

Raytheon Aircraft

P/N 58-590000-59

Original Issue - August, 2002

INSTRUCTION SHEET

**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*

Instruction Sheet (Cont'd)
58-590000-59
Original Issue - August, 2002
INSTRUCTIONS

1. Turn to the SUPPLEMENTS Section of the manual.
2. More than one Log of Supplements (LoS) may be supplied with this Supplement. Select the LoS with the part number that corresponds to your basic manual. Discard the others.
3. Compare the date of the LoS in the manual with the date of the new LoS retained in Step 2. It may occur that the LoS already in the manual has a later date. Retain the LoS having the later date and discard the older LoS.
4. Place the new supplement in the position indicated on the LoS page.

After Compliance, this Instruction Sheet may be Discarded

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 58/58A

Pilot's Operating Handbook
and

FAA Approved Airplane Flight Manual

P/N 58-590000-21

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|--|------------|---------|
| 36-590002-47 | Full Flap Warning Horn System | 3 | 12/90 |
| 36-590002-49 | Landing Gear Warning Light System | | 12/90 |
| 58-590000-23 | Air Conditioning System | | 10/83 |
| 58-590000-25 | AirData AD611/D Area Navigation System | | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-33 | Flight In Icing Conditions (Furnished Only When Kit No. 58-5012 Installed) | 2 | 9/98 |
| 58-590000-37 | Dual Voltage Regulators (Kit No. 55-3024) | | 5/84 |
| 58-590000-49 | Inside Cabin Door Handle with Open/Closed Placard | | 12/90 |
| 58-590000-59 | Instrument Air Pressure System Check | 1 | 8/02 |
| 96-590010-19 | King KN-74 Area Navigation System | | 2/79 |
| 96-590010-21 | Nickel-Cadmium Battery and Charge Current Detector | | 10/76 |
| 96-590010-23 | 100-Amp. Alternator | | 10/76 |
| 96-590010-27 | Narco Avionics RNAV 161 Multi-Waypoint Area Navigation System | | 1/79 |

Log Of Supplements (Cont'd)
58-590000-21
August, 2002

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|--|------------|----------|
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | 1 | 1/80 |
| 102-590000-45 | King KNC-610 Area Navigation System | 1 | 11/78 |
| 102-590000-53 | King KNS-81 Integrated Navigation System | | 10/83 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/77 |
| SA773CE | Hartzell Propellers | 3 | 3/25/76 |

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 58/58A

**Pilot's Operating Handbook
and**

FAA Approved Airplane Flight Manual

P/N 58-590000-31B

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------------|---|--------------------|-------------|
| 130598 | Landing Gear Safety System | 3 | 1/83 |
| 131268 | Manual Cowl Flaps | | 1/82 |
| 36-590002-47 | Full Flap Warning Horn System | | 12/90 |
| 58-590000-23 | Air Conditioning System | 3 | 10/83 |
| 58-590000-33 | Flight In Icing Conditions (Furnished Only When Kit No. 58-5012 Installed) | 2 | 9/98 |
| 58-590000-37 | Dual Voltage Regulators (Kit No. 55-3024) | | 5/84 |
| 58-590000-49 | Inside Cabin Door Handle with Open/ 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 Current Detector | | 10/76 |
| 96-590010-23 | 100-Amp. Alternator | | 10/76 |
| SA773CE | Hartzell Propellers | 3 | 3/25/76 |

Log Of Supplements (Cont'd)

58-590000-31B

August, 2002

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 58/58A

Pilot's Operating Handbook
and

FAA Approved Airplane Flight Manual

P/N 58-590000-35

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|--|------------|---------|
| 36-590002-47 | Full Flap Warning Horn System | 3 | 12/90 |
| 36-590002-49 | Landing Gear Warning Light System | | 12/90 |
| 58-590000-23 | Air Conditioning System | | 10/83 |
| 58-590000-25 | AirData AD611/D Area Navigation System | | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-33 | Flight In Icing Conditions (Furnished Only When Kit No. 58-5012 Installed) | 2 | 9/98 |
| 58-590000-49 | Inside Cabin Door Handle with Open/Closed Placard | | 12/90 |
| 58-590000-53 | Low Throttle Landing Gear Retract Prevention System | | 12/90 |
| 58-590000-59 | Instrument Air Pressure System Check | 1 | 8/02 |
| 96-590010-19 | King KN-74 Area Navigation System | | 2/79 |
| 96-590010-21 | Nickel-Cadmium Battery and Charge Current Detector | | 10/76 |
| 96-590010-27 | Narco Avionics RNAV 161 TSO Multi-Waypoint Area Navigation System | | 1/79 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | 1 | 1/80 |

Log Of Supplements (Cont'd)
58-590000-35
August, 2002

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------------|--|--------------------|--------------|
| 102-590000-45 | King KNC-610 Area Navigation System | 1 | 11/78 |
| 102-590000-53 | King KNS-81 Integrated Navigation System | | 10/83 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/ 77 |

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.*

Raytheon Aircraft
LOG OF SUPPLEMENTS
Beech Baron® 58/58A
Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

P/N 58-590000-39B

September, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|---------------|--|---------|---------|
| 36-590002-47 | Full Flap Warning Horn System | 3 | 12/90 |
| 36-590002-49 | Landing Gear Warning Light System | | 12/90 |
| 58-590000-23 | Air Conditioning System | | 10/83 |
| *58-590000-25 | AirData AD611/D Area Navigation System | | 6/21/77 |
| *58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| *58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| *58-590000-47 | Teledyne Continental 50-Amp Alternator System | | 5/89 |
| 58-590000-49 | Inside Cabin Door Handle with Open/Closed Placard | | 12/90 |
| *58-590000-51 | Bendix/King KLN-88 Multi-Chain Loran Navigation System | | 3/90 |
| 58-590000-53 | Low Throttle Landing Gear Retract Prevention System | | 12/90 |
| 58-590000-55 | ARTEX ELT 110-4-002 with Remote Cockpit Switch | 1 | 12/99 |

Log Of Supplements (Cont'd)
58-590000-39B
September, 2002

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------|---|------------|--------------------------|
| 58-590000-57 | Dual Garmin GNS 430 or Garmin GNS 530 & Garmin GNS 430 VHF Communications Transceivers/VOR/ILS Receivers/GPS Receivers with Garmin Course Deviation Indicator with Mid-Continent Instruments GPS Annunciator Control Unit with PS Engineering PMA7000M-S Audio Panel with BF Goodrich WX-500 Weather Mapping Sensor with Shadin F/ADC 200 or 200+ Fuel/Air Data Computer when used with Allied Signal KFC 225 Automatic Flight Control System | 1 | 08/00 |
| 58-590000-59 | Instrument Air Pressure System Check | | 8/02 |
| 58-590000-0061 | Honeywell KMH880 Multi-Hazard Awareness System | | 8/02 |
| *96-590010-19 | King KN-74 Area Navigation System | 1 | 2/79 |
| *96-590010-27 | Narco Avionics RNAV 161 TSO Multi-Waypoint Area Navigation System | | 1/79 |
| *96-590011-21 | Bendix NP-2041A NAV Computer Programmer | 1 | 1/80 |
| *102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| *102-590000-53 | King KNS-81 Integrated Navigation System | 1 | 10/83 |
| *106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/ 77 |
| HPBE58-2 | Hartzell 3-Bladed Propellers per STC SA5533NM | | 11/24/ 98 or later |
| **006-0084-0000 | Bendix/King KLN 90B GPS Navigation System per STC SA00248WI-D | A | 8/21/98 or later |
| **006-00855-0000 | Bendix/King KFC 225 Automatic Flight Control System per STC SA00691WI-D | A | 1/20/99 or later |

Log Of Supplements (Cont'd)

