approach procedures, approved area navigation airways, and random area navigation routes when approved by Air Traffic Control..

2. This system is to be used only with colocated facilities (VOR and DME signals originate from the same geographical location).

## **EMERGENCY PROCEDURES**

### *CAUTION*

DME may unlock due to loss of signal with certain combinations of distance from station, altitude, and angle of bank.

1. VOR or Distance flag appears while in RNAV mode:
  - a. Selected Frequency - CHECK FOR CORRECT FREQUENCY
  - b. VOR or Distance Flag Intermittent or Lost - UTILIZE OTHER NAV EQUIPMENT AS REQUIRED
2. VOR or Distance flag appears while in APPR mode:
  - a. If flag appears while in an approach, execute published missed approach and utilize other approved facility.

## **NORMAL PROCEDURES**

1. VHF NAV - ON
2. DME - ON
3. Mode Selector - SELECT VOR/DME, RNAV, or APPR
4. NAV Frequency - SET
5. DME Frequency - SET
6. Waypoint Bearing - SET WAYPOINT RADIAL FROM VORTAC
7. Waypoint Distance - SET WAYPOINT DISTANCE FROM VORTAC
8. OBS Control - DESIRED MAGNETIC HEADING
9. Self-Test - PRESS BUTTON (must have VOR reception)

**FAA Approved**  
**Revised: February, 1979**  
**P/N 96-590010-19**

**PERFORMANCE** - No change

Approved:

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

**BEECHCRAFT BARONS 95-B55,  
95-B55A, E55, E55A, 58, 58A LANDPLANES**

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

**for the  
NICKEL-CADMIUM BATTERY  
AND  
CHARGE CURRENT DETECTOR**

**GENERAL**

The information in this supplement is FAA Approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Flight Manual when the airplane is equipped with a Nickel-Cadmium Battery and Charge Current Detector installed in accordance with BEECHCRAFT FAA approved data.

The Battery Charge Current Detector consists of a circuit which illuminates an amber light on the instrument panel whenever the battery charge current is above normal. The system is designed for a continuous monitor of battery condition.

The purpose of the Battery Charge Current Detector is to inform the pilot of battery charge currents which may damage the battery. The system senses all battery current and provides a visual indication of above normal charge current. Following a battery engine start, the battery recharge current is very high and causes the illumination of the BATTERY CHARGE light, thus providing an automatic self test of the detector and the battery. As the battery approaches a full charge and the charge current decreases to a satisfactory amount, the light will extinguish. This will normally occur within a few minutes after an engine start, but may



require a longer time, if the battery has a low state of charge, low charge voltage per cell (20 cells battery), or low battery temperature.

The light may occasionally reappear for short intervals when heavy loads switch off, or engine speeds are varied near generator cut-in speed. High battery temperatures or high charge voltage per cell will result in a high overcharge current which will eventually damage the battery and lead to thermal runaway. Illumination of the BATTERY CHARGE light in flight alerts the pilot that conditions may exist that may eventually damage the battery. The battery should be turned off to prevent battery damage. The following procedures outline the actions to be taken in the event the BATTERY CHARGE light illuminates.

## **EMERGENCY PROCEDURES**

### **DURING CRUISE**

The illumination of the amber caution light, placarded BATTERY CHARGE, in flight indicates a possible malfunction of the battery. Turn the Battery Switch - OFF. The caution light should extinguish and the flight may proceed to destination. Failure of the light to extinguish with the battery switch off indicates a battery system or a charge current detector system malfunction. The aircraft should be landed as soon as practicable. (The battery switch should be turned on for landing in order to avoid electrical transients caused by power fluctuations.) After landing perform a During Shutdown Battery Condition check.

## **NORMAL PROCEDURES**

### **BEFORE STARTING ENGINES**

1. Caution Light (BATTERY CHARGE) - PRESS TO TEST for illumination.

## **DURING ENGINE START**

Provided sufficient energy is used from the battery during the first engine start, the amber caution light, placarded BATTERY CHARGE, will illuminate approximately 6 seconds after the generator is on the line. This indicates a charge current above normal. The light should extinguish within 5 minutes. Failure to do so indicates a partially discharged battery. Continue to charge battery. Make a check each 90 seconds using the procedure outlined below until the charge current fails to decrease and the light extinguishes. Failure of the light to extinguish indicates an unsatisfactory condition. The battery should be removed and checked by a qualified Nickel-Cadmium Battery shop.

1. One Alternator/Generator - OFF.
2. Engine Speed (Engine with Alternator/Generator On) - 1000 RPM (Voltmeter indicating approximately 28 volts).
3. After loadmeter needle stabilizes, momentarily turn the battery switch off and note the change in meter indication.

## **NOTE**

The change in load meter indications is the battery charge current and should be no more than .025 (only perceivable needle movement) within 5 minutes. Failure to obtain a reading below .025 within 5 minutes indicates a partially discharged battery. Continue to charge battery repeating the check each 90 seconds until the charge current decreases below .025. No decrease of current between checks indicates an unsatisfactory condition. The battery should be removed and checked by a qualified Nickel-Cadmium Battery shop.

## DURING SHUTDOWN

Battery - CONDITION AND CHARGE (If the BATTERY CHARGE light is extinguished, the battery is charged and the condition is good. If the light is illuminated and fails to extinguish within 3 minutes of charging, perform the following check:

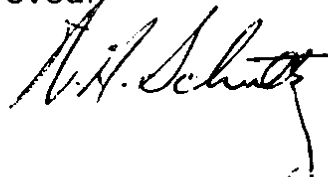
1. One Alternator/Generator - OFF.
2. Engine Speed (Engine with Alternator/Generator ON) - 1000 RPM (Voltmeter indicating approximately 28 volts).
3. After loadmaster needle stabilizes, momentarily turn the battery switch off and note change in meter indication.

## NOTE

The change in loadmeter indication is the battery charge current and should be no more than .025 (only perceivable needle movement). If the result of this check is not satisfactory, allow the battery to charge repeating the check each 90 seconds. If the results are not satisfactory within 3 minutes, the battery should be removed and checked by a qualified Nickel-Cadmium Battery shop.

**PERFORMANCE** - No change

Approved:



for Chester A. Rembleske  
Beech Aircraft Corporation  
DOA CE-2

**FAA Approved**  
**October, 1976**

**P/N 96-590010-21**

**BEECHCRAFT 95-B55, 95-B55A, E55, E55A, 58,  
58A, 58P, 58PA, 58TC & 58TCA LANDPLANE**

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

**for the**

**NARCO AVIONICS RNAV 161 TSO  
MULTI-WAYPOINT AREA NAVIGATION SYSTEM**

**GENERAL**

The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the Narco Avionics RNAV 161 Multi-waypoint Area Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic FAA Approved Airplane Flight Manual only as set forth within this document. Users of this manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

**LIMITATIONS**

1. The Area Navigation mode may not be used as a primary system under IFR conditions except on approved approach procedures, approved area navigation airways, and random area navigation routes when approved by Air Traffic Control.

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2. The Area Navigation mode can only be used with colocated facilities (VOR and DME signals originate from the same geographical location).
3. STD mode must be selected for non-RNAV VOR/LOC navigation.
4. In the approach mode the waypoint use maximum distance is 50 nautical miles.

## **EMERGENCY PROCEDURES**

### **CAUTION**

DME may unlock due to loss of signal with certain combinations of distance from station, altitude, and angle of bank.

1. If NAV flag appears while in the Area Navigation mode, check for correct frequency.
2. If VOR or DME signals are intermittent or lost, utilize other navigation equipment as required.
3. If NAV flag appears during an approach, execute published missed approach and utilize another approved facility.

## **NORMAL PROCEDURES**

### ***PREFLIGHT***

#### **LIGHT SEGMENT TEST**

To check the display light segments and the function pushbutton lights, perform the following:

1. Switch the system on using either the panel mounted

ON/OFF switch or the switch on the navigation receiver depending on the installation.

2. Depress TEST pushbutton. Bearing and distance displays will show 888.8, frequency display will show 188.88, and waypoint number display will show an 8. All function pushbuttons (WPT NO, DIST, BRG, FREQ) will illuminate. If the preceding happens, then the system lights and light segments are functioning properly.

#### **“KEEP ALIVE” MEMORY CHECK**

If the RNAV 161 system has recently been used, switch ON the system and recall data from the memory banks. Compare data with the data of the flight plan.

If the system has not been recently used enter dummy waypoint number, bearing, distance, and frequency, data (see PROGRAMMING for data procedure) switch the system OFF. Wait several minutes before switching the system ON and then recall dummy program from memory. If the output agrees with the input, the system is functioning properly.

#### **AREA NAVIGATION FUNCTIONAL TEST**

The following procedure can only be used at airports equipped with, or in range of, a colocated VOR/DME station.

See PROGRAMMING for data entry procedures.

1. Switch the system ON.
2. Place the RNAV 161 in STD mode.
3. Press FREQ and keyboard known VOR frequency and depress ENTR.
4. Find and record the angle to the VOR station by

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- centering the D-Bar with a TO showing (TO/FROM flag).
5. Press BRG and keyboard 120° plus indicated VOR radial of step 4. Depress ENTR.
  6. Press DIST and keyboard a waypoint distance equal to the indicated DME value.
  7. Place the RNAV 161 in RNAV E mode.
  8. Rotate the HSI/OBS until the D-Bar centers with a TO flag.

The RNAV 161 distance-to-station should now read a value equal to the DME distance ( $\pm .5$  NM) and the indicated selected course should read 60° greater than the recorded VOR angle to station.

### *PROGRAMMING*

Pertinent information (waypoint number, station frequency, waypoint bearing, and waypoing distance) for up to ten waypoints is entered into the memory from the control unit. Programming may be completed prior to takeoff or during the flight. Any combination of navigational facilities (RNAV waypoint, VOR/DME, ILS) may be loaded into the computer; however, it is desirable that each facility be numbered and loaded in the sequence it is to be used.

### RNAV WAYPOINTS

1. Available waypoint numbers are 0 through 9.
2. Switch the system ON using the instrument-panel-mounted ON/OFF switch or the switch on the navigation receiver depending on the installation.
3. Waypoint number is programmed by depressing the function pushbutton marked WP NO and depressing a single number (0 through 9) on the keyboard. Set waypoint 0 for the first waypoint entry.

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## NOTE

All displays will extinguish by depressing WP NO and the WP NO function pushbutton will be illuminated indicating that the keyboard has been connected to the waypoint display. On depressing a keyboard number all data in the memory for that number will be displayed.

4. Depress BRG and keyboard the intended bearing. Bearings from  $0.0^{\circ}$  to  $359.9^{\circ}$  are possible in increments of  $.1^{\circ}$ .

Format: XXX.X i.e. 059.8

Decimal point is set automatically for bearings greater than  $100^{\circ}$ .

## NOTE

Pressing the BRG (bearing) pushbutton causes the bearing display to extinguish, and the BRG pushbutton to be illuminated indicating that the keyboard and the bearing display are connected.

5. Depress DIST, enter waypoint distance using the keyboard. A complete distance entry will be indicated when the ENTR pushbutton is illuminated. Depress ENTR to enter the waypoint distance into the memory. Distances in nautical miles from 0.0 through 199.9 in increments of 0.1 may be entered.

Format: XXX.X i.e. 089.1



Distances greater than 100 NM will have the decimal point inserted automatically if the operator fails to place it.

#### NOTE

Pressing the DIST (distance) pushbutton causes the distance display to extinguish, and the DIST pushbutton to be illuminated indicating that the keyboard and the distance display are connected.

6. Depress FREQ, enter four or five digit frequency number using keyboard. When four digits have been entered, the ENTR function pushbutton will light. If the desired frequency contains only four digits, depress ENTR and the frequency data will be entered into the memory. The lighted pushbutton will extinguish and the display will shift one space to the left automatically adding a zero, for example from 108.2 to 108.20. Five digit frequencies must have all five digits showing on the display before depressing ENTR.

Receiver frequencies from 108.00 through 117.95 MHz, in increments of 50 KHz may be entered.

Four and five digit numbers may be entered and the computer will automatically set the decimal point.

#### NOTE

Pressing the FREQ pushbutton causes the frequency display to extinguish, and the FREQ pushbutton to be illuminated indicating that the

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keyboard and the frequency display are connected.

7. The RNAV 161 is now fully programmed for waypoint "0". For each additional waypoint entry repeat steps 3 through 6.

## ENTRY ERRORS IN PROGRAMMING

Errors may be procedural or errors of depressing the wrong key or pushbutton.

Errors made in entering data may be corrected as follows:

1. Flashing Display - The displays will flash whenever bearing, distance, or frequency data is about to be changed in the active or in-use waypoint.

If the data change is intentional:

- a. Continue the programming procedures as previously described.