58-590000-39B

September, 2002

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 58P/58PA

FAA Approved Airplane Flight Manual

P/N 102-590000-13B

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------------|--------------------------------------|--------------------|-------------|
| 58-590000-59 | Instrument Air Pressure System Check | | 8/02 |
| 102-590000-17 | KN-74 Area Navigation System | | 8/22/75 |
| 102-590000-29 | Flight In Icing Conditions | | 5/28/76 |
| 102-590000-65 | Flight In Icing Conditions | | 10/95 |

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.*

Raytheon Aircraft
LOG OF SUPPLEMENTS
Beech Baron® 58P/58PA
Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

P/N 102-590000-31

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------------|---|--------------------|-------------|
| 58-590000-25 | AirData AD611/D Area Navigation System | 1 | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-59 | Instrument Air Pressure System Check | 1 | 8/02 |
| 96-590010-27 | Narco Avionics RNAV 161 Multi-Waypoint Area Navigation System | | 1/79 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | | 1/80 |
| 102-590000-35 | Propeller Reset Governors | 2 | 8/81 |
| 102-590000-39 | KN-74 Area Navigation System | | 10/76 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| 102-590000-47 | Item Deleted | | |
| 102-590000-65 | Flight In Icing Conditions | | 10/95 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/77 |

Log Of Supplements (Cont'd)

102-590000-31

August, 2002

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 58P/58PA

Pilot's Operating Handbook
and

FAA Approved Airplane Flight Manual

P/N 102-590000-41

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|--|------------|----------|
| 58-590000-25 | AirData AD611/D Area Navigation System | | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-59 | Instrument Air Pressure System Check | | 8/02 |
| 96-590010-27 | Narco Avionics RNAV 161 Multi-Waypoint Area Navigation System | | 1/79 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | 1 | 1/80 |
| 102-590000-39 | KN-74 Area Navigation System | | 10/76 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| 102-590000-49 | Operation of United Kingdom Registered Aircraft (TJ-188 and after) | | 1/79 |
| 102-590000-53 | King KNS-81 Integrated Navigation System | 1 | 10/83 |
| 102-590000-65 | Flight In Icing Conditions | | 10/95 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/77 |

Log Of Supplements (Cont'd)

102-590000-41

August, 2002

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 58P/58PA

Pilot's Operating Handbook
and

FAA Approved Airplane Flight Manual

P/N 102-590000-57

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|---|------------|----------|
| 58-590000-25 | AirData AD611/D Area Navigation System | 1 | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-59 | Instrument Air Pressure System Check | 1 | 8/02 |
| 96-590010-27 | Narco Avionics RNAV 161 Multi-Waypoint Area Navigation System | | 1/79 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | | 1/80 |
| 102-590000-39 | KN-74 Area Navigation System | 1 | 10/76 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| 102-590000-53 | King KNS-81 Integrated Navigation System | | 10/83 |
| 102-590000-65 | Flight In Icing Conditions | | 10/95 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/77 |

Log Of Supplements (Cont'd)

102-590000-57

August, 2002

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 58TC/58TCA

Pilot's Operating Handbook
and

FAA Approved Airplane Flight Manual

P/N 106-590000-5

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|---------------|---|---------|----------|
| 58-590000-25 | AirData AD611/D Area Navigation System | | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-49 | Inside Cabin Door Handle with Open/Closed Placard | | 12/90 |
| 58-590000-59 | Instrument Air Pressure System Check | | 8/02 |
| 96-590010-27 | Narco Avionics RNAV 161 TSO Multi-Waypoint Area Navigation System | | 1/79 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | 1 | 1/80 |
| 102-590000-35 | Propeller Reset Governor | 2 | 8/81 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| 102-590000-65 | Flight In Icing Conditions | | 10/95 |
| 106-590000-7 | KN-74 Area Navigation System | | 1/76 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/77 |

Log Of Supplements (Cont'd)

106-590000-5

August, 2002

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 58TC/58TCA

Pilot's Operating Handbook
and

FAA Approved Airplane Flight Manual

P/N 106-590000-19

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|---|------------|----------|
| 58-590000-25 | AirData AD611/D Area Navigation System | 1 | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-49 | Inside Cabin Door Handle with Open/Closed Placard | | 12/90 |
| 58-590000-59 | Instrument Air Pressure System Check | 1 | 8/02 |
| 96-590010-27 | Narco Avionics RNAV 161 Multi-Waypoint Area Navigation System | | 1/79 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | | 1/80 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| 102-590000-53 | King KNS-81 Integrated Navigation System | 1 | 10/83 |
| 102-590000-65 | Flight In Icing Conditions | | 10/95 |
| 106-590000-7 | KN-74 Area Navigation System | | 1/76 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/77 |

Log Of Supplements (Cont'd)

106-590000-19

August, 2002

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.*

Raytheon Aircraft
LOG OF SUPPLEMENTS
Beech Baron® 58TC/58TCA
Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

P/N 106-590000-21

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------------|---|--------------------|--------------|
| 58-590000-25 | AirData AD611/D Area Navigation System | | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-49 | Inside Cabin Door Handle with Open/ Closed Placard | | 12/90 |
| 58-590000-59 | Instrument Air Pressure System Check | | 8/02 |
| 96-590010-27 | Narco Avionics RNAV 161 TSO Multi- Waypoint Area Navigation System | | 1/79 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | 1 | 1/80 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| 102-590000-53 | King KNS-81 Integrated Navigation System | 1 | 10/83 |
| 106-590000-7 | KN-74 Area Navigation System | | 1/76 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/ 77 |

Log Of Supplements (Cont'd)

106-590000-21

August, 2002

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.*

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 NUMBER | SUBJECT | REV 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- tem | | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Naviga- tion System | 1 | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation Sys- tem | | 1/79 |
| 58-590000-49 | Inside Cabin Door Handle with Open/ 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 Current Detector | | 10/76 |
| 96-590010-27 | Narco Avionics RNAV 161 Multi-Way- point Area Navigation System | | 1/79 |
| 96-590011-19 | Operation of United Kingdom Registered Aircraft | 1 | 10/78 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Pro- grammer | 1 | 1/80 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| 102-590000-53 | King KNS-81 Integrated Navigation Sys- tem | 1 | 10/83 |

Log Of Supplements (Cont'd)

96-590011-17

August, 2002

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|---|------------|----------|
| 106-590000-15 | Collins ANS-351 Area Navigation Sys- 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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® E55 & E55A

Pilot's Operating Handbook
and

FAA Approved Airplane Flight Manual

P/N 96-590010-17

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|--------------|--|---------|---------|
| 36-590002-47 | Full Flap Warning Horn System | 3 | 12/90 |
| 36-590002-49 | Landing Gear Warning Light System | | 12/90 |
| 58-590000-23 | Air Conditioning System | | 10/83 |
| 58-590000-25 | AirData AD611/D Area Navigation System | | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-49 | Inside Cabin Door Handle with Open/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 Current Detector | | 10/76 |
| 96-590010-23 | 100-Amp. Alternator | | 10/76 |
| 96-590010-25 | Aeroplanes Registered In The United Kingdom | 1 | 10/78 |
| 96-590010-27 | Narco Avionics RNAV 161 Multi-Way-point Area Navigation System | | 1/79 |
| 96-590010-33 | Flight In Icing Conditions | 2 | 9/98 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | 1 | 1/80 |

Log Of Supplements (Cont'd)**96-590010-17****August, 2002**

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------------|--|--------------------|-------------|
| 102-590000-45 | King KNC-610 Area Navigation System | 1 | 11/78 |
| 102-590000-53 | King KNS-81 Integrated Navigation System | | 10/83 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/77 |
| SA773CE | Hartzell Propellers | 3 | 3/25/76 |

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® 95-C55/95-C55A, D55/D55A,
E55/E55A

Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

P/N 96-590010-29B

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|---|------------|---------|
| 130478 | Goodrich Electrothermal Prop Deice System | | 7/79 |
| 130598 | Landing Gear Safety System | 3 | 1/83 |
| 130739 | Beech H-14 Autopilot | | 7/79 |
| 131268 | Manual Cowl Flaps | | 1/82 |
| 36-590002-47 | Full Flap Warning Horn System | | 12/90 |
| 55-590000-51 | Goodyear Electrothermal Prop Deice System | | 10/78 |
| 55-590000-63 | Beech H-14 Autopilot | | 7/79 |
| 58-590000-37 | Dual Voltage Regulators (Kit 55-3024) | | 5/84 |
| 58-590000-49 | Inside Cabin Door Handle with Open/ Closed Placard | | 12/90 |
| 58-590000-59 | Instrument Air Pressure System Check | | 8/02 |
| 95-590014-67 | Tactair T-3AL and T-3ALL Autopilot | | 7/79 |
| 96-590000-1 | Auxiliary Fuel Annunciator Light (Kit 96- 9001-1) | | 11/93 |
| 96-590010-19 | King KN-74 Area Navigation System | 1 | 2/79 |
| 96-590010-21 | Nickel-Cadmium Battery and Charge Current Detector | | 10/76 |
| 96-590010-23 | 100-Amp. Alternator | | 10/76 |
| SA773CE | Hartzell Propellers | 3 | 3/25/76 |

Log Of Supplements (Cont'd)

96-590010-29B

August, 2002

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® E55

Pilot's Operating Handbook and FAA Approved Airplane Flight Manual

P/N 96-590010-31

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------------|---|--------------------|-------------|
| 131289 | United Kingdom | | 7/74 |
| 36-590002-47 | Full Flap Warning Horn System | | 12/90 |
| 58-590000-37 | Dual Voltage Regulators (Kit 55-3024) | | 5/84 |
| 58-590000-49 | Inside Cabin Door Handle with Open/ 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 Current Detector | | 10/76 |
| 96-590010-23 | 100-Amp. Alternator | | 10/76 |
| SA773CE | Hartzell Propellers | 3 | 3/25/76 |

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Baron® E55 & E55A

Pilot's Operating Handbook
and

FAA Approved Airplane Flight Manual

P/N 96-590010-37

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|----------------|--|------------|---------|
| 58-590000-23 | Air Conditioning System | 3 | 10/83 |
| 58-590000-25 | AirData AD611/D Area Navigation System | | 6/21/77 |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |
| 58-590000-49 | Inside Cabin Door Handle with Open/ 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 Current Detector | | 10/76 |
| 96-590010-23 | 100-Amp. Alternator | | 10/76 |
| 96-590010-25 | Aeroplanes Registered In The United Kingdom | 1 | 10/78 |
| 96-590010-27 | Narco Avionics RNAV 161 Multi-Way- point Area Navigation System | | 1/79 |
| 96-590010-33 | Flight In Icing Conditions | 2 | 9/98 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Pro- grammer | 1 | 1/80 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |

Log Of Supplements (Cont'd)**96-590010-37****August, 2002**

| PART NUMBER | SUBJECT | REV NO. | DATE |
|------------------------|---|--------------------|-------------|
| 102-590000-53 | King KNS-81 Integrated Navigation Sys- tem | 1 | 10/83 |
| 106-590000-15 | Collins ANS-351 Area Navigation Sys- tem | | 11/16/77 |
| SA773CE | Hartzell Propellers | 3 | 3/25/76 |

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.*

Raytheon Aircraft

LOG OF SUPPLEMENTS

Beech Duchess 76®

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

P/N 105-590000-5

August, 2002

FAA Supplement must be in the airplane for all flight operations when subject equipment is installed.

| PART NUMBER | SUBJECT | REV NO. | DATE |
|-------------------------------|--|--------------------|---------------|
| 58-590000-59 105-590000-25 | Instrument Air Pressure System Check King KNS-80 Integrated Navigation System | | 8/02 01/80 |

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.*

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

Copyright © Raytheon Aircraft Company 2002

**Issued: August, 2002
P/N 58-590000-59**

1 of 10

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 | <i>Thorne</i> |

CONTENTS

| | |
|--|--------|
| SECTION I - GENERAL | Page 3 |
| SECTION II - LIMITATIONS | Page 3 |
| SECTION III - EMERGENCY PROCEDURES | Page 3 |
| SECTION IV - NORMAL PROCEDURES | Page 4 |
| SECTION V - PERFORMANCE | Page 5 |
| SECTION VI - WT & BAL/EQUIPMENT LIST | Page 5 |
| SECTION VII - SYSTEMS DESCRIPTION | Page 6 |
| SECTION VIII - HANDLING, SERVICING & MAINT . . . | Page 9 |

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.

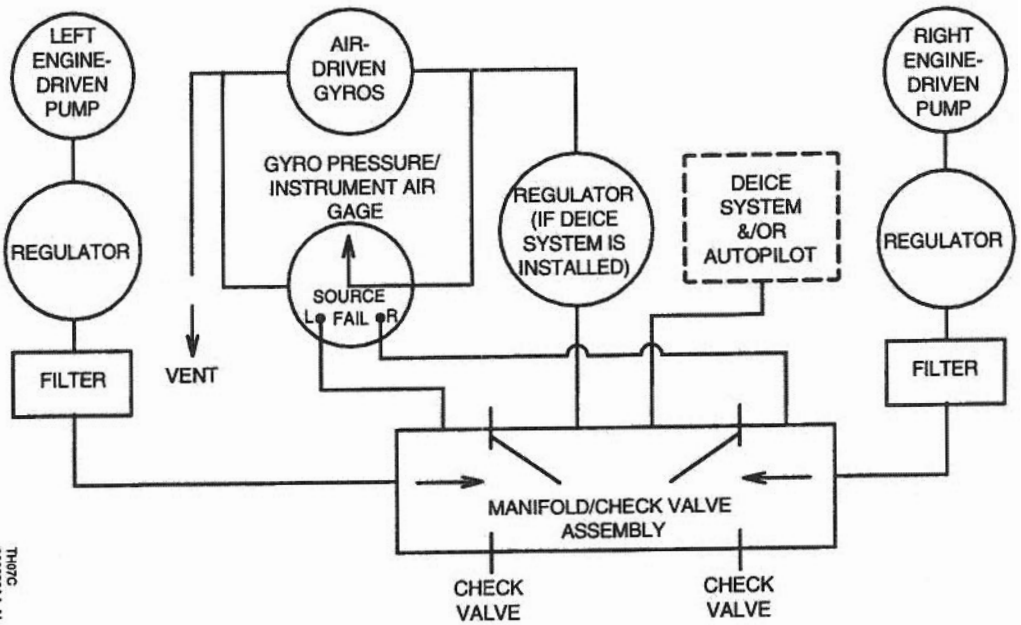
SHUTDOWN INSTRUMENT AIR PRESSURE SYSTEM CHECK

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
022838AAJ1

INSTRUMENT AIR PRESSURE SYSTEM SCHEMATIC

SECTION VIII - HANDLING, SERV & MAINT

No Change

**THIS PAGE INTENTIONALLY LEFT
BLANK**

Orange
Raytheon Aircraft

Beech® Baron 58P

PRESSURIZED

(Serials TJ-46, TJ-55,
TJ-83, TJ-85 thru TJ-168)

and

**58PA
Special Reduced
Gross Weight
Configuration**

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

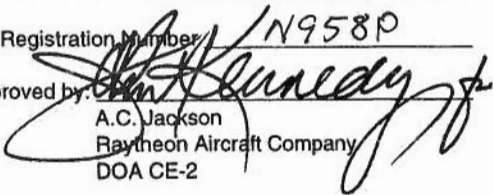
FAA Approved in the Normal Category based on FAR 23. This document must be carried in the airplane at all times and be kept within reach of the pilot during all flight operations.