If the data change is unintentional:

- a. Using the keyboard, enter into the display any number which will satisfy that display as indicated by the lighting of the ENTR pushbutton, but DO NOT depress the ENTR pushbutton.
- b. Recall the waypoint data from the memory by depressing the WP NO pushbutton and then, on the keyboard, depress the active waypoint number.

The display will have ceased flashing and the waypoint data in the memory will NOT have been changed.

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2. Blank Display - Entering a bearing in excess of 359.9° or a distance in excess of 199.9 NM will cause that display to go blank.
  - a. Enter the correct bearing or distance and then depress the ENTR pushbutton and the correct data will be stored in the memory.
3. Correcting Numerical Errors:
  - a. If a wrong number has been struck on the keyboard and the ENTR light is off, clear the error by depressing the keyboard's "C" pushbutton and then make the correct number input.
  - b. If a wrong number has been struck on the keyboard and the ENTR light is on, clear the error by depressing the function pushbutton associated with the display and then enter the correct data, using the keyboard and the ENTR function pushbutton.
4. In general, correction of data in any waypoint number may be accomplished as follows:
  - a. Recall the waypoint data by pressing the WP NO pushbutton and then, on the keyboard, press the number of the waypoint.
  - b. Press the pushbutton associated with the displayed data to be changed (if distance is to be changed, press the DIST pushbutton).
  - c. Using the keyboard enter the correct data into the display. The ENTR pushbutton will light when the display is satisfied.
  - d. Press the ENTR pushbutton to transfer the displayed data into memory.

## NOTE

Step b, c, and d are the normal programming procedures and step a is the normal data recall procedure.

### *QUICK ENTRY PROCEDURE*

The table that follows defines the steps required to program waypoint 5 where the VOR/DME station is to be offset 127.5 NM along the 63.0° radial. Station frequency is 115.3 MHz.

| Step | Press Pushbutton | Display     | Press Keyboard | Display     |
|------|------------------|-------------|----------------|-------------|
| 1    | WP NO            | ALL BLANK   | 5              | WP NO 5*    |
| 2    | BRG              | BRG Blank   | 63.0           | BRG 063.0   |
| 3    | DIST             | DIST Blank  | 127.5          | DIST 127.5  |
| 4    | FREQ             | FREQ Blank  | 115.3          | FREQ 115.30 |
| 5    | ENTR             | Freq 115.30 | -              | -           |

\* All data currently in RNAV memory for waypoint 5 will be displayed (memory recall).

### *INFLIGHT*

Preset waypoints and programs in the memory may be recalled and used as required.

### WAYPOINT SELECTION

The thumbwheel switch in the upper left corner of the RNAV

161 is used to select the active waypoint. Reference to the flight plan will verify that the active waypoint has been selected.

The TO/FROM flags on the HSI/OBS and the distance displayed on the DME indicator will signal the time to change from one active waypoint to the next active waypoint.

NAV flag appearance on the HSI/OBS will signal a need to change waypoint number (frequency) or the need to change modes (the mode selector switch is directly below the active waypoint thumbwheel, in the lower left corner of the RNAV 161 unit).

## RNAV OPERATION

Flight from waypoint to waypoint can be accomplished by using the programmed bearing between waypoints and by keeping the left-right needle of the HSI/OBS centered. Enroute sensitivity in the RNAV E mode is  $\pm 2.5$  NM or 5 NM constant course width.

Course width in the RNAV APPR mode is 2.5 NM or a sensitivity of  $\pm 1.25$  NM. The RNAV APPR mode is for use when within ten nautical miles of the terminal waypoint. The maximum range for the RNAV APPR mode is 50 nautical miles.

Landings can be made enroute, that is between pre-programmed waypoints, and the RNAV 161 system switched off after landing and the pre-programmed navigational data will be retained in the RNAV 161 memory banks. A memory "Keep Alive" circuit makes this possible.

## RNAV APPROACH

The RNAV APPR mode may be used for runway location.

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Program a waypoint to coincide with the approach end of the runway (this may be done in flight or during preflight) then fly the bearing programmed as directed by the HSI/OBS.

## **CONVENTIONAL VOR**

The programming technique for conventional navigation directly toward or away from a VOR facility without a colocated DME is similar to that for RNAV waypoints except that no values are programmed for bearing and distance. Waypoint number and frequency are the input data required.

## **ILS APPROACH (front course and back course)**

Programming an ILS approach is accomplished in the same way as programming conventional VOR.

## **MISSED APPROACH**

If the published missed approach utilizes an RNAV waypoint or VOR facility, it may be entered into the memory any time prior to the approach. Programming is as set forth in the preceeding sections.

## **WEIGHT AND BALANCE - No change.**

## **SYSTEMS DESCRIPTION**

The RNAV 161 is a unit of the RNAV 161 Multi-Waypoint Area Navigation System. The system is composed of the following basic units.

1. RNAV 161 - Function: channels data to receiver and VOR/LOC detector out to RNAV, displays data, and mode lights.

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2. HSI/OBS (Horizontal Situation Indicator/Omni Bearing Selector) - Function: resolver, left-right needle, to/from and NAV flags.
3. DME (Distance Measuring Equipment) - Function: interrogator/receiver
4. DME (Indicator) - Function: displays distance from/to station
5. NAV REMOTE RECEIVER - Function: receives signal from station and channels data to DME and RNAV 161

This system furnishes the pilot with the alternative to station-to-station VOR navigation and that is: RNAV (Area Navigation). Using this system a pilot can electronically move a VOR/DME (VORTAC or TACAN within NAV frequency band) station to any point within that station's service coverage area. For example, the VOR/DME station could be relocated to a point on an airport's approach pattern; or a relocated station could define one end of a holding pattern. Cross-country flights can be made straight by off-setting VOR/DME stations as required to form a straight line-of-flight from departure point to destination.

Data is entered into the RNAV 161 system by keyboard and function pushbuttons. Pushbuttons are labeled and lighted. Data (waypoint number, bearing, distance, and frequency) is displayed on the RNAV 161 panel. Readout is by light segments. Mode selection (STD, RNAV E, RNAV APPR) is by a three-position selector switch. In flight, waypoint number selection is made by rotating a thumbwheel.

System output is via the HSI/OBS, the DME indicator, and the display of the RNAV 161 panel.

Memory capacity of the RNAV 161: 10 waypoints, digits 0 through 9.

Displays are lighted with incandescent lights and the intensity of the lights is automatically controlled by a sensor that is activated by cabin ambient light. A TEST pushbutton lights all the usable segments of the display lights as a check.

### **HANDLING, SERVICE, AND MAINTENANCE**

The RNAV 161 has a "KEEP ALIVE" circuit that makes it possible to retain data in the memory banks when the unit is switched OFF. Source of the 11 to 33 VDC required for the "Keep Alive" circuit is the airplane battery. Current drain is 0.1 milliamperes. It is important that the battery not be removed from the airplane if data in the memory is to be retained.

APPROVED:

*For*   
W. H. Schultz  
Beech Aircraft Corporation  
DOA CE-2



**BEECHCRAFT BARONS 95-B55  
AND 95-B55A LANDPLANES**

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

**OPERATION OF  
UNITED KINGDOM REGISTERED AIRCRAFT**

**GENERAL**

This document is to be attached to the Pilot's Operating Handbook 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 Flight Manual.

**LIMITATIONS**

**CERTIFICATION CATEGORY**

The BEECHCRAFT Barons B55 and B55A (Special Export Configuration) are eligible for certification in the United Kingdom in the Transport Category (Passenger). This particular aeroplane may, however, be restricted to another category and a particular use, and this will be stated in the Certificate of Airworthiness.

**PERFORMANCE**

When certified in the Transport Category (Passenger), the aeroplane is classified in Performance Group E. For the purpose of establishing compliance with the Air Navigation Performance Group E Regulations, the Performance Data in the Pilot's Operating Handbook, Beech Part No. 96-590011-17, except as modified by this supplement, is to be used.

## CRUISE

For the purpose of compliance with the legislation governing Flight Over Water, the True Airspeed to be assumed is 175 knots.

## CREW AND OCCUPANTS

The minimum crew is one pilot.

The total number of persons carried shall not exceed 6 nor exceed the number for which seating accommodation approved for use during take-off and landing is provided. Children under the age of three years who are carried in the arms of passengers may be left out of account for this purpose. The standard seating capacity is 4, but can optionally be equipped with 5 or 6 seats.

## AIR TEMPERATURE

The maximum air temperature for scheduled operation is ISA + 23°C. No minimum temperature has been established.

## TYPE OF OPERATION

The aeroplane shall not be flown at night unless the required equipment is carried and it is permitted by the Air Navigation Legislation.

All flights under heavy icing conditions or extended flights under moderate icing conditions are prohibited.

Flight into areas of light-to-moderate icing conditions should be undertaken with caution only when the essential equipment for extended flight under light icing conditions is available.

Flight under moderate icing conditions for short periods of

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time and extended flight under light icing conditions have been demonstrated as satisfactory only when the essential equipment listed below is available.

1. Deicer boots on wing and empennage leading edge surfaces.
2. Heated pitot tube mast and fuel tank vents.
3. Emergency airspeed static source.
4. Dual vacuum sources for flight instruments (standard equipment).
5. Propeller anti-icing system.
6. Windscreen anti-icing system when landings under icing conditions are anticipated.

## **AUTOMATIC PILOT**

Minimum permissible altitudes with Century III or IV Automatic Pilots engaged are:

Cruise ..... 1000 feet above terrain  
Coupled to ILS  
Glideslope and Localizer ..... 350 feet above terrain

## **NORMAL PROCEDURES**

### **FLAPLESS LANDING**

Manoeuvre to final approach maintaining 10 knots above the Approach Speed appropriate to the weight shown in the Landing Distance chart. Extend the landing gear. Maintain this speed down to the 50 foot height point.

## **PERFORMANCE**

### **TAKE-OFF DISTANCE**

Take-off distance over 50 foot obstacle is shown in PERFORMANCE section for varying air temperatures, aerodrome altitudes, weights, and reported wind components.

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The associated conditions, take-off speeds and example, are presented directly on the graph. The air minimum single engine control speed with flaps up, clear of ground effect and with 5° of bank toward the live engine is 78 knots IAS. The total distances shown over 50 ft should be increased 18% for operation on short dry grass surface with firm subsoil.

## LANDING

The total distance over a 50-foot obstacle shown on the Normal Landing Distance graph should be increased 18% for operation on short dry grass with a firm subsoil.

## NOTICE

In the event that it becomes necessary to replace the manual with a new one, or the manual is replaced by a new reissue, it is important that you retain the weight and balance papers that are unique to your aeroplane, and incorporate them into the new manual. Also when a new manual is going into service, it is recommended that the supplements of the old manual, which are not contained in the new manual, be retained from the Supplements section and inserted into the new manual. A check of dates of the supplements is advised to ascertain whether you have current supplements.

Approved:

*for*   
Chester A. Rembleske  
Beech Aircraft Corporation  
DOA CE-2

**BEECHCRAFT BARON 95-B55, 95-B55A, E55, E55A,  
58, 58A, 58P, 58PA, 58TC, and 58TCA LANDPLANES**

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

**BENDIX NP-2041A NAV COMPUTER PROGRAMMER**

**GENERAL**

The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the Bendix NCP-2040 Nav Programmer System with the NP-2041A Nav Computer Programmer in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

**LIMITATIONS**

1. The Area Navigation Function may not be used as a primary navigation system under IFR conditions, except on approved approach procedures, approved area navigation airways, and random area navigation routes when approved by Air Traffic Control.
2. The maximum distance for waypoint location is 199.9 nautical miles from the station.

3. The Area Navigation Function can only be used with colocated facilities (VOR and DME signals originate from the same geographical location).

## **EMERGENCY PROCEDURES**

1. Dashed BRG and/or DST display windows imply an external (NAV or DME) flag input. If either signal is lost, do not use the NP-2041A for area navigation.

The source of the external flag can be determined by setting the mode selector to VOR/LOC and observing the indications. A dashed BRG display indicates either a loss of NAV signal, or an ILS frequency is selected. A dashed DST display indicates a loss of DME signal. If neither display is dashed, the NAV and DME are not paired properly.

### *CAUTION*

The DME may unlock due to loss of signal with certain combinations of distance from the station, altitude, and attitude.

2. If the system automatically displays a lamp test, an internal failure in the NP-2041A is indicated. If a failure is observed, do not use the NP-2041A for area navigation.
3. A dashed EL display window indicates an altimeter flag and implies loss of slant range correction.

## **NORMAL PROCEDURES**

1. SPK VOL (& ON/OFF) Switch - ON (CNA 2010 System)
2. DME - ON

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3. DME (Frequency Pairing) Switch - N1 (CNA 2010 System)
4. KBD/NAV 1/COM 1 Selector - KBD (CNA 2010 System)

#### NOTE

The NP-2041A NAV Computer Programmer is now coupled to the CNA 2010 NAV/COM System. Only the no. 1 VOR and DME receivers supply information to the NP-2041A NAV Computer Programmer.

5. OFF/VOR-LOC/TEST/RNAV/APR Selector - VOR/LOC (NP-2041A System)
6. SBY/ACT/BRG-DST/KTS-TTS Selector - SBY (NP-2041A System)
7. SBY/WPT Key - Depress
8. No. 1 Key - Depress (Note the no. 1 indicated in the SBY display window) Program Standby Waypoint Number 1 Parameters in any sequence. Press ENTER key after each parameter programmed.

#### NOTE

Pressing any one of the **FREQ**, **BRG**, **DST**, **EL**, or **CRS** keys causes a flashing dot to appear in the associated display window. A flashing dot indicates the parameter that is being addressed. As number keys corresponding to data are pressed, the numbers appear in the addressed window. If valid data is entered into the window, the flashing dot will extinguish when the **ENTER** key is pressed. If invalid data is entered in the window, the data will be rejected when the **ENTER** key is pressed. The window will revert to a flashing dot which indicates data should be reentered.

9. VALID DATA LIMITS:

|               |                               |
|---------------|-------------------------------|
| NAV Frequency | 108.00 to 117.95 (.05 steps)  |
| COM Frequency | 118.00 to 135.97 (.025 steps) |
| BRG           | 000.0 to 359.9                |
| DST           | 0.0 to 199.9                  |
| EL            | 00 to 99 (100-ft increments)  |
| CRS           | 000 to 359                    |

- a. STATION FREQUENCY - Press FREQ key; press number keys corresponding to the frequency of the VOR station; and press the ENTER key.
- b. WAYPOINT BEARING - Press BRG key; press number keys corresponding to the waypoint bearing; and press the ENTER key.
- c. WAYPOINT DISTANCE - Press DIST Key; press number keys corresponding to waypoint distance; and press the ENTER key.
- d. STATION ELEVATION - Press EL key; press number keys corresponding to the station elevation in hundreds of feet; and press the ENTER key.
- e. INBOUND AND OUTBOUND COURSE - Press CRS key; press number keys corresponding to the desired inbound or outbound course (depending upon whether IN or OUT annunciator lamp is illuminated); and press the ENTER key.

Press CRS XFR key; IN/OUT annunciator lamps will switch. Press CRS key, press number keys corresponding to the desired inbound or outbound course (as annunciated); and press the ENTER key.

10. Repeat Steps 6 and 7 for any (or all) of the remaining waypoints.



11. Press SBY/WPT key; press number key corresponding to the waypoint desired to be recalled from memory; and verify data.
12. Set the display selector to BRG/DST.
13. Press the WPT XFR key to transfer the standby waypoint to active.
14. With the mode selector set to VOR/LOC, the following data is displayed:
  - a. DISPLAY SELECTOR SET TO BRG/DST - Bearing and distance to the selected VOR/DME station are displayed.
  - b. DISPLAY SELECTOR SET TO KTS/TTS - Ground speed in knots and time-to-station are displayed in minutes.
  - c. HSI - The HSI presents unprocessed information with conventional angular sensitivity, i.e., full scale deviation equals 10 degrees off course.
  - d. DISPLAY SELECTOR SET TO SBY - Data stored for standby waypoint (number appearing in SBY window) is displayed, and can be altered as desired.
  - e. DISPLAY SELECTOR SET TO ACT - Data stored for active waypoint (number in ACT display window) is displayed, and can be altered as desired.
15. With the mode selector set to RNAV, the following data is displayed:
  - a. DISPLAY SELECTOR SET TO BRG/DST - Bearing and distance to the selected waypoint are displayed.

- b. DISPLAY SELECTOR SET TO KTS/TTS - Ground speed in knots and time-to-waypoint in minutes are displayed.
- c. HSI - The HSI presents RNAV information with constant deviation, i.e., full scale deviation represents 5 nautical miles off course out to a distance of 100 nautical miles. Beyond 100 nautical miles, full scale deviation represents 3 degrees off course.
- d. DISPLAY SELECTOR SET TO SBY - Data stored for standby waypoint (number appearing in SBY window) is displayed, and can be altered as desired.
- e. DISPLAY SELECTOR SET TO ACT - Data stored for active waypoint (number appearing in ACT window) is displayed, but cannot be altered.

#### NOTE

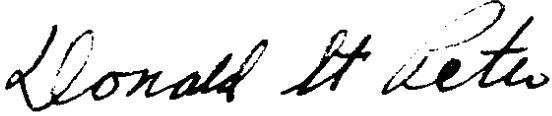
Provided the KBD/NAV 1/COM 1 selector on the COM/NAV unit is set to KBD, the NAV receiver and DME will be automatically tuned to the frequency stored for the active waypoint. The stored inbound course will be displayed in the CRS window for 30 seconds to allow the CRS control (OBS) on the IN-831 HSI to be set to that course. After the waypoint has been passed, the CRS XFR key can be pressed to recall the outbound course which will appear for 30 seconds to allow the CRS to be reset.

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**P/N 96-590011-21**

16. With the mode selector set to APR, the displays are the same as RNAV, except full scale deviation represents 1.25 nautical miles off course out to 25 nautical miles. Beyond 25 nautical miles, full scale deviation represents 3 degrees off course.
17. A system self-test can be performed by placing the mode selector in the TEST position. Valid indications are as follows:
  - A. NP-2041A
    - a. FREQ, FL and CRS windows are dashed.
    - b. BRG window equals  $180.0 \pm 0.5$  degrees.
    - c. DST window equals 30.0 nautical miles.
  - B. HSI
    - a. The needle should center at  $0 \pm 2$  degrees TO.
    - b. Rotate the CRS control on the HSI for a  $10 \pm 2$  degrees course. The horizontal deviation bar will go to full scale deviation to the right.
    - c. Rotate the CRS control on the HSI for a  $350 \pm 2$  degrees course. The horizontal deviation bar will go to full scale deviation to the left.
    - d. Provided the system performs as described, the RNAV system should be considered fully operational.
18. A lamp test can be performed by placing the SQ/OFF/L switch on the COM/NAV unit in the "L" position. Normal

indications are as follows:

- a. Hundred MHz numerals equals 1.
- b. All other numerals equal 8's.
- c. IN, OUT, and keyboard annunciators "ON".

Approved: 



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

**P/N 102-590000-45**

**BEECHCRAFT BARONS 95-B55, 95-B55A, E55, E55A,  
58, 58A, 58TC, 58TCA, 58P, and 58PA  
LANDPLANES**

**PILOT'S OPERATING HANDBOOK AND FAA APPROVED  
AIRPLANE FLIGHT MANUAL SUPPLEMENT  
for the  
KING KNC-610 AREA NAVIGATION SYSTEM**

**GENERAL**

The information in this supplement is FAA-approved material and must be attached to the FAA Approved Airplane Flight Manual when the airplane has been modified by installation of the King KNC-610 Area Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic FAA Approved Airplane Flight Manual only as set forth within this document. Users of this manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

**LIMITATIONS**

1. This system shall not be used as a primary system under IFR conditions except on approved approach procedures, approved area navigation airways, and random area navigation routes when approved by Air Traffic Control.
2. This system is to be used only with colocated facilities (VOR and DME signals originate from the same geographical location).

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November, 1978  
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## **EMERGENCY PROCEDURES**

### ***CAUTION***

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the Area Navigation mode, check for correct frequency.
2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.
3. If NAV flag appears during an approach, execute published missed approach and utilize another approved facility.

## **NORMAL PROCEDURES**

1. VHF NAV - ON
2. DME - ON
3. Mode Selector - SELECT VOR/DME, RNAV or APPR
4. NAV Frequency - SET
5. DME Frequency - SET
6. Waypoint Bearing - SET WAYPOINT RADIAL FROM VORTAC
7. Waypoint Distance - SET WAYPOINT DISTANCE FROM VORTAC
8. OBS control - DESIRED MAGNETIC COURSE
9. Self-Test - ACTUATE (must have VOR reception)

## PERFORMANCE

No change

Approved:

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

**BEECHCRAFT BARON 95-B55, 95-B55A,  
E55, E55A, 58, 58A, 58P, 58PA, 58TC and  
58TCA  
LANDPLANES**

**PILOT'S OPERATING HANDBOOK AND FAA  
APPROVED  
AIRPLANE FLIGHT MANUAL SUPPLEMENT  
for the  
KING KNS-81 INTEGRATED NAVIGATION SYSTEM**

**GENERAL**

The information in this supplement is FAA-approved material and must be attached to the Pilot's Operating Handbook and FAA Approved Airplane Flight manual when the airplane has been modified by installation of the King KNS-81 Navigation System in accordance with Beech-approved data.

The information in this supplement supersedes or adds to the basic Pilot's Operating Handbook and FAA Approved Airplane Flight Manual only as set forth within this document. Users of this manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

**LIMITATIONS**

1. The Area Navigation mode may not be used as a primary system under IFR conditions except on approved approach procedures, approved airways, and random area navigation routes when approved by Air Traffic Control.
2. The Area Navigation and VOR-PAR modes can only



be used with colocated facilities (VOR and DME signals originate from the same geographical location).

3. VOR or VOR-PAR modes must be selected when flying directly to or from a VORTAC facility.

## **EMERGENCY PROCEDURES**

### ***CAUTION***

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the Area Navigation mode, use CHK button to check for validity of raw DME and VOR data.
2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.
3. If NAV flag appears and/or DME information is lost during an approach, execute published missed approach and utilize another approved facility.

## **NORMAL PROCEDURES**

### **PREFLIGHT**

### ***AREA NAVIGATION FUNCTIONAL TEST***

The following procedure applies only to airports equipped

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with, or in range of, a colocated VOR/DME station.

1. Place the KNS-81 in VOR mode.
2. Find and record the angle from the VOR station by centering the course deviation needle with the TO/FROM flag giving a "FROM" indication.
3. Program a waypoint radial angle equal to the OBS value determined in Step 2.
4. Program a waypoint distance equal to the indicated DME value.
5. Place the KNS-81 in RNAV.

The KNS-81 is operating properly if the distance to waypoint is 0 + 1.0 NM and the course deviation needle is within a dot of being centered.

## PROGRAMMING

Pertinent information (waypoint number, station frequency, waypoint radial, and waypoint distance) can be entered into the memory. Programming may be completed prior to takeoff or during the flight. Any combination of navigational facilities (RNAV waypoint, VOR/DME, ILS) may be loaded into the computer; however, it is desirable that each facility be numbered and loaded in the sequence it is to be used.

### *RNAV WAYPOINTS*

1. Turn the system on by rotating the ON/OFF switch clockwise.

2. Put waypoint 1 in the WPT window by turning the WPT knob. Turn the knob in either direction to get "1".
3. Select the waypoint 1 frequency using the data input controls which are the two concentric knobs on the right.
4. Select the waypoint 1 radial by depressing the DATA button. This will move the >< (caret) from FRQ to RAD. Select the new radial with the data input controls.
5. Select the waypoint 1 distance by again depressing the DATA button. This will move the >< from RAD to DST. Select the new distance with the data input controls.
6. This completes the programming for the first waypoint.  
■ Follow these procedures for all selected waypoints.

### *CONVENTIONAL VOR*

1. The programming technique for conventional navigation directly toward or away from a VOR facility without a colocated DME is similar to that for RNAV waypoints. Putting the waypoint number and frequency into the memory is accomplished in the same manner. The RAD and DST displays will display dashes during VOR and VOR-PAR operation.

### *ILS APPROACH (Front course and Back course)*

1. Programming an ILS approach is accomplished in the same manner as programming conventional VOR.

## ***MISSED APPROACH***

1. If the published missed approach utilizes an RNAV waypoint or VOR facility, it may be entered into the memory any time prior to the approach. This is accomplished in the same manner set forth in CONVENTIONAL VOR and RNAV WAYPOINTS in this section.

## ***INFLIGHT***

1. Preset waypoints may be recalled from memory and put into active use as required.

Turn the WPT knob as required to select the desired waypoint. The preset waypoint number, frequency, radial and distance will appear in their respective displays. The WPT display will blink to indicate that the waypoint displayed is other than the active waypoint.

2. Verify that the data is correct.

## **NOTE**

Revisions to the waypoint data can be programmed at this time by entering the new waypoint parameters.

3. When return to the active waypoint is desired, press the RTN button. The active waypoint along with its data will be displayed.
4. When navigation to the displayed (blinking WPT) waypoint is desired, press the USE button. The WPT

display will cease blinking and the displayed waypoint becomes the active waypoint.

5. The raw VOR & DME data can be checked at any time by pressing the CHK button. The radial from the VOR will be displayed above RAD and the DME distance will be displayed above DST.