This handbook includes the material required to be furnished to the pilot by FAR 23.

Airplane Serial Number: TJ-139

Airplane Registration Number: N958P

FAA Approved by:


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

Copyright © Raytheon Aircraft Company 1998

P/N 102-590000-31
Issued: October, 1976

P/N 102-590000-31A10
Revised: September, 1998

Published By
RAYTHEON AIRCRAFT COMPANY

P.O. Box 85
Wichita, Kansas 67201
U.S.A.

NOTE

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

Raytheon Aircraft

Beech
Hawker



Member of GAMA

General Aviation
Manufacturers Association

Raytheon Aircraft

Baron 58P and 58PA

Log of Temporary Changes

to the

Pilot's Operating Handbook

and

FAA Approved Airplane Flight Manual

P/N 102-590000-31

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

| Part Number | Subject | Date |
|-------------------|--|----------|
| 102-590000-31 TC1 | Fuel Selector Placard Installation (affects Limitations section) | 10/21/97 |

Note: This page shall be filed in the front of the *Pilot's Operating Handbook* and *FAA Approved Airplane Flight Manual* immediately in front of the latest *Log of Revisions* page(s). This page replaces any *Log of Temporary Changes* page dated prior to the date in the lower left corner of this page.

Raytheon Aircraft

Beech® Baron 58P/58PA
(TJ-46, TJ-55, TJ-83, TJ-85 thru TJ-168)

Pilot's Operating Handbook and FAA Approved Airplane Flight Manual

P/N 102-590000-31

LOG OF REVISIONS

"A10" Revision September, 1998

| | |
|--------------|--|
| Title Page | Updated |
| Page A (A10) | New |
| 2-1, 2-2 | Revised Table of Contents |
| 2-22A, 2-22B | Added "Limitations When Encountering Severe Icing Conditions" |
| 3-1, 3-2 | Revised Table of Contents |
| 3-18, 3-19 | Deleted Data, Added "Severe Icing Conditions (Alternate Method Of Compliance With FAA AD 98-04-24)" and Shifted Data |
| 4-22A | Revised "Icing Flight" |
| A10 | |

Raytheon Aircraft

Beech Baron[®] 58P/58PA

(TJ-46, TJ-55, TJ-83, TJ-85 thru TJ-168)

Pilot's Operating Handbook and FAA Approved Airplane Flight Manual

P/N 102-590000-31

LOG OF REVISIONS

"A9" RevisionNovember, 1997

| Page | Description |
|-------------|---|
| Title Page | Updated |
| Page A (A9) | New |
| 3-1, 3-2 | Revised Table of Contents |
| 3-19 | Shifted Data |
| 3-20, 3-21 | Added "Turbocharger System Failures", Shifted Data |
| 3-22 | Shifted Data |

A9

**BARON 58P/58PA
(TJ-46, TJ-55, TJ-83, TJ-85 THRU TJ-168)
PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL
P/N 102-590000-31**

"A8" Revision December, 1995

LOG OF REVISIONS

| Page | Description |
|-------------|--|
| Title Page | Updated |
| Page A (A8) | New |
| 2-1 | Revised Table of Contents |
| 2-22 | Revised Heading, Data (ICING LIMITATIONS) |
| 3-2 | Revised Table of Contents |
| 3-16 | Shifted Data |
| 3-17 | Revised Data (ALTERNATE INSTRUMENT AIR SOURCE) |
| 3-18 | Added Procedure (OPERATIONS OUTSIDE THE FAR 25, APPENDIX C, ICING ENVELOPE) |
| 3-19, 3-20 | Shifted Data |
| 4-2 | Revised Table of Contents |
| 4-22, 4-22A | Revised Heading, Data (ICING FLIGHT) |
| 4-22B, 4-23 | Shifted Data |
| A8 | |

FAA APPROVED AIRPLANE FLIGHT MANUAL

LOG OF REVISIONS

| Page | Description |
|--------------------|--|
| Title Page | Updated |
| Page A (A7) | New |
| 10-1 thru 10-64 | Revised Section X, Safety Information (May, 1994) |

A7

**BARON 58/58PA
(TJ-46, TJ-55, TJ-83, TJ-85 THRU TJ-168)
PILOT'S OPERATING HANDBOOK
AND**

FAA APPROVED AIRPLANE FLIGHT MANUAL

A6 Revision October, 1990

LOG OF REVISIONS

| Page | Description |
|-------------|---|
| Title Page | Updated |
| Page A (A6) | |
| 1 of 2 | New |
| 2 of 2 | New |
| 2-1 | Updated |
| 2-7 | Revised PNEUMATIC PRESSURE to read DEICE PRESSURE GAGE Added NOTE |
| 2-8 | Deleted INFLIGHT PRACTICE OF VMCA |
| 2-22 | Added PNEUMATIC SURFACE DEICE BOOTS |
| 3-2 | Updated |
| 3-10 | Revised ELECTRICAL SMOKE OR FIRE |
| 3-11 | Revised ILLUMINATION OF ALTERNATOR-OUT LIGHT procedure to ALTERNATOR-OUT PROCEDURE |
| 3-12 | Revised ALTERNATE BATTERY BUS |
| 3-15 | Added NOTE |
| 3-16 | Revised SURFACE DEICE SYSTEM |

A6

LOG OF REVISIONS (CONTINUED)

| Page | Description |
|--------------------|--|
| 3-17 and 3-18 | Shifted Material |
| 3-19 | Moved PRACTICE DEMONSTRATION OF V_{MCA} to NORMAL PROCEDURES |
| 3-20 | Shifted Material |
| 4-2 | Updated |
| 4-7 | Revised BEFORE STARTING Deleted CAUTION |
| 4-21 | Revised EXTERNAL POWER |
| 4-22 | Revised EXTERNAL POWER Revised CAUTION to WARNING |
| 4-23 | Revised CAUTION to WARNING Revised SURFACE DEICE SYSTEM |
| 4-24 | Revised SURFACE DEICE SYSTEM |
| 4-25 thru 4-28 | Shifted Material |
| 4-29 | Added PRACTICE DEMONSTRATION OF V_{MCA} |
| 7-47 | Revised ICE PROTECTION SYSTEMS |
| 7-48 | Revised ICE PROTECTION SYSTEMS |
| 10-1 thru 10-68 | New SAFETY INFORMATION Section dated October, 1990 |

A6

Baron 58P/58PA Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

A5.....August, 1981

LOG OF REVISIONS

| Page | Description |
|-------------|-------------------|
| Title | Update |
| Logo Page | Added |
| A Page (A5) | Update |
| 1-9 | Revised "Engines" |
| 2-4 | Revised "Engines" |
| 7-19 | Revised "Engines" |

98-38307

A5

Baron 58P/58PA Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual

A4 June, 1979

LOG OF REVISIONS

| Page | Description |
|--|--------------------------------------|
| Title | Update |
| A Page | Update |
| 2-29, thru 2-31 | Revised Placards |
| 3-12 | Revised "Alternate Battery Bus" |
| 3-18 | Revised - "Emergency Exit" |
| 4-10 | Revised "Before Take-Off" |
| 7-16A | Revised "Forward Cabin Door Seal" |
| 10-1 thru 10-37 | Revised Safety Section |
| <div style="border: 2px solid black; padding: 10px; margin: 10px auto; width: 80%;"> <p>10-1 Thru 10-67 Revised Safety Section Dated March 1981.</p> </div> | |
| <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <p>A4</p> </div> | |

98-38307

Baron 58P/58PA Pilot's Operating Handbook and FAA Approved Airplane Flight Manual

A3..... September, 1977

LOG OF REVISIONS

| Pages | Description |
|---------------|--------------------|
| Title Page | Update |
| A Page | Update |
| 3-19 and 3-20 | Rearrange Material |

A3

**Baron 58P/58PA Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual**

A2-Revision

August, 1977

LOG OF REVISIONS

| Pages | Description |
|---|---|
| <p>Title Page Page A 1-5 1-6 2-31 3-13 and 3-14 3-15 and 3-16 3-18 7-16 7-16A and 7-16B 7-17 7-42 8-42 8-46</p> | <p>Update Update Revise "Revising The Handbook" Add note to Supplements Information Add "Placard" Rearrange Material Revise "Loss of Pressurization" Revise "Emergency Exit" Rearrange Material Revise "Forward Cabin Door" Revise "Forward Cabin Door" Revise "Cooling" Revise "Consumable Materials" Revise "Lamp Bulb Replacement Guide"</p> |

A2

**Baron 58P/58PA Pilot's Operating Handbook
and
FAA Approved Airplane Flight MANUAL**

A1 Revision December, 1976

LOG OF REVISIONS

| Pages | Description |
|---|---|
| <p>Title Page Page A 2-9 and 2-10 2-16 2-25 4-2 4-22 4-26 thru 4-28 5-3 5-6 5-9 thru 5-12 5-35 thru 5-46 5-49 thru 5-52 7-47 7-50</p> | <p>Update Update Revise Icing Information Revise Icing Information Revise Icing Information Revise Table of Contents Revise Icing Information Revise Icing Information Revise Performance Introduction Revise Performance Introduction Revise Performance Introduction Revise Graphs & Charts Revise Graphs Revise Icing Information Revise Icing Information</p> |

A1

**Baron 58P/58PA Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual**

A-Original..... October, 1976

LOG OF REVISIONS

| Pages | Description |
|-----------------|------------------------|
| Title Page | Original |
| Page A | Original |
| a and b | Original |
| 1-1 thru 1-20 | Original |
| 2-1 thru 2-31 | Original |
| 3-1 thru 3-20 | Original |
| 4-1 thru 4-28 | Original |
| 5-1 thru 5-52 | Original |
| 6-1 thru 6-17 | Original |
| 7-1 thru 7-52 | Original |
| 8-1 thru 8-52 | Original |
| Section 9 | See Log of Supplements |
| 10-1 thru 10-34 | Original |

A

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.

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

For example, attention is called to Section X (SAFETY INFORMATION). While little of the information is new — and every pilot has been exposed to the fundamentals — BEECHCRAFT feels that it is highly important to have Safety Information in a condensed form in the hands of the pilots. The Safety Information should be read and studied. Periodic review will serve as a reminder of good piloting techniques.

**Baron 58P Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual**

TABLE OF CONTENTS

| | |
|------------------|-------------------------------------|
| SECTION 1 | General |
| SECTION 2 | Limitations |
| SECTION 3 | Emergency Procedures |
| SECTION 4 | Normal Procedures |
| SECTION 5 | Performance |
| SECTION 6 | Weight and Balance/Equipment List |
| SECTION 7 | Systems Description |
| SECTION 8 | Handling, Servicing and Maintenance |
| SECTION 9 | Supplements |
| SECTION 10 | Safety Information |

SECTION I

GENERAL

TABLE OF CONTENTS

| <i>SUBJECT</i> | <i>PAGE</i> |
|------------------------------------|-------------|
| Important Notice | 1-3 |
| Use of the Handbook | 1-4 |
| Revising the Handbook | 1-5 |
| Airplane Flight Manual Supplements | |
| Revision Record | 1-6 |
| Airplane Three View | 1-7 |
| Ground Turning Clearance | 1-8 |
| DESCRIPTIVE DATA | 1-9 |
| Engines | 1-9 |
| Propellers | 1-9 |
| Fuel | 1-9 |
| Oil | 1-10 |
| Weights | 1-10 |
| Cabin Dimensions | 1-10 |
| Baggage | 1-10 |

TABLE OF CONTENTS (continued)

| SUBJECT | PAGE |
|---|------|
| Specific Loadings..... | 1-11 |
| SYMBOLS, ABBREVIATIONS AND TERMINOLOGY | 1-11 |
| Airspeed Terminology | 1-11 |
| Meteorological Terminology | 1-14 |
| Power Terminology | 1-15 |
| Engine Controls and Instruments Terminology | 1-15 |
| Airplane Performance and Flight | |
| Planning Terminology..... | 1-16 |
| Weight and Balance Terminology | 1-17 |

THANK YOU . . .

for displaying confidence in us by selecting a BEECHCRAFT airplane. Our design engineers, assemblers, and inspectors have utilized their skills and years of experience to ensure that the new BEECHCRAFT Baron 58P meets the high standards of quality and performance for which BEECHCRAFT airplanes have become famous throughout the world.

IMPORTANT NOTICE

This handbook should be read carefully by the owner and the operator in order to become familiar with the operation of the Baron 58P. Suggestions and recommendations have been made within it to aid in obtaining maximum performance without sacrificing economy. Be familiar with, and operate the airplane in accordance with, the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, and/or placards which are located in the airplane.

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

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

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

Authorized BEECHCRAFT Parts and Service Outlets will have 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 58P. The handbook has been prepared in loose leaf form for ease in maintenance and in a convenient size for storage. The handbook has been arranged with quick reference tabs imprinted with the title of each section and contains ten basic divisions:

| | |
|------------|--------------------------------------|
| Section 1 | General |
| Section 2 | Limitations |
| Section 3 | Emergency Procedures |
| Section 4 | Normal Procedures |
| Section 5 | Performance |
| Section 6 | Weight and Balance/Equipment List |
| Section 7 | Systems Description |
| Section 8 | Handling, Servicing, and Maintenance |
| Section 9 | Supplements |
| Section 10 | Safety Information |

NOTES

Due to the large variety of airplane configurations available through optional equipment, it should be noted that where information pertaining to optional equipment appears in the handbook, the optional equipment will not normally be designated as such. Due to custom design variations, the illustrations in this handbook will not be typical of every airplane.

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 BEECHCRAFT Parts and Service Outlet or refer to BEECHCRAFT Service Instructions No. 0250-010 Revision III or subsequent revisions.

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.

**AIRPLANE FLIGHT MANUAL SUPPLEMENTS
REVISION RECORD**

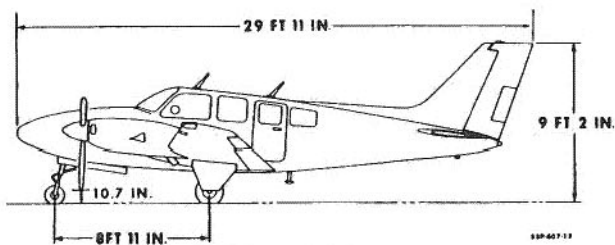
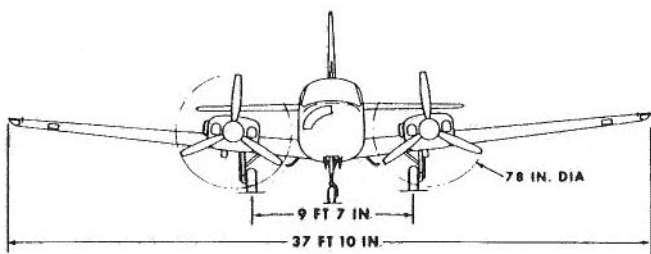
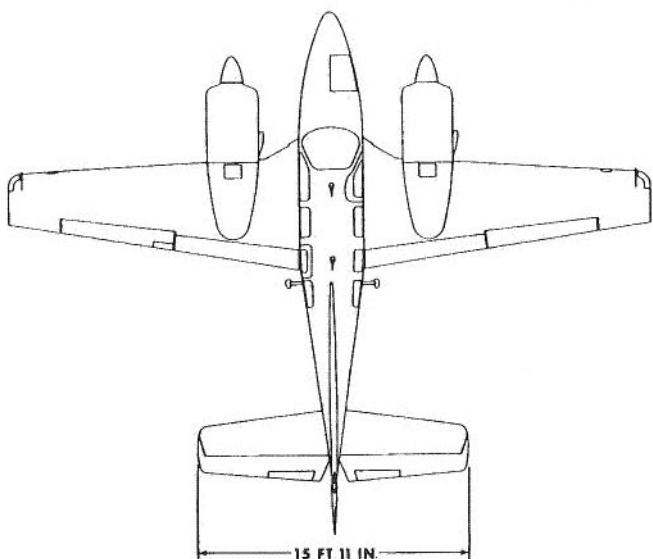
Section IX contains the FAA Approved Airplane Flight Manual Supplements headed by a Log of Supplements page. On the "Log" page is a listing of the FAA Approved Supplemental Equipment available for installation on the BEECHCRAFT Baron 58P. When new supplements are received or existing supplements are 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.