### *RNAV OPERATION*

If the system is receiving valid signals from a colocated VOR-DME facility, it will supply linear deviation information to the Horizontal Situation Indicator (or Course Deviation Indicator). Enroute (RNAV) sensitivity, available by turning the MODE selector knob until RNAV is displayed, provides a constant course width of  $\pm 5$  NM full scale.

Approach (RNAV-APR) sensitivity, available by turning the mode selector knob until RNAV-APR is displayed, provides a constant course width of  $\pm 1 \frac{1}{4}$  NM full scale. Approach sensitivity should be selected just prior to final approach course interception. Time and distance to the waypoint and computed groundspeed are displayed on the DME display.

### *CONVENTIONAL VOR OPERATION*

VOR or VOR-PAR modes are selected by turning the MODE selector knob until VOR or VOR-PAR is displayed. In VOR mode the remote DME is automatically tuned when the KNS-81 is selected as the tuning source. Upon lock-on, distance, groundspeed and time to the VORTAC station will be displayed on the DME display. The HSI (CDI) will display conventional angular crosstrack deviation from the selected course ( $\pm 10^\circ$  full scale). In VOR-PAR mode, operation is identical to VOR except the HSI (CDI) will display crosstrack deviation of  $\pm 5$  NM full scale from the selected course.

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Course width will be constant irrespective of distance from the VORTAC.

Anytime the RAD button is engaged, the radial from the waypoint/station will be displayed on the DME knots display along with an "F" on the DME time to station display.

#### NOTE

The RAD switch is not the momentary type, therefore, the switch must be pressed again for the normal DME information to be displayed.

#### *ILS OPERATION*

Whenever an ILS Frequency is put "IN USE" the mode display will remain the same (either VOR, VOR-PAR, RNAV, RNAV-APR displayed) but the RAD & DST displays will be blanked. Absence of the LOC/GS functions is annunciated by the NAV and GS flags in the HSI (CDI). Only angular deviation is provided in the ILS Mode.

#### *RNAV APPROACH*

The RNAV Approach (RNAV-APR) mode may be used for runway location (by placing a waypoint at the approach end of the runway) during an approach to an airport. Turn the MODE selector knob to select RNAV-APR. In RNAV-APR the deviation needle on the HSI (CDI) will display crosstrack deviation of  $\pm 1 \frac{1}{4}$  NM full scale. All other aspects of the RNAV-APR mode are identical to the RNAV mode.

**PERFORMANCE** - No change

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## **WEIGHT AND BALANCE - No change**

### **SYSTEMS DESCRIPTION**

The King KNS-81 is an integrated navigation system combining a 200-channel VOR/Localizer receiver, a 40 channel glideslope receiver and a digital RNAV computer with a capability of preselection and storage of 9, or on later models 10, VOR/LOC frequencies and equivalent sets of RNAV waypoint parameters. A DME System must be used in conjunction with the KNS-81.

The KNS-81 can be operated in any one of three basic modes: VOR, RANV, or ILS. To change from one mode to another the rotary MODE selector knob on the left side of the panel is rotated, except that the ILS Mode is entered automatically whenever an ILS frequency is channeled as the ACTIVE frequency. The display will annunciate the mode by lighting a message beside the WPT display, except in the ILS mode in which case the RAD & DST displays are blanked to denote the ILS mode. In addition to the standard VOR & RNAV enroute (RNAV) modes, the KNS-81 has a constant course width or parallel VOR mode (VOR-PAR) and an RNAV approach mode (RNAV-APR). The same rotary MODE selector knob is used to place the unit in either of these secondary modes.

All waypoint information (station frequency, waypoint distance and waypoint radial) is entered with the increment/decrement rotary switch on the right side of the panel and displayed in their respective displays. The small knob affects the least significant digits while the large knob changes the most significant digits. The tenth's position of waypoint radial and distance can be changed by pulling the small knob to the out position. The type of data being selected is indicated by the illuminated carets (><) located

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by either FRQ, RAD or DST. Frequency, radial or distance information for a waypoint can be selected sequentially by pressing the DATA push button. The increment/decrement switch changes only the information being displayed with the carets.

The KNS-81 can store frequency, radial and distance information for up to nine waypoints. The waypoint number of the data being displayed is located above the message WPT. This waypoint number is changed by rotating the WPT selector knob (small center knob) on the left side of the panel. If the waypoint in use is different from the displayed Waypoint (WPT blinking), pressing the USE button will cause the displayed WPT to become the waypoint in use.

## **DISPLAYS**

### **1. FRQ, RAD, DST Display**

#### **a. FRQ Display**

Displays frequency from 108.00 to 117.95 MHz in increments of .05 MHz. Least significant digit displays only zero or five.

#### **b. RAD Display**

Displays ground station radial on which waypoint is located from 0.0 to 359.9 degrees.

#### **c. DST Display**

Displays the offset distance of the waypoint from the ground station over a range of 0.0 to 199.9 NM.



## 2. VOR, PAR, RNAV, RNAV-APR Displays

System mode lights

## 3. WPT Display

■ Displays waypoint number of data being displayed.

## 4. Carets (><) Display

Indicates which waypoint data (FRQ, RAD or DST) the increment/decrement rotary switch will change.

## 5. DME Indicator (Remote)

Displays NM to/from the waypoint/station, KT groundspeed and MIN time to the waypoint/station. Also, the waypoint radial is displayed whenever the KNS-81 RAD Button is pressed.

## 6. RMI Display (Optional)

Displays the bearing to the waypoint/station.

## CONTROLS

### 1. WPT/MODE Control

Dual concentric knobs.

- a. The outer knob selects the MODE of unit operation. Turning the knob clockwise causes the mode to sequence thru VOR, VOR-PAR, RNAV, RNAV-APR and then back to the VOR mode.

- b. The center knob selects the WPT to be displayed. Turning the knob causes the displayed waypoint to increment by one thru the waypoint sequence of 1, 2, . . . . 8, 9, 1, or on later models 0, 1, . . . . 8, 9, 0.

## **2. USE Button**

Momentary pushbutton which, when pressed, causes the active waypoint to take on the same value as the displayed waypoint.

## **3. RTN Button**

Momentary pushbutton which, when pressed, causes the active waypoint to return to the display.

## **4. RAD Button**

Push-on, push-off button which, when pushed on, causes the radial from the waypoint and "F" to be displayed on the remote DME display.

## **5. CHK Button**

Momentary pushbutton which, when pressed, causes the raw data from the NAV Receiver and DME to be displayed. The radial from the VOR Ground Station will be displayed on the RAD display and the distance from the station will be displayed on the DST display. There is no effect on any other data output.

## **6. DATA Button**

Momentary pushbutton which, when pressed, causes the caret (><) display to change from FRQ to RAD to DST and back to FRQ.

## 7. OFF/PULL ID Control

Rotary switch/potentiometer which, when turned clockwise, applies power to the KNS-81 and increases NAV audio level. The switch may be pulled out to hear VOR ident.

## 8. DATA INPUT Control

Dual concentric knobs with the center knob having an "in" and "out" position.

### a. Frequency Data

The outer knob varies the 1 MHz and 10 MHz digits and the center knob varies the frequency in .05 MHz increments which carry to/from the .1 MHz digit regardless of whether the switch is in its "in" or "out" position.

### b. Radial Data

The outer knob varies the 10 degree digit with a carryover occurring from the tens to hundreds position. The center knob in the "in" position varies the 1 degree digit and in the "out" position varies the 0.1 degree digit.

### c. Distance Data

The outer knob varies the 10 NM digit with a carryover occurring from the tens to hundreds place. The center knob in the "in" position varies the 1 NM digit and in the "out" position varies the 0.1 NM digit.

**HANDLING, SERVICE AND MAINTENANCE - No change**

Approved: 



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

**BEECHCRAFT BARON 95-B55, 95-B55A, E55, E55A, 58,  
58A, 58P, 58PA, 58TC, and 58TCA LANDPLANES**

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

for the

**COLLINS ANS-351 AREA NAVIGATION SYSTEM**

**GENERAL**

The information in this supplement is FAA approved material and must be attached to the *Pilot's Operating Handbook and FAA Approved Airplane Flight Manual* when the airplane has been modified by installation of the Collins ANS-351 Area Navigation System in accordance with Beech FAA Approved Data.

The information in this supplement supersedes or adds to the basic *Pilot's Operating Handbook and FAA Approved Airplane Flight Manual* only as set forth within this document. Users of the manual are advised always to refer to the supplement for possibly superseding information and placarding applicable to operation of the airplane.

**LIMITATIONS**

1. The Area Navigation function may not be used as a primary system under IFR conditions except on approved approach procedures, approved area navigation airways, and random area navigation routes when approved by Air Traffic Control.

2. The Area Navigation function can only be used with co-located facilities. (VOR and DME signals originate from the same geographical location.)
3. The maximum distance for waypoint location is 199 nautical miles from the VOR/DME facility.
4. Approach mode should be restricted to distances of 50 nautical miles or less from the waypoint in use.

## **EMERGENCY PROCEDURES**

### *CAUTION*

DME may unlock due to loss of signal with certain combinations of distance from station, altitude and angle of bank.

1. If NAV flag appears while in the enroute mode, check for correct frequency.
2. If VOR or DME equipment is intermittent or lost, utilize other navigation equipment as required.
3. If NAV flag appears during an approach, execute published missed approach and utilize another approved facility.

## **NORMAL PROCEDURES**

1. NAV receivers - ON
2. Presetting waypoints on the ground:

## NOTE

When power is first applied to the ANS-351 and the system is in the RNAV mode, WPT 1 will be active and waypoint bearing and distance indicators will read zero.

- a. WPT 1 coordinates are set into the ANS-351 using the concentric knobs under the bearing and distance display fields.
  - b. The waypoint selection knob is then rotated to select WPT 2. Note that the waypoint number is blinking, indicating that the waypoint is inactive at this point. WPT 2 bearing and distance definitions are then set into the ANS-351.
  - c. Set up the rest of the desired waypoints as described above. The ANS-351 has memory capacity for 8 waypoints.
  - d. Press the RTN (return) push button to display the active waypoint.
3. Changing waypoints in flight:
- a. Select heading mode on the autopilot if engaged.
  - b. Rotate the waypoint selector until the desired waypoint number and coordinates are displayed.
  - c. Verify that the new waypoint definition is correct by comparing the display to the flight plan.

## **NORMAL PROCEDURES (Cont.)**

- d. Select the desired reference frequency on the associated navigation receiver and positively identify by listening to the "ident" tone.
  - e. Select the desired course on the OBS (Omni Bearing Selector).
  - f. Press the USE button on the ANS-351 and note that the waypoint identification number stops blinking.
  - g. Select the NAV mode on the autopilot after the deviation and distance-to-waypoint indications have stabilized.
4. Presetting waypoints in flight (RNAV mode):

Waypoints may be preset in flight without disturbing the navigational outputs.

- a. Rotate the waypoint selector knob to display the waypoint number to be preset. Note blinking waypoint number.
  - b. Set into the ANS-351 the desired waypoint bearing and distance.
  - c. Press the RTN (return) push button and note that the presently used waypoint is displayed.
5. Presetting waypoint in flight (VOR/LOC modes):

If the system is in VOR or LOC mode the ANS-351 will annunciate these modes on the display.



- a. Rotate the waypoint selector knob and note that the VOR or LOC annunciator is replaced by waypoint number, bearing, and distance. The waypoint number will always be blinking and the USE push button will be inactive.
- b. Preset the waypoint bearing and distances.
- c. Press the RTN (return) push button and observe the annunciation of VOR or LOC on the ANS-351 panel.

## **PERFORMANCE**

No change.

## **SYSTEM DESCRIPTION**

1. Navigation System Mode Control - A four position switch, located on the instrument panel or DME control head, is used to select the navigational mode of operation, either RNAV or VOR.
2. The Collins DME indicator used with the computer in the RNAV mode displays distance to the active waypoint in nautical miles, time to the waypoint in minutes, and all angle ground speed in knots (i.e. the airplane does not have to be on a course directly to a waypoint to display a valid groundspeed). A green annunciator light on the indicator is illuminated any time the system is in the RNAV mode and power is applied to the NAV receiver.

## SYSTEM DESCRIPTION (Cont.)

After initiating the RNAV mode, always observe the ground speed over a period of 2 minutes or more to ensure that the indication has reached a steady-state value.

### 3. ANS-351 Area Navigation Computer

- a. Collins Mode Control (ENR/APPR) - Use of this control allows selection of either ENR (enroute) or APPR (approach) modes of operation. In the enroute mode the course deviation is 5 nautical miles full scale. In the approach mode the course deviation is 1.25 nautical miles full scale deflection of the CDI, (Course Deviation Indicator).
- b. Waypoint Selector (WPT) - Sequences display waypoints from 1 through 8. Winking waypoint number indicates nonactive waypoints; steadily on waypoint number indicates the active waypoint.
- c. Radial Selector - Two concentric knobs can be used to set radial information into the display. Knobs control information as follows:
  - Large knob: Changes display in 10-degree increments.
  - Small knob, pushed in: Changes display in 1-degree increments.
  - Small knob, pulled out: Changes display in 0.1-degree increments.

- d. Distance Selector - Two concentric control knobs can be used to set distance information in nautical miles into the display.

Knobs control information as follows:

Large knob: Changes the display in 10-nautical mile increments.

Small knob, pushed in: Changes the display in 1-nautical mile increments.

Small knob, pulled out: Changes the display in 0.1-nautical mile increments from 00.0 through 100 miles. Beyond 100 NM, changes the display in 1-mile increments.

- e. Return Button (RTN) - Pressing RTN returns the display to the active waypoint when a nonactive waypoint is currently being displayed.
- f. Use Button (USE) - Pressing the USE button converts the waypoint being displayed into the active waypoint.
- g. Check Button (CHK) - Pressing the CHK button causes normal slant range DME distance to the VOR/DME station to be presented on the DME indicator. The WPT annunciator on the DME indicator will extinguish during this time. If TO or FROM is selected on the Collins NAV receiver, the magnetic bearing to or from

## SYSTEM DESCRIPTION (Cont.)

the VOR/DME station will be displayed. The WPT annunciator light on the NAV receiver will extinguish during the time the CHK button is held down. If an RMI is installed, and is compatible with the ANS-351, pressing the check button will cause the bearing pointer to indicate the bearing to the active VOR station. RNAV computation, CDI deviation, TO/FROM display, and autopilot tracking of RNAV path remain unaffected. The check button is spring loaded to prevent prolonged actuation.

- h. Ambient Light Sensor - Automatically adjusts display lighting intensity as a function of cockpit ambient light.
4. Collins Navigation Receiver (NAV).
- a. OFF - Controls power to the NAV receiver and to the Area Navigation Computer.
  - b. FREQ - Allows the selection of VOR and Localizer frequencies.
  - c. TO - Displays airplane magnetic bearing to the VOR station in the normal mode and airplane magnetic bearing to the waypoint in the RNAV mode.
  - d. FROM - Displays airplane magnetic bearing from the VOR station in the normal mode, and airplane bearing from the waypoint in the RNAV mode.
  - e. WPT Annunciator - Light is illuminated any time the NAV receiver is on, the RNAV mode

is selected, and CHK button is not depressed.

- f. Ambient Light Sensor - Automatically adjusts display lighting intensity as a function of cockpit ambient light.

5. CDI (Course Deviation Indicator)

- a. Operation of the CDI in the RNAV mode differs from the operation in the VOR mode as follows:
  - 1. Indicator movement represents a linear deviation from the selected course.
  - 2. In the enroute mode, full scale deviation is 5 NM. In the approach mode, the full scale deflection is 1.25 NM.
  - 3. An annunciator light on the instrument panel illuminates any time power is applied to the NAV receivers and the system is in the RNAV mode.

6. RMI Bearing

An output is provided by the ANS-351 that allows an RMI with built-in NAV converter to display bearing to or from the waypoint while operating in the RNAV mode. (NOTE: (An RMI may or may not be installed to work in conjunction with the RNAV computer).

Approved:

*for*   
Chester A. Rembleske  
Beech Aircraft Corporation  
DOA CE-2

**FAA Approved**  
**Issued: November 16, 1977**  
**P/N 106-590000-15**

Page 1 of 1  
FAA APPROVED  
DATE 9/10/71  
Revised: 8/30/73  
Revised: 2/13/76

HARTZELL PROPELLER, INC.  
350 WASHINGTON AVE.  
PIQUA, OHIO  
FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT  
FOR  
BEECH MODELS 95-55, 95-A55, 95-B55, 95-B55A, & 95-B55B  
WITH HARTZELL PROPELLERS PER STC SA795CE

REG. NO. \_\_\_\_\_

SER. NO. \_\_\_\_\_

THIS DOCUMENT MUST BE ATTACHED TO THE FAA APPROVED AIRPLANE FLIGHT MANUAL WHEN HARTZELL PROPELLERS ARE INSTALLED PER STC SA795CE. INFORMATION CONTAINED HEREIN SUPPLEMENTS OR SUPERSEDES CORRESPONDING INFORMATION IN THE BASIC AIRPLANE FLIGHT MANUAL.

I. LIMITATIONS

C. PROPELLERS:

1. Hartzell constant-speed, three-bladed propeller (85 lbs. @ Station +18, or 89 lbs. for propellers designated "U").  
Hubs: PHC-C3YF-2 or PHC-C3YF-2F or PHC-C3YF-2U or PHC-C3YF-2UF  
Blades: C7663-2R or FC7663-2R  
Spinner: C-3567-1 (5 lb. @ Station +18)  
Governor: Woodward 210355, B210438 or 210666  
Pitch Settings at 30 inch station: Low 13.5° - High 84°  
Diameter: Not over 76 inches, not under 74.5 inches.

OR

2. Hartzell constant-speed, two-bladed propeller (62 lbs. @ Station +18, or 66 lbs. for propellers designated "U").  
Hubs: BHC-C2YF-2CH or BHC-C2YF-2CHU or DHC-C2YF-2CH or DHC-C2YF-2CHU or BHC-C2YF-2CHF or BHC-C2YF-2CHUF or DHC-C2YF-2CHF or DHC-C2YF-2CHUF  
Blades: C8465-6 or FC8465-6  
Spinners: C-2285-1 or C-2285-6 (5 lbs. @ Station +18)  
Governor: Woodward 210355, B210438 or 210666  
Pitch Settings at 30 inch station: Low 16.0° - High 80°  
Diameter: Not over 78 inches, not under 76.5 inches.

FAA APPROVED

FOR

*Richard A. Paul*  
Keith D. Anderson, Chief  
Eng. & Mfg. Br. Great Lakes Region  
Des Plaines, Illinois  
Date: 2/13/76

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## **INTRODUCTION**

Beech Aircraft Corporation has developed this special summary publication of safety information to refresh pilots' and owners' knowledge of safety related subjects. Topics in this publication are dealt with in more detail in FAA Advisory Circulars and other publications pertaining to the subject of safe flying.

The skilled pilot recognizes that safety consciousness is an integral - and never-ending - part of his or her job. Be thoroughly familiar with your airplane. Know its limitations and your own. Maintain your currency, or fly with a qualified instructor until you are current and proficient. Practice emergency procedures at safe altitudes and airspeeds, preferably with a qualified instructor pilot, until the required action can be accomplished without reference to the manual. Periodically review this Safety Information as part of your recurrency training regimen.

BEECHCRAFT airplanes are designed and built to provide you with many years of safe and efficient transportation. By maintaining your BEECHCRAFT properly and flying it prudently you will realize its full potential.

..... Beech Aircraft Corporation

**WARNING**

Because your airplane is a high performance, high speed transportation vehicle, designed for operation in a three-dimensional environment, special safety precautions must be observed to reduce the risk of fatal or serious injuries to the pilot(s) and occupant(s).

It is mandatory that you fully understand the contents of this publication and the other operating and maintenance manuals which accompany the airplane; that FAA requirements for ratings, certifications and review be scrupulously complied with; and that you allow only persons who are properly licensed and rated, and thoroughly familiar with the contents of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual to operate the airplane.

**IMPROPER OPERATION OR MAINTENANCE OF AN AIRPLANE, NO MATTER HOW WELL BUILT INITIALLY, CAN RESULT IN CONSIDERABLE DAMAGE OR TOTAL DESTRUCTION OF THE AIRPLANE, ALONG WITH SERIOUS OR FATAL INJURIES TO ALL OCCUPANTS.**

## **GENERAL**

As a pilot, you are responsible to yourself and to those who fly with you, to other pilots and their passengers and to people on the ground, to fly wisely and safely.

The following material in this Safety Information publication covers several subjects in limited detail. Here are some condensed Do's and Don'ts.

### **DO'S**

Be thoroughly familiar with your airplane, know its limitations and your own.

Be current in your airplane, or fly with a qualified instructor until you are current. Practice until you are proficient.

Preplan all aspects of your flight - including a proper weather briefing and adequate fuel reserves.

Use services available - weather briefing, inflight weather and Flight Service Station.

Carefully preflight your airplane.

Use the approved checklist.

Have more than enough fuel for takeoff, plus the trip, and an adequate reserve.

Be sure your weight loading 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.

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 fuel tanks for take off or landing.

Practice emergency procedures at safe altitudes and air-speeds, preferably with a qualified instructor pilot, until the required action is instinctive.

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 unless the airplane is approved, properly equipped, and all required equipment is operational for flight in 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 Flight Manual, 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

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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 BEEHCRAFT 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 BEEHCRAFT 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 BEEHCRAFT 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 BEEHCRAFT 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

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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  
Enroute - 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

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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:

|               |                                                                                                                                          |
|---------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>*00-6</b>  | Aviation Weather                                                                                                                         |
| <b>00-24</b>  | Thunderstorms                                                                                                                            |
| <b>00-30</b>  | Rules of Thumb for Avoiding or Minimizing Encounters with Clear Air Turbulence                                                           |
| <b>*00-45</b> | Aviation Weather Services                                                                                                                |
| <b>00-46</b>  | Aviation Safety Reporting Program                                                                                                        |
| <b>20-5</b>   | Plane Sense                                                                                                                              |
| <b>20-32</b>  | Carbon Monoxide (CO) Contamination in Aircraft - Detection and Prevention                                                                |
| <b>20-35</b>  | Tie-Down Sense                                                                                                                           |
| <b>20-43</b>  | Aircraft Fuel Control                                                                                                                    |
| <b>20-105</b> | Engine-Power Loss Accident Prevention                                                                                                    |
| <b>20-113</b> | Pilot Precautions and Procedures to be Taken in Preventing Aircraft Reciprocating Engine Induction System and Fuel System Icing Problems |
| <b>20-125</b> | Water in Aviation Fuels                                                                                                                  |
| <b>21-4</b>   | Special Flight Permits for Operation of Overweight Aircraft                                                                              |
| <b>43-9</b>   | Maintenance Records: General Aviation Aircraft                                                                                           |

|               |                                                                                                              |
|---------------|--------------------------------------------------------------------------------------------------------------|
| <b>43-12</b>  | <b>Preventive Maintenance</b>                                                                                |
| <b>60-4</b>   | <b>Pilot's Spatial Disorientation</b>                                                                        |
| <b>60-6</b>   | <b>Airplane Flight Manuals (AFM),<br/>Approved Manual Materials, Markings<br/>and Placards - Airplanes</b>   |
| <b>60-12</b>  | <b>Availability of Industry-Developed<br/>Guidelines for the Conduct of the Bien-<br/>nial Flight Review</b> |
| <b>60-13</b>  | <b>The Accident Prevention Counselor<br/>Program</b>                                                         |
| <b>*61-9</b>  | <b>Pilot Transition Courses for Complex<br/>Single-Engine and Light Twin-Engine<br/>Airplanes</b>            |
| <b>*61-21</b> | <b>Flight Training Handbook</b>                                                                              |
| <b>*61-23</b> | <b>Pilot's Handbook of Aeronautical<br/>Knowledge</b>                                                        |
| <b>*61-27</b> | <b>Instrument Flying Handbook</b>                                                                            |
| <b>61-67</b>  | <b>Hazards Associated with Spins in Air-<br/>planes Prohibited from Intentional<br/>Spinning.</b>            |
| <b>61-84</b>  | <b>Role of Preflight Preparation</b>                                                                         |
| <b>*67-2</b>  | <b>Medical Handbook for Pilots</b>                                                                           |
| <b>90-23</b>  | <b>Aircraft Wake Turbulence</b>                                                                              |
| <b>90-42</b>  | <b>Traffic Advisory Practices at Nontower<br/>Airports</b>                                                   |
| <b>90-48</b>  | <b>Pilot's Role in Collision Avoidance</b>                                                                   |
| <b>90-66</b>  | <b>Recommended Standard Traffic Pat-<br/>terns for Airplane Operations at<br/>Uncontrolled Airports</b>      |

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| <b>90-85</b>  | <b>Severe Weather Avoidance Plan (SWAP)</b>                                                   |
| <b>91-6</b>   | <b>Water, Slush and Snow on the Runway</b>                                                    |
| <b>91-13</b>  | <b>Cold Weather Operation of Aircraft</b>                                                     |
| <b>*91-23</b> | <b>Pilot's Weight and Balance Handbook</b>                                                    |
| <b>91-26</b>  | <b>Maintenance and Handling of Air Driven Gyroscopic Instruments</b>                          |
| <b>91-33</b>  | <b>Use of Alternate Grades of Aviation Gasoline for Grade 80/87</b>                           |
| <b>91-35</b>  | <b>Noise, Hearing Damage, and Fatigue in General Aviation Pilots</b>                          |
| <b>91-43</b>  | <b>Unreliable Airspeed Indications</b>                                                        |
| <b>91-44</b>  | <b>Operational and Maintenance Practices for Emergency Locator Transmitters and Receivers</b> |
| <b>91-46</b>  | <b>Gyroscopic Instruments - Good Operating Practices</b>                                      |
| <b>91-50</b>  | <b>Importance of Transponder Operations and Altitude Reporting</b>                            |
| <b>91-51</b>  | <b>Airplane Deice and Anti-ice Systems</b>                                                    |
| <b>91-59</b>  | <b>Inspection and Care of General Aviation Aircraft Exhaust Systems</b>                       |
| <b>91-65</b>  | <b>Use of Shoulder Harness in Passenger Seats</b>                                             |
| <b>103-4</b>  | <b>Hazards Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft</b>  |
| <b>135-9</b>  | <b>FAR Part 135 Icing Limitations</b>                                                         |

**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  
Flying Light Twins Safely  
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 of 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 BEEHCRAFT or BEEHCRAFT approved parts obtained from BEEHCRAFT approved sources, in connection with the maintenance and repair of Beech airplanes.