BEECHCRAFT
Baron 58P

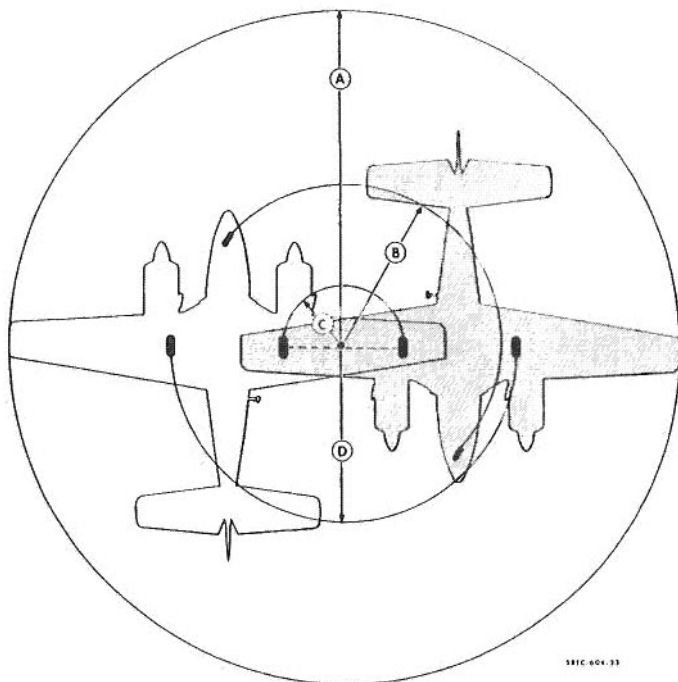
Section I
General



58P-607-11

THREE-VIEW

GROUND TURNING CLEARANCE



- | | | | |
|-----------------------------|-------|----------|----------|
| (A) Radius for Wing Tip | . . . | .30 feet | 0 inches |
| (B) Radius for Nose Wheel | . . . | .14 feet | 6 inches |
| (C) Radius for Inside Gear | . . . | .6 feet | 6 inches |
| (D) Radius for Outside Gear | . . . | .16 feet | 0 inches |

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

DESCRIPTIVE DATA

ENGINES

Two Continental TSIO-520-L or TSIO-520-LB six-cylinder, horizontally opposed, turbocharged, fuel-injected engines, each rated at 310 horsepower at 2700 rpm and 38.0 in Hg.

Take-off and Maximum

| | |
|----------------------------|-------------------------|
| Continuous Power | 38.0 in. Hg at 2700 rpm |
| Cruise Climb Power..... | 34.0 in. Hg at 2400 rpm |
| Maximum Cruise Power | 33.0 in. Hg at 2400 rpm |

PROPELLERS

Two Hartzell constant speed, full feathering, three-bladed propellers using PHC-J3YF-2F or PHC-J3YF-2UF hubs with FC7663DR or FC7663DRB blades and C3567-1P spinner assemblies; Pitch setting at 30-inch station: Low, 15.3°; Feathered, 84°; Diameter 78 inches, cut-off permitted to 77.5 inches.

FUEL

Aviation Gasoline 100 LL (blue) or 100/130 (green) minimum grade; 115/145 (purple) Aviation Gasoline alternate grade.

STANDARD SYSTEM:

| | |
|----------------------|-------------|
| Total Capacity | 172 Gallons |
| Total Usable | 166 Gallons |

OPTIONAL SYSTEM:

| | |
|----------------------|-------------|
| Total Capacity | 196 Gallons |
| Total Usable | 190 Gallons |

OIL

Ashless Dispersant oils must meet Continental Motors Corporation Specification MHS-24A. Refer to Approved Engine Oils, Section VIII, SERVICING.

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

Oil Capacity12 quarts each engine

WEIGHTS

| | 58P | 58PA |
|-------------------------|----------|----------|
| Maximum Take-off | 6100 lbs | 5995 lbs |
| Maximum Landing | 6100 lbs | 5995 lbs |
| Maximum Ramp | 6140 lbs | 6035 lbs |
| Maximum Zero Fuel | 5700 lbs | 5700 lbs |

CABIN DIMENSIONS

| | |
|-----------------------------------|---------------------------|
| Interior cabin length | 12 ft 7 in. |
| Interior cabin width (max) | 3 ft 6 in. |
| Interior cabin height (max) | 4 ft 2 in. |
| Fwd cabin door | 37 in. wide × 36 in. high |
| Aft cabin door | 23 in. wide × 35 in. high |

BAGGAGE

| | |
|---------------------------------|----------|
| Aft cabin compartment | 37 cu ft |
| Extended rear compartment | 10 cu ft |
| Nose compartment | 18 cu ft |

SPECIFIC LOADINGS

| | |
|---------------------|----------------|
| Wing Loading | 32.4 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.

AIRSPPEED TERMINOLOGY

| | |
|-----|---|
| IAS | Indicated Airspeed is the speed of an airplane as shown on its airspeed indicator. As used within this handbook IAS assumes no instrument error. |
| CAS | Calibrated Airspeed is the indicated airspeed of an airplane, corrected for position and instrument error. Calibrated airspeed is equal to true airspeed in standard atmosphere at sea level. |
| TAS | True Airspeed is the airspeed of an airplane relative to undisturbed air which is the CAS corrected for altitude, temperature, and compressibility. |
| GS | Ground Speed is the speed of an airplane relative to the ground. |

| | |
|-------------|---|
| M | Mach Number is the ratio of true airspeed to the speed of sound. |
| VMCA | Air minimum control speed is the minimum flight speed at which the airplane is directionally controllable as determined in accordance with Federal Aviation Regulations. Airplane certification conditions include one engine becoming inoperative and windmilling; a 5° bank towards the operative engine; take-off power on operative engine; landing gear up; flaps up; and most rearward C.G. |
| VSSE | The recommended safe one engine inoperative speed was selected to provide a margin above VMCA to insure the availability of control and to allow for some variation in techniques which can occur if an unexpected engine malfunction is experienced. |
| VA | Maneuvering Speed — The maximum speed at which application of full available aerodynamic control will not overstress the airplane. |
| VF | Design flap speed is the highest speed permissible at which wing flaps may be actuated. |
| VFE | Maximum Flap Extended Speed is the highest speed permissible with wing flaps in a prescribed extended position. |

| | |
|---------|--|
| VLE | Maximum landing gear extended speed is the maximum speed at which an airplane can be safely flown with the landing gear extended. |
| VLO | Maximum landing gear operating speed is the maximum speed at which the landing gear can be safely extended or retracted. |
| VNE/MNE | Never Exceed Speed is the speed limit that may not be exceeded at any time. |
| VNO/MNO | Maximum Structural Cruising Speed is the speed that should not be exceeded except in smooth air and then only with caution. |
| Vs | Stalling Speed or the minimum steady flight speed at which the airplane is controllable. |
| Vso | Stalling Speed or the minimum steady flight speed at which the airplane is controllable in the landing configuration. |
| Vx | Best Angle-of-Climb Speed is the airspeed which delivers the greatest gain of altitude in the shortest possible horizontal distance. |
| Vy | 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 (-0.00356°F) per foot and zero above that altitude. |
| OAT | Outside Air Temperature is the free air static temperature, obtained either from in-flight temperature indications adjusted for instrument error and compressibility effects or ground meteorological sources. |
| Flight in Icing Conditions | Flight when the OAT is 41°F (5°C) or colder, and in the presence of visible moisture. |
| Indicated Pressure Altitude | The number actually read from an altimeter when the barometric subscale has been set to 29.92 inches of mercury (1013.2 millibars). Position errors may be obtained from the Altimeter Correction graph. |
| Pressure Altitude | Altitude measured from standard sea level pressure (29.92 in. Hg) by a pressure or barometric altimeter. It is the indicated pressure altitude corrected for position |

and instrument error. In this handbook, altimeter instrument errors are assumed to be zero.

Station Pressure Actual atmospheric pressure at field elevation.

Wind The wind velocities recorded as variables on the charts of this handbook are to be understood as the headwind or tailwind components of the reported winds.

POWER TERMINOLOGY

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

Cruise Climb Power recommended for cruise climb.

Critical Altitude The altitude for a given rpm where the desired manifold pressure can no longer be maintained.

ENGINE CONTROLS AND INSTRUMENTS TERMINOLOGY

Throttle Control The lever used to control the forced introduction of a fuel-air mixture into the intake passages of an engine.

Propeller Control This lever requests the governor to maintain rpm at a selected value and, in the maximum decrease rpm position, feathers the propellers.

Section I General

BEECHCRAFT Baron 58P

| | |
|---|---|
| Mixture Control | 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. |
| Propeller Governor | This governor maintains the selected rpm requested by the propeller control lever. |
| Manifold Pressure Gage | An instrument that measures the absolute pressure in the intake manifold of an engine, expressed in inches of mercury (in. Hg). |
| Tachometer | An instrument that indicates the rotational speed of the propeller in revolutions per minute (rpm). |
| Turbine Inlet Temperature (TIT) Indicator | This instrument indicates the turbine inlet temperature and is used to establish the fuel mixture settings for cruise. |
| Turbo Supercharger | A turbine type compressor, driven by engine exhaust gases, that forces more air or fuel-air mixture into an internal combustion reciprocating engine than the engine would induct under the prevailing atmospheric pressures. |

AIRPLANE PERFORMANCE AND FLIGHT PLANNING TERMINOLOGY

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

| | |
|---------------------------------|--|
| Demonstrated Crosswind Velocity | The demonstrated crosswind velocity is the velocity of the crosswind component for which adequate control of the airplane during takeoff and landing was actually demonstrated during certification tests. The value shown is considered to be limiting. |
| Accelerate-Stop Distance | The distance required to accelerate an airplane to a specified speed and, assuming failure of an engine at the instant that speed is attained, to bring the airplane to a stop. |
| Accelerate-Go Distance | The distance required to accelerate an airplane to a specified speed and, assuming failure of an engine at the instant that speed is attained, feather inoperative propeller and continue takeoff on the remaining engine to a height of 50 ft. |
| MEA | Minimum Enroute IFR Altitude. |
| Route Segment | A part of a route. Each end of that part is identified by: (1) A geographical location; or (2) A point at which a definite radio fix can be established. |

WEIGHT AND BALANCE TERMINOLOGY

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

Section I
General

BEECHCRAFT
Baron 58P

| | |
|--------------------------|---|
| Basic Empty Weight | Standard empty weight plus optional equipment. |
| Usable Fuel | Fuel available for flight planning. |
| Unusable Fuel | Fuel remaining after a runout test has been completed in accordance with governmental regulations. |
| 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. |
| Maximum Zero Fuel Weight | Maximum weight exclusive of usable fuel. |
| Loading Condition | That combination of airplane weight and corresponding moment applicable to the various loadings computed for weight and balance purposes. |

| | |
|---------------------------------|---|
| 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 (CG) 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 (CG) | The point at which an airplane would balance if suspended. Its distance from the reference datum is found by dividing the total moment by the total weight of the airplane. |
| CG Arm | The arm obtained by adding the airplane's individual moments and dividing the sum by the total weight. |
| CG Limits | The extreme center of gravity locations within which the airplane must be operated at a given weight. |
| Tare | The apparent weight which may be indicated by a scales before any load is applied. |
| Leveling Points | Those points which are used during the weighing process to level the airplane. |

Section I
General

BEEHCRAFT
Baron 58P

Jack Points

Points on the airplane identified by the manufacturer as suitable for supporting the airplane for weighing or other purposes.

**Section II
Limitations
TABLE OF CONTENTS**

| <i>SUBJECT</i> | <i>PAGE</i> |
|---|--------------|
| Airspeed Limitations | 2-3 |
| Airspeed Indicator Markings | 2-4 |
| Power Plant Limitations | 2-4 |
| Engines..... | 2-4 |
| Fuel..... | 2-5 |
| Oil | 2-5 |
| Propellers | 2-5 |
| Starters | 2-6 |
| Power Plant Instrument Markings..... | 2-6 |
| Miscellaneous Instrument Markings..... | 2-7 |
| Weight Limits | 2-7 |
| Center of Gravity | 2-8 |
| Maneuvers..... | 2-8 |
| Flight Load Factors (6100 Pounds)..... | 2-9 |
| Minimum Flight Crew | 2-9 |
| Kinds of Operation | 2-9 |
| Required Equipment for Various Conditions of Flight | 2-9 |
| Fuel | 2-22 |
| Altitude Limitation | 2-22 |
| Cabin Pressurization..... | 2-22 |
| Maximum Passenger Seating Configuration | 2-22 |
| Seating..... | 2-22 |
| Icing Limitations | 2-22 |
| Limitations When Encountering Severe Icing Conditions (Required By FAA AD 98-04-24)..... | 2-22A |
| Structural Life | 2-23 |
| Placards..... | 2-23 |

THIS PAGE INTENTIONALLY LEFT BLANK

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

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

AIRSPEED LIMITATIONS

| SPEED | CAS | IAS | REMARKS |
|--|--|-------------------|--|
| | KTS | KTS | |
| Never Exceed VNE/MNE | 234 (Decrease 5 kts per 1000 ft above 16,000 ft) | 235 | Do Not Exceed This Speed in Any Operation. |
| Maximum Structural Cruising VNO/MNO | 195 (Decrease 4 kts per 1000 ft above 16,000 ft) | 196 | Do Not Exceed This Speed Except in Smooth Air and Then Only With Caution. |
| Maneuvering VA | 169 | 170 | Do Not Make Full or Abrupt Control Move- ments Above This Speed. |
| Above 23,000 ft | 160 | 161 | |
| Maximum Flap Extension/Extended VF and VFE (Approach 15°) Above 21,000 ft (Full Down 30°) | 175 160 140 | 177 162 143 | Do Not Extend or Operate With Flaps Extended Above This Speed. |
| Maximum Landing Gear Operating/Extended VLO and VLE Above 21,000 ft | 175 160 | 177 162 | Do Not Extend, Retract, or Operate With Gear Extended Above This Speed. |

Section II Limitations

BEECHCRAFT Baron 58P

*AIRSPEED INDICATOR MARKINGS

| MARK- ING | CAS VALUE OR RANGE | IAS VALUE OR RANGE | SIGNIFICANCE |
|-------------------|-----------------------|-----------------------|---|
| | KTS | KTS | |
| White Arc | 76-140 | 77-143 | Full Flap Operating Range |
| White Triangle | 175 | 177 | Maximum Flap Approach Posi- tion 15° |
| Blue Radial | 115 | 115 | Single-Engine Best Rate- of-Climb |
| Red Radial | 79 | 80 | Minimum Single-Engine Control (VMCA) |
| Green Arc | 80-195 | 79-196 | Normal Operat- ing Range |
| Yellow Arc | 195-234 | 196-235 | Operate With Caution, Only In Smooth Air |
| Red Radial | 234 | 235 | Maximum Speed For All Operations (Never Exceed) |

*The airspeed indicator is marked in IAS values.

POWER PLANT LIMITATIONS

ENGINES

■ Two Continental TSIO-520-L or TSIO-520-LB six-cylinder, horizontally opposed, fuel-injected, turbocharged engines.

Take-off and Maximum Continuous

Power..... 38.0 in. Hg at 2700 rpm

Do not lean mixture at power settings above 33 in. Hg and 2400 rpm.

Engine must be preheated before starting when ambient temperatures are below 10°F.

| | |
|---|---------|
| Maximum Turbine Inlet Temperature | 1650°F |
| Maximum Cylinder Head Temperature..... | 460°F |
| Maximum Oil Temperature | 240°F |
| Minimum Take-off Oil Temperature..... | 100°F |
| Minimum Oil Pressure (Idle) | 10 psi |
| Maximum Oil Pressure..... | 100 psi |

FUEL

Aviation Gasoline 100 LL (blue) or 100/130 (green) minimum grade; 115/145 (purple) Aviation Gasoline alternate grade.

OIL

Ashless Dispersant oils must meet Continental Motors Corporation Specification MHS-24A. Refer to Approved Engine Oils, Section VIII, SERVICING.

PROPELLERS

Two Hartzell constant speed, full feathering, three bladed propellers using PHC-J3YF-2F or PHC-J3YF-2UF hubs with FC7663DR or FC7663DRB blades and C3567-1P spinner assemblies; Pitch setting at 30-inch station: Low, 15.3°; Feathered, 84°; Diameter 78 inches, cut-off permitted to 77.5 inches.

STARTERS

When restarting an engine in flight do not use the starter above 20,000 feet.

POWER PLANT INSTRUMENT MARKINGS

Oil Temperature

Caution Range (Yellow Arc)50 to 100°F
Normal Operating Range (Green Arc)100 to 240°F
Maximum (Red Radial)240°F

Oil Pressure

Minimum Idle (Red Radial)10 psi
Caution Range (Yellow Arc)10 to 30 psi
Normal Operating Range (Green Arc)30 to 60 psi
Maximum (Red Radial)100 psi

Manifold Pressure

Normal Operating Range (Green Arc)14 to 38.0 in. Hg
Maximum (Red Radial)38.0 in. Hg

Tachometer

Normal Operating Range
(Green Arc)2000 to 2700 rpm
Maximum (Red Radial)2700 rpm

Cylinder Head Temperature

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

Turbine Inlet Temperature

Maximum (Red Radial)1650°F

MISCELLANEOUS INSTRUMENT MARKINGS

Instrument Pressure

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

Deice Pressure Gage

Normal Operating Range (Green Arc).....9.0 to 20.0 psi
Maximum (Red Radial)20.0 psi

NOTE

When surface deice system is not in operation,
Deice Pressure Gage should read approximate-
ly 4.5 to 5.5 psi.

Cabin Differential

Normal Operating Range
(Green Arc)0 to 3.7 psi
Maximum (Red Arc)above 3.7 psi

Propeller Deice Ammeter

Normal Operating Range (Green Arc)14 to 18 amps

Fuel Quantity

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

WEIGHT LIMITS

| | 58P | 58PA |
|--------------------------------|----------|----------|
| Maximum Take-off Weight..... | 6100 lbs | 5995 lbs |
| Maximum Landing Weight..... | 6100 lbs | 5995 lbs |
| Maximum Ramp Weight | 6140 lbs | 6035 lbs |
| Maximum Zero Fuel Weight | 5700 lbs | 5700 lbs |

Maximum Baggage Compartment Weights:

Nose Compartment.....300 lbs
Main Compartment.....400 lbs
Aft Compartment120 lbs

Refer to Weight and Balance section for additional
information.

CENTER OF GRAVITY (Landing Gear Extended)

58P

Forward Limits: 73 inches aft of datum at 5150 lbs and under, then straight line variation to 78.4 inches aft of datum at a weight of 6100 lbs.

58PA

Forward Limits: 73.0 inches aft of datum at 5150 lbs and under, then straight line variation to 77.8 inches aft of datum at a weight of 5995 lbs.

58P and 58PA

Aft Limit: 84.5 inches aft of datum at all weights.

Reference Datum: 83.1 inches forward of the center of front jack point.

MAC Leading Edge: 67.26 inches aft of datum.

MAC Length: 62.97 inches.

MANEUVERS

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

Maximum slip duration30 seconds

FLIGHT LOAD FACTORS (6100 POUNDS)

Positive maneuvering load factors:

| | |
|----------------------------|------|
| Flaps Up (0°) | 3.6G |
| Flaps Approach (15°) | 3.6G |
| Flaps Down (30°)..... | 2.0G |

MINIMUM FLIGHT CREWOne 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.
3. FAR 91 operations when all pertinent limitations and performance considerations are complied with.
4. Flight in icing conditions, only when equipped in accordance with information contained on Beech Drawing 102-000018 or Kit Drawing 102-5006.

REQUIRED EQUIPMENT FOR VARIOUS CONDITIONS OF FLIGHT

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

Section II Limitations

BEECHCRAFT Baron 58P

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 were 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.

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

NOTE

Flight in icing conditions prohibited unless the required equipment on the following tables is installed and operable.

INTENTIONALLY LEFT BLANK

Section II
Limitations

BEECHCRAFT
Baron 58P

| SYSTEM and/or COMPONENT | Number Installed | | | | | Remarks and/or Exceptions |
|---|------------------|---|---|---|---|--|
| | VFR Day | | | | | |
| | VFR Night | | | | | |
| | IFR Day | | | | | |
| | IFR Night | | | | | |
| Flight in Icing Conditions | | | | | | |
| ATA 100 CHAPTER 21 | | | | | | |
| AIR CONDITIONING | | | | | | |
| Pressurization controller | 1 | 1 | 1 | 1 | 1 | May be inoperative provided air-plane remains unpressurized. |
| Safety valve | 1 | 1 | 1 | 1 | 1 | |
| Outflow valve | 1 | 1 | 1 | 1 | 1 | |
| Altitude warning light | 1 | 1 | 1 | 1 | 1 | |
| Cabin rate-of-climb indicator | 1 | 1 | 1 | 1 | 1 | |
| Diff press/cabin altitude indicator | 1 | 1 | 1 | 1 | 1 | |
| Pressurization source | 2 | 1 | 1 | 1 | 1 | |
| Firewall shut-off valves | 2 | 2 | 2 | 2 | 2 | |
| Mechanical door safety lock (each door) | 1 | 1 | 1 | 1 | 1 | May be inoperative if pressure safety lock operable. |
| Pressure door safety lock (each door) | 1 | 1 | 1 | 1 | 1 | May be inoperative if mechanical safety lock operable. |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|--|
| ATA 100 CHAPTER 23 COMMUNICATIONS | | | | | | | | | | |
| VHF communications system | | | | | | | | | | |
| 2 | * | * | * | * | * | * | * | * | — | * Per FAR 91.33 |
| ATA 100 CHAPTER 24 ELECTRICAL POWER | | | | | | | | | | |
| Battery | | | | | | | | | | |