Genuine BEEHCRAFT 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 BEEHCRAFT, 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.

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

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

Airplanes operated for Air Taxi or other than normal operation, and airplanes operated in humid tropics, or cold and damp climates, etc., may need more frequent inspections for wear, corrosion and/or lack of lubrication. In these areas, periodic inspections should be performed until the operator can set his own inspection periods based on experience.

**NOTE**

The required periods do not constitute a guarantee that the item will reach the period without malfunction, as the aforementioned factors cannot be controlled by the manufacturer.

Corrosion and its effects must be treated at the earliest possible opportunity. A clean, dry surface is virtually immune to corrosion. Make sure that all drain holes remain unobstructed. Protective films and sealants help to keep corrosive agents from contacting metallic surfaces. Corrosion inspections should be made most frequently under high-corrosion-risk operating conditions, such as in areas of



excessive airborne salt concentrations (e.g., near the sea) and in high-humidity areas (e.g., tropical regions).

If you have purchased a used airplane, have your mechanic inspect the airplane registration records, logbooks and maintenance records carefully. An unexplained period of time for which the airplane has been out of service, or unexplained significant repairs may well indicate the airplane has been seriously damaged in a prior accident. Have your mechanics inspect a used airplane carefully. Take the time to ensure that you really know what you are buying when you buy a used airplane.

## **HAZARDS OF UNAPPROVED MODIFICATIONS**

Many airplane modifications are approved under Supplemental Type Certificates (STC's). Before installing an STC on your airplane, check to make sure that the STC does not conflict with other STC's that have already been installed. Because approval of an STC is obtained by the individual STC holder based upon modification of the original type design, it is possible for STC's to interfere with each other when both are installed. Never install an unapproved modification of any type, however innocent the apparent modification may seem. Always obtain proper FAA approval.

Airplane owners and maintenance personnel are particularly cautioned not to make attachments to, or otherwise modify, seats from original certification without approval from the FAA Engineering and Manufacturing District Office having original certification responsibility for that make and model.

Any unapproved attachment or modification to seat structure may increase load factors and metal stress which could cause failure of seat structure at a lesser "G" force than exhibited for original certification.

Examples of unauthorized attachments found are drilling holes in seat tubing to attach fire extinguishers and drilling holes to attach approach plate book bins to seats.

## **FLIGHT PLANNING**

FAR Part 91 requires that each pilot in command, before beginning a flight, familiarize himself with all available information concerning that flight.

Obtain a current and complete preflight briefing. This should consist of local, enroute and destination weather and enroute navaid information. Enroute terrain and obstructions, alternate airports, airport runways active, length of runways, and takeoff and landing distances for the airplane for conditions expected should be known.

The prudent pilot will review his planned enroute track and stations and make a list for quick reference. It is strongly recommended a flight plan be filed with Flight Service Stations, even though the flight may be VFR. Also, advise Flight Service Stations of changes or delays of one hour or more and remember to close the flight plan at destination.

The pilot must be completely familiar with the performance of the airplane and performance data in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. The resultant effect of temperature and pressure altitude must be taken into account in performance if not accounted for on the charts. An applicable FAA Approved Airplane Flight Manual must be aboard the airplane at all times and include the weight and balance forms and equipment list.

## **PASSENGER INFORMATION CARDS**

Beech has available, for most current production airplanes, passenger information cards which contain important information on the proper use of restraint systems, oxygen

masks, emergency exits and emergency bracing procedures. Passenger information cards may be obtained at any BEECHCRAFT Authorized Outlet. A pilot should not only be familiar with the information contained in the cards, but should always, prior to flight, inform the passengers of the information contained in the information cards. The pilot should orally brief the passengers on the proper use of restraint systems, doors and emergency exits, and other emergency procedures, as required by Part 91 of the FAR's.

## **STOWAGE OF ARTICLES**

The space between the seat pan and the floor is utilized to provide space for seat displacement. If hard, solid objects are stored beneath seats, the energy absorbing feature is lost and severe spinal injuries can occur to occupants.

Prior to flight, pilots should insure that articles are not stowed beneath seats that would restrict seat pan energy absorption or penetrate the seat in event of a high vertical velocity accident.

## **FLIGHT OPERATIONS**

### ***GENERAL***

The pilot **MUST** be thoroughly familiar with **ALL INFORMATION** published by the manufacturer concerning the airplane, and is required by law to operate the airplane in accordance with the FAA Approved Airplane Flight Manual and placards installed.

### ***PREFLIGHT INSPECTION***

In addition to maintenance inspections and preflight information required by FAR Part 91, a complete, careful preflight inspection is imperative.

Each airplane has a checklist for the preflight inspection which must be followed. **USE THE CHECKLIST.**

### ***WEIGHT AND BALANCE***

Maintaining center of gravity within the approved envelope throughout the planned flight is an important safety consideration.

The airplane must be loaded so as not to exceed the weight and center of gravity (C.G.) limitations. Airplanes that are loaded above the maximum takeoff or landing weight limitations will have an overall lower level of performance compared to that shown in the Performance section of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. If loaded above maximum takeoff weight, takeoff distance and the landing distance will be longer than that shown in the Performance section; the stalling speed will be higher, rate of climb, the cruising speed, and the range of the airplane at any level of fuel will all be lower than shown in the Performance section.

If an airplane is loaded so that the C.G. is forward of the forward limit it will require additional control movements for maneuvering the airplane with correspondingly higher control forces. The pilot may have difficulty during takeoff and landing because of the elevator control limits.

If an airplane is loaded aft of the aft C.G. limitation, the pilot will experience a lower level of stability. Airplane characteristics that indicate a lower stability level are; lower control forces, difficulty in trimming the airplane, lower control forces for maneuvering with attendant danger of structural overload, decayed stall characteristics, and a lower level of lateral-directional damping.

Ensure that all cargo and baggage is properly secured before takeoff. A sudden shift in balance at rotation can cause controllability problems.

## ***AUTOPILOTS AND ELECTRIC TRIM SYSTEMS***

Because there are several different models of autopilots and electric trim systems installed in Beech airplanes and different installations and switch positions are possible from airplane to airplane, it is essential that every owner/operator review his Airplane Flight Manual (AFM) Supplements and ensure that the supplements properly describe the autopilot and trim installations on his specific airplane. Each pilot, prior to flight, must be fully aware of the proper procedures for operation, and particularly disengagement, for the system as installed.

In addition to ensuring compliance with the autopilot manufacturer's maintenance requirements, all owners/operators should thoroughly familiarize themselves with the operation, function and procedures described in the Airplane Flight Manual Supplements. Ensure a full understanding of the methods of engagement and disengagement of the autopilot and trim systems.

Compare the descriptions and procedures contained in the Supplements to the actual installation in the airplane to ensure that the supplement accurately describes your installation. Test that all buttons, switches and circuit breakers function as described in the Supplements. If they do not function as described, have the system repaired by a qualified service agency. If field service advice or assistance is necessary, contact Beech Aircraft Corporation, Customer Support Department.

As stated in all AFM Supplements for autopilot systems and trim systems installed on Beech airplanes, the preflight check must be conducted before every flight. The preflight check assures not only that the systems and all of their features are operating properly, but also that the pilot, before flight, is familiar with the proper means of engagement and disengagement of the autopilot and trim system.

Autopilot Airplane Flight Manual Supplements caution against trying to override the autopilot system during flight without disengaging the autopilot because the autopilot will continue to trim the airplane and oppose the pilot's actions. This could result in a severely out of trim condition. This is a basic feature of all autopilots with electric trim follow-up.

Do not try to manually override the autopilot during flight.

**IN CASE OF EMERGENCY, YOU CAN OVERPOWER THE AUTOPILOT TO CORRECT THE ATTITUDE, BUT THE AUTOPILOT AND ELECTRIC TRIM MUST THEN IMMEDIATELY BE DISENGAGED.**

It is often difficult to distinguish an autopilot malfunction from an electric trim system malfunction. The safest course is to deactivate both. Do not re-engage either system until after you have safely landed. Then have the systems checked by a qualified service facility prior to further flight.

Depending upon the installation on your airplane, the following additional methods may be available to disengage the autopilot or electric trim in the event that the autopilot or electric trim does not disengage utilizing the disengage methods specified in the Supplements.

**CAUTION**

Transient control forces may occur when the autopilot is disengaged.

1. Turn off the autopilot master switch, if installed.
2. Pull the autopilot and trim circuit breaker(s) or turn off the autopilot switch breaker, if installed.
3. Turn off the RADIO MASTER SWITCH, if installed, and

if the autopilot system and the trim system are wired through this switch.

**CAUTION**

Radios, including VHF COMM are also disconnected when the radio master switch is off.

4. Turn off the ELECTRIC MASTER SWITCH.

**WARNING**

Most 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

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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. Pilots 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. IMMEDIATELY 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 en route 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:

| <b>Class of Turbulence</b> | <b>Effect</b>                                                                                                                                            |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Extreme</b>             | Airplane is violently tossed about and is practically impossible to control. May cause structural damage.                                                |
| <b>Severe</b>              | Airplane may be momentarily out of control. Occupants are thrown violently against the belts and back into the seat. Unsecured objects are tossed about. |
| <b>Moderate</b>            | 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.

## *FLIGHT IN ICING CONDITIONS*

Every pilot should be intimately acquainted with the FAA Approved National Weather Service definitions for ice intensity and accumulation which we have reprinted below:

| <b>Intensity</b> | <b>Ice Accumulation</b>                                                                                                                                                                                                                                          |
|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Trace</b>     | Ice becomes perceptible. Rate of accumulation slightly greater than rate of sublimation. It is not hazardous even though deicing/anti-icing equipment is not utilized, unless encountered for an extended period of time (over 1 hour).                          |
| <b>Light</b>     | The rate of accumulation may create a problem if flight is prolonged in this environment (over 1 hour). Occasional use of deicing/anti-icing equipment removes/prevents accumulation. It does not present a problem if the deicing/anti-icing equipment is used. |
| <b>Moderate</b>  | The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or diversion is necessary.                                                                                                      |
| <b>Severe</b>    | The rate of accumulation is such that deicing/anti-icing equipment fails to reduce or control the hazard. Immediate diversion is necessary.                                                                                                                      |

It is no longer unusual to find deicing and anti-icing equipment on a wide range of airplane sizes and types. Since the capability of this equipment varies, it becomes the pilot's primary responsibility to understand limitations which restrict the use of his airplane in icing conditions and the conditions which may exceed the systems capacity.

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Pilots and airplane owners must carefully review the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual in order to ascertain the required operable equipment needed for flight in icing conditions. In addition, they must ascertain from the same source the limits of approval or certification of their airplane for flight in icing conditions, and plan the flight accordingly, if icing conditions are known or forecast along the route.

Every owner and pilot of an airplane should understand that it is not uncommon to find airplanes equipped with less than the full complement of available systems and equipment. For example, propellers and pitot tube may be protected, but the airplane may not have wing boots or tail boots. The reverse might be true. Windshield, pitot and airfoil surfaces might be protected, but the propellers might not be. Before undertaking any flight into areas where icing conditions might be expected, inspect the airplane and review the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual to be certain that you are supported by the full complement of required IFR and deicing/anti-icing equipment.

Remember that regardless of its combination of deicing/anti-icing equipment, any airplane not fully equipped and functional for IFR flight is not properly equipped for flight in icing conditions. An airplane which is not approved or certificated for flight in icing conditions, or which does not have all critical areas protected in the required manner by fully operational anti-icing equipment must not be exposed to icing encounters of any intensity. When icing is detected, the pilot of such an airplane must make an immediate diversion by flying out of the area of visible moisture or going to an altitude where icing is not encountered.

Some models of Beech airplanes were approved for flight in certain limited icing conditions under the FAA's Bureau of Flight Standards Release No. 434. Under this release, properly equipped airplanes are approved for flight in light to

moderate icing conditions only. Refer to Sections 2 and 4 of the above document for icing limitations. These airplanes are not approved for extended flight in moderate icing conditions or flights in any severe icing conditions. Flight in these conditions must be avoided.

Even airplanes fully equipped and certified for flight in the icing conditions described in Appendix C to FAR Part 25 must avoid flights into those conditions defined by the National Weather Service as "Severe". The National Weather Service definition of "Severe Icing" describes that conditions as: "the rate of accumulation is such that deicing/anti-icing equipment fails to reduce or control the hazard." No airplane equipped with any combination of deicing/anti-icing equipment can be expected to cope with such conditions. As competent pilots know, there appears to be no predictable limits for the severest weather conditions. For essentially the same reasons that airplanes, however designed or equipped for IFR flight, cannot be flown safely into conditions such as thunderstorms, tornadoes, hurricanes or other phenomena likely to produce severe turbulence, airplanes equipped for flight in icing conditions cannot be expected to cope with "Severe" icing conditions as defined by the National Weather Service. The prudent pilot must remain alert to the possibility that icing conditions may become "severe" and that his equipment will not cope with them. At the first indication that such condition may have been encountered or may lie ahead, he should immediately react by selecting the most expeditious and safe course for diversion.

Every pilot of a properly fully-equipped Beech airplane who ventures into icing conditions must maintain the minimum speed (KIAS) for operation in icing conditions, which is set forth in the Normal Procedures section, and in the Limitations section, of his Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. If a minimum speed for flight in icing conditions is not specified in the manual, the following minimum indicated airspeeds must be maintained:

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All other BEECHCRAFT twin-engine models - 140 KIAS

The pilot must remain aware of the fact that if he allows his airspeed to deteriorate below this minimum speed, he will increase the angle of attack of his airplane to the point where ice may build up on the under side of the wings aft of the area protected by the boots.

The fact or extent of ice build-up in unprotected areas will not be directly observable from the cockpit. Due to distortion of the wing airfoil, increased drag and reduced lift, stalling speeds will increase as ice accumulates on the airplane. For the same reasons, stall warning devices are not accurate and cannot be relied upon in icing conditions.

Even though the pilot maintains the prescribed minimum speeds for operating in icing conditions, ice is still likely to build up on the unprotected areas (the fuselage and unprotected wing leading edge inboard of the engine nacelle). Under some atmospheric conditions, it may even build up aft of the boots despite the maintenance of the prescribed minimum speed. The effect of ice accumulation on any unprotected surface is aggravated by length of exposure to the icing conditions. Ice buildup on unprotected surfaces will increase drag, add weight, reduce lift, and generally, adversely affect the aerodynamic characteristics and performance of the airplane. It can progress to the point where the airplane is no longer capable of flying. Therefore, the pilot operating even a fully-equipped airplane in sustained icing conditions must remain sensitive to any indication, such as observed ice accumulation, loss of airspeed, the need for increased power, reduced rate of climb, or sluggish response, that ice is accumulating on unprotected surfaces and that continued flight in these conditions is extremely hazardous, regardless of the performance of the deicing/anti-icing equipment.



Since flight in icing conditions is not an everyday occurrence, it is important that pilots maintain a proper proficiency and awareness of the operating procedures necessary for safe operation of the airplane and that the airplane is in a condition for safe operation.

Ensure moisture drains in the airplane structure are maintained open as specified in the Aircraft Maintenance Manual, so that moisture will not collect and cause freezing in the control cable area. Also, control surface tab hinges should be maintained and lubricated as specified in the Aircraft Maintenance Manual.

In icing conditions the autopilot should be disengaged at an altitude sufficient to permit the pilot to gain the feel of the airplane prior to landing. In no case should this be less than the minimum altitude specified in the Autopilot Airplane Flight Manual Supplement.

Observe the procedures set forth in your Pilot's Operating Handbook and FAA Approved Airplane Flight Manual during operation in icing conditions.

Activate your deice and anti-icing systems before entering an area of moisture where you are likely to go through a freezing level, to make sure all necessary equipment is operative.

Rapid cycling of deice boots or cycling before at least one-half inch (1/2") of ice has accumulated (measured in the chordwise direction or forward from the leading edge), may cause the ice to grow outside the contour of the inflated boots and prevent ice removal.

For any owner or pilot whose use pattern for an airplane exposes it to icing encounters, the following references are required reading for safe flying:

- The airplane's Pilot's Operating Handbook and FAA

Approved Airplane Flight Manual, especially the sections on Normal Procedures, Emergency Procedures, Abnormal Procedures, Systems, and Safety Information.

- FAA Advisory Circulars 91-51 Airplane Deice and Anti-ice Systems
- FAA Advisory Circulars 135-9 - Icing Limitations
- Weather Flying by Robert N. Buck.

Finally, the most important ingredients to safe flight in icing conditions - regardless of the airplane or the combination of deicing/anti-icing equipment - are a complete and current weather briefing, sound pilot judgement, close attention to the rate and type of ice accumulations, and the knowledge that "severe icing" as defined by the National Weather Service is beyond the capability of modern airplanes and immediate diversion must be made. It is the inexperienced or uneducated pilot who presses on "regardless", hoping that steadily worsening conditions will improve, only to find himself flying an airplane which has become so loaded with ice that he can no longer maintain altitude. At this point he has lost most, if not all, of his safety options, including perhaps a 180 degree turn to return along the course already traveled.

The responsible and well-informed pilot recognizes the limitations of weather conditions, his airplane and its systems, and reacts promptly.

### ***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 and shape, spacing between the echoes, and the capabilities of you and your airplane. Remember that weather radar detects only precipitation drops. Therefore, the radar scope provides no assurance of avoiding turbulence. The radar scope also does not provide assurance of avoiding

instrument weather from 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. The intensity of the radar echo from hail varies with the size and nature of the hailstone. A hailstone with a wet surface gives a strong radar return while a dry hailstone gives a relatively weak return. 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.

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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  $-15^{\circ}\text{C}$ .
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 en route. 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 pilot's 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 maximum operating 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.

### ***FLIGHT OF MULTI-ENGINE AIRPLANES WITH ONE ENGINE INOPERATIVE***

The major difference between flying a twin-engine and single-engine airplane is knowing how to manage the flight if one engine loses power for any reason. Safe flight with one engine inoperative requires an understanding of the basic aerodynamics involved - as well as proficiency in engine out procedures.

Loss of power from one engine affects both climb performance and controllability of twin-engine airplanes. Climb performance depends on an excess of power over that required for level flight. Loss of power from one engine obviously represents a 50% loss of horsepower but, in virtually all twin-engine airplanes, climb performance is reduced by at least 80%. A study of the charts in your Pilot's Operating



Handbook and FAA Approved Airplane Flight Manual will confirm this fact. Single-engine climb performance depends on four factors:

|                 |                                                                     |
|-----------------|---------------------------------------------------------------------|
| <b>Airspeed</b> | too little, or too much, will decrease climb performance            |
| <b>Drag</b>     | gear, flaps, cowl flaps, prop, and speed                            |
| <b>Power</b>    | amount available in excess of that needed for level flight          |
| <b>Weight</b>   | passengers, baggage, and fuel load greatly affect climb performance |

Loss of power on one engine creates yaw due to asymmetric thrust. Yaw forces must be balanced with the rudder. Loss of power on one engine also reduces airflow over the wing causing a roll toward the "dead" engine which must be balanced with the aileron. The net result of these forces cause the airplane to sideslip slightly toward the dead engine. This sideslip may be balanced by banking slightly (up to 5°) into the operating engine.

**CAUTION**

In the event of an engine failure with the main tanks less than one-quarter full, corrective action must be taken immediately to prevent large yaw angles from developing and causing stoppage of the remaining engine.

Airspeed is the key to safe single engine operations. For most twin-engine airplanes there is:

| <b>Symbol</b>          | <b>Description</b>                                                                             |
|------------------------|------------------------------------------------------------------------------------------------|
| <b>V<sub>MCA</sub></b> | Airspeed below which directional control cannot be maintained                                  |
| <b>V<sub>SSE</sub></b> | Airspeed below which an intentional engine cut should never be made                            |
| <b>V<sub>YSE</sub></b> | Airspeed that will give the best single engine rate-of-climb (or the slowest loss of altitude) |
| <b>V<sub>XSE</sub></b> | Airspeed that will give the steepest angle-of-climb with one engine out                        |

### ***AIR MINIMUM CONTROL SPEED (V<sub>MCA</sub>)***

V<sub>MCA</sub> is designated by the red radial on the airspeed indicator and indicates the minimum control speed, airborne at sea level. V<sub>MCA</sub> is determined by FAA regulations as the minimum airspeed at which it is possible to recover directional control of the airplane within 20 degrees heading change, and thereafter maintain straight flight, with not more than 5 degrees of bank if one engine fails suddenly with:

- Takeoff power on both engines
- Rearmost allowable center of gravity
- Flaps in takeoff position
- Propeller windmilling in takeoff pitch configuration

However, sudden engine failures rarely occur with all factors listed above, and therefore, the actual V<sub>MCA</sub> in any particular situation may be a little slower than the red radial on the airspeed indicator. Most airplanes with an inoperative engine will not maintain level flight at maximum power at speeds at or near V<sub>MCA</sub>. Consequently, it is not advisable to fly at speeds approaching V<sub>MCA</sub>, except in training situations or during flight tests. Adhering to the practice of never flying at or below the published V<sub>MCA</sub> speed for your airplane does not eliminate loss of directional control as a problem in the

event of an engine failure. The pilot must be prepared to use assertive control input to maintain airplane control following an engine failure.

### ***INTENTIONAL ONE-ENGINE INOPERATIVE SPEED ( $V_{SSE}$ )***

$V_{SSE}$  is specified by the airplane manufacturer and is the minimum speed at which to perform intentional engine cuts. Use of  $V_{SSE}$  is intended to reduce the accident potential from loss of control after engine cuts at or near minimum control speed.  $V_{MCA}$  demonstrations are necessary in training but should only be made at safe altitude above the terrain and with power reduction on one engine made at or above  $V_{SSE}$ .

### ***ONE-ENGINE-INOPERATIVE BEST RATE-OF-CLIMB SPEED ( $V_{YSE}$ )***

$V_{YSE}$  is designated by the blue radial on the airspeed indicator.  $V_{YSE}$  delivers the greatest gain in altitude in the shortest possible time, and is based on the following criteria:

- Critical engine inoperative, and its propeller in the minimum drag position.
- Operating engine set at not more than the maximum continuous power.
- Landing gear retracted.
- Wing flaps up.
- Cowl flaps as required for engine cooling.
- Airplanes flown at recommended bank angle (up to 5° into operating engine).

Drag caused by a windmilling propeller, extending landing gear, or flaps in the landing position, will severely degrade or destroy single engine climb performance. Since climb

performance varies widely with type of airplane, weight, temperature, altitude, and airplane configuration, the climb gradient (altitude gain or loss per mile) may be marginal - or even negative - under some conditions. Study the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for your airplane and know what performance to expect with one engine out.

***ONE-ENGINE-INOPERATIVE BEST  
ANGLE-OF-CLIMB SPEED ( $V_{XSE}$ )***

$V_{XSE}$  is used only to clear obstructions during initial climb-out as it gives the greatest altitude gain per unit of horizontal distance. It provides less engine cooling and requires more rudder control input than  $V_{YSE}$ .

***SINGLE ENGINE SERVICE CEILING***

The single engine service ceiling is the maximum altitude at which an airplane will climb at a rate of at least 50 feet per minute in smooth air, with one engine inoperative.

The single engine service ceiling chart should be used during flight planning to determine whether the airplane, as loaded, can maintain the Minimum En Route Altitude (MEA) if IFR, or terrain clearance if VFR, following an engine failure.

***BASIC SINGLE ENGINE PROCEDURES***

Know and follow, to the letter, the single-engine emergency procedures specified in your Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for your specific make and model airplane. However, the basic fundamentals of all the procedures are as follows:

1. Maintain airplane control and airspeed at all times.  
**THIS IS CARDINAL RULE NUMBER ONE.**
2. Usually, apply maximum power to the operating engine.

However, if the engine failure occurs at a speed below  $V_{MCA}$ , during cruise or in a steep turn, you may elect to use only enough power to maintain a safe speed and altitude. If the failure occurs on final approach, use power only as necessary to complete the landing.

3. Reduce drag to an absolute minimum.
4. Secure the failed engine and related sub-systems.

The first three steps should be done promptly and from memory. The check list should then be consulted to be sure that the inoperative engine is secured properly and that the appropriate switches are placed in the correct position. The airplane must be banked about  $5^\circ$  into the operating engine, with the "slip/skid" ball slightly out of center toward the operating engine, to achieve rated performance.

**Another note of caution:** Be sure to identify the dead engine, positively, before securing it. Remember: First identify the suspected engine (i.e., "Dead foot means dead engine"), second, verify with cautious throttle movement, then secure.

### ***ENGINE FAILURE ON TAKEOFF***

If an engine fails before attaining lift-off speed or below  $V_{MCA}$ , the only proper action is to discontinue the takeoff. If the engine fails after lift-off with the landing gear still down, the takeoff should still be discontinued if touchdown and roll-out on the remaining runway is still possible.

If you do find yourself in a position of not being able to climb, it is much better to reduce the power on the good engine and land straight ahead than try to force a climb and lose control.

Your Pilot's Operating Handbook and FAA Approved Airplane Flight Manual contains charts that are used in calculating the runway length required to stop if the engine fails

before reaching lift-off speed and also has charts showing the single-engine performance after lift-off.

Study your charts carefully. No airplane is capable of climbing out on one engine under all weight, pressure altitude, and temperature conditions. Know, before you take the actual runway, whether you can maintain control and climb out if you lose an engine while the gear is still down. It may be necessary to off-load some weight, or wait for more favorable temperatures.

### *WHEN TO FLY $V_X$ , $V_Y$ , $V_{XSE}$ AND $V_{YSE}$*

During normal two-engine operations, always fly  $V_Y$  ( $V_X$  if necessary for obstacle clearance) on initial climb out. Then, accelerate to your cruise climb airspeed, which may be  $V_Y$  plus 10 or 15 knots after you have obtained a safe altitude. Use of cruise climb airspeed will give you better engine cooling, increased inflight visibility and better fuel economy. However, at first indication of an engine failure during climb out, or while on approach, establish  $V_{YSE}$  or  $V_{XSE}$ , whichever is appropriate. (Consult your Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for specifics.)

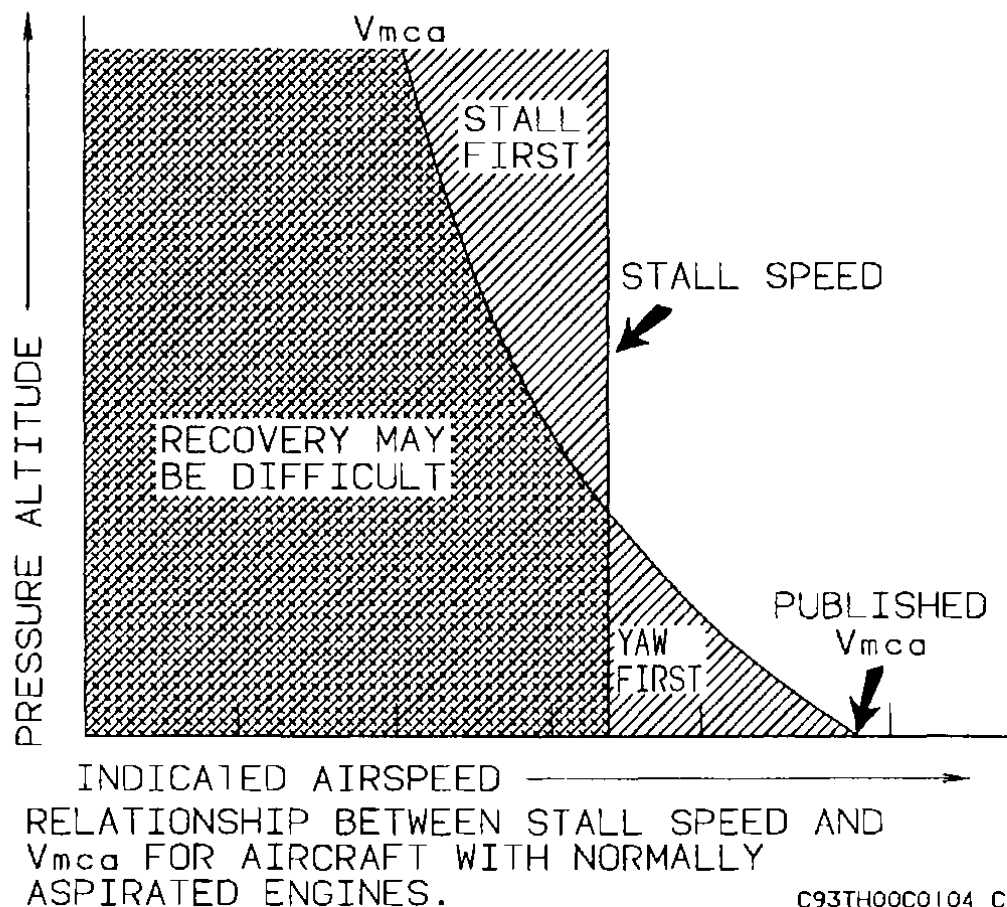
### *STALLS, SLOW FLIGHT AND TRAINING*

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 multi-engine airplanes during engine-out practice or stall demonstrations, because the stall speed is critical in all low speed operations of high-performance 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 (AC61-9B). In particular, observe carefully the warnings in the Practical Test Standards.

The single-engine stall speed of a twin-engine airplane is generally slightly below the power off (engines idle) stall speed, for a given weight condition. Single-engine stalls should not be conducted in multi-engine airplanes by other than qualified engineering test pilots.



Engine-out minimum control speed generally decreases with altitude, while the single engine stall speed remains approximately constant for normally aspirated engines. No such demonstration should be attempted when the altitude and temperature are such that the engine-out minimum control

speed is known, or discovered to be, close to the stalling speed. Loss of directional or lateral control, just as a stall occurs, is potentially hazardous.

$V_{SSE}$ , the airspeed below which an engine should not be intentionally rendered inoperative for practice purposes, was established because of the apparent practice of some pilots, instructors, and examiners, of intentionally rendering an engine inoperative at a time when the airplane is being operated at a speed close to, or below the power-idle stall speed. Unless the pilot takes immediate and proper corrective action under such circumstances, it is possible to enter an inadvertent spin.

It is recognized that flight below  $V_{SSE}$  with one engine inoperative, or simulated inoperative, may be required for conditions such as practice demonstration of  $V_{MCA}$  for multi-engine pilot certification. Refer to the procedure set forth in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for your airplane. This procedure calls for simulating one engine inoperative by reducing the power level (throttle) on one engine to idle while operating at an airspeed above  $V_{SSE}$ . Power on the other engine is set at maximum, then airspeed is reduced at approximately one knot per second until either  $V_{MCA}$  or stall warning is obtained. During this transition, rudder should be used to maintain directional control, and ailerons should be used to maintain a 5° bank toward the operative engine. At the first sign of either  $V_{MCA}$  or stall warning (which may be evidenced by inability to maintain longitudinal, lateral or directional control, aerodynamic stall buffet, or stall warning horn sound), recovery must be initiated immediately by reducing power to idle on operative engine and lowering the nose to regain  $V_{SSE}$ . Resume normal flight. This entire procedure should be used at a safe altitude of at least 5,000 feet above the ground in clear air only.

If stall warning is detected prior to the first sign of  $V_{MCA}$ , an engine-out minimum control speed demonstration cannot be



accomplished under the existing gross weight conditions and should not be attempted.

### *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.

In any twin engine airplane, fundamental aerodynamics dictate that if the airplane is allowed to become fully stalled while one engine is providing lift-producing thrust, the yawing moment which can induce a spin will be present. Consequently, it is important to immediately reduce power on the operating engine, lower the nose to reduce the angle of attack, and increase the airspeed to recover from the stall.

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## **Beechcraft**

### **Twin Engine (Piston)**

In any twin engine airplane, if application of stall recovery controls is delayed, a rapid rolling and yawing motion may develop, even against full aileron and rudder, resulting in the airplane becoming inverted during the onset of a spinning motion. Once the airplane has been permitted to progress beyond the stall and is allowed to reach the rapid rolling and yawing condition, the pilot must then immediately initiate the generally accepted spin recovery procedure for multi-engine airplanes, which is as follows:

Immediately move the control column full forward, apply full rudder opposite to the direction of the spin and reduce power on both engines to idle. These three actions should be done as near simultaneously as possible; then continue to hold this control position until rotation stops, then neutralize all controls and execute a smooth pullout. Ailerons should be neutral during recovery. **THE LONGER THE PILOT DELAYS BEFORE TAKING CORRECTIVE ACTION, THE MORE DIFFICULT RECOVERY WILL BECOME.**

Always remember that extra alertness and pilot techniques are required for slow flight maneuvers, including the practice or demonstration of stalls or  $V_{MCA}$ . 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 or single-engine maneuvers, 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. For twin engine airplanes, when descending to traffic altitude and during pattern entry and all other flight operations, maintain speed no lower than  $V_{SSE}$ . On final approach maintain at least the airspeed shown in the flight manual. Should a go-around be required, do not apply more power than necessary until the airplane has accelerated to  $V_{SSE}$ . Recognize that under some conditions of weight, density altitude, and airplane configuration, a twin engine airplane cannot climb or accelerate on a single engine. Hence a single engine go-around is impossible and the airplane is committed to a landing. Plan your approach accordingly.
- 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.**

## ***DESCENT***

In twin 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 temperatures 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 light-headed or dizzy sensation, tingling or warm sensation, sweating, reduced visual field, sleepiness, blue coloring of skin, fingernails, and lips, and behavior changes. A particularly dangerous feature of hypoxia is an increased sense of well-being, called euphoria. It obscures a person's ability and desire to be critical of himself, slows reaction time, and impairs thinking ability. Consequently, a hypoxic individual commonly believes things are getting progressively better while he nears total collapse.

The symptoms are slow but progressive, insidious in onset, and are most marked at altitudes starting above ten thousand feet. Night vision, however, can be impaired starting at an altitude of 5,000 feet. Persons who have recently overindulged in alcohol, who are moderate to heavy smokers, or

who take certain drugs, may be more susceptible to hypoxia. Susceptibility may also vary in the same individual from day to day or even morning to evening. Use oxygen on flights above 10,000 feet and at any time when symptoms appear.

Depending upon altitude, a hypoxic individual has a limited time to make decisions and perform useful acts, even though he may remain conscious for a longer period. If pressurization equipment fails at certain altitudes the pilot and passengers have only a certain amount of time to get an oxygen mask on before they exceed their time of useful consciousness. The time of useful consciousness is approximately 3-5 minutes at 25,000 feet of altitude for the average individual and diminishes markedly as altitude increases. At 30,000 feet altitude, for example, the time of useful consciousness is approximately 1-2 minutes. Therefore, in the event of depressurization, oxygen masks should be used immediately.

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 to 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.

Pilots of pressurized airplanes should receive physiological training with emphasis on hypoxia and the use of oxygen and oxygen systems. Pilots of airplanes with pressure demand oxygen systems should undergo training, experience altitude chamber decompression, and be familiar with pressure breathing before flying at high altitude. This training is available throughout the United States at nominal cost. Information regarding this training may be obtained by request from the Chief, Civil Aeromedical Institute, Attention: Aeromedical Education Branch, AAC-140, Mike Monroney Aeronautical Center, P. O. Box 25082, Oklahoma City, Oklahoma 73125

### ***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 crew-member 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, anti-histamines, 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 aviator's "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

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and numbness. Some of these symptoms are similar to hypoxia. The only known remedy for decompression sickness is recompression, which can only be accomplished in an unpressurized airplane by descending. The pilot should immediately descend if it is suspected that this condition exists, since the effects will only worsen with continued exposure to the reduced pressure environment at altitude and could result, if uncorrected, in complete incapacitation. The possibility of decompression sickness can be greatly reduced by pre-breathing oxygen prior to flight and by commencing oxygen breathing well below the altitudes where it is legally mandatory.

## **A FINAL WORD**

Airplanes are truly remarkable machines. They enable us to shrink distance and time, and to expand our business and personal horizons in ways that, not too many years ago, were virtually inconceivable. For many businesses, the general aviation airplane has become the indispensable tool of efficiency.

Advances in the mechanical reliability of the airplanes we fly have been equally impressive, as attested by the steadily declining statistics of accidents attributed to mechanical causes, at a time when the airframe, systems and power plants have grown infinitely more complex. The explosion in capability of avionics systems is even more remarkable. Radar, RNAV, LORAN, sophisticated autopilots and other devices which, just a few years ago, were too large and prohibitively expensive for general aviation size airplanes, are becoming increasingly commonplace in even the smallest airplanes.

It is thus that this Safety Information is directed to the pilot, for it is in the area of the skill and proficiency of you, the pilot, that the greatest gains in safe flying are to be made over the years to come. Intimate knowledge of your airplane, its capabilities and its limitations, and disciplined adherence to the procedures for your airplane's operation, will enable you to transform potential tragedy into an interesting hangar story when - as it inevitably will - the abnormal situation is presented.

Know your airplane's limitations, and your own. Never exceed either.

Safe flying,

**BEECH AIRCRAFT CORPORATION**

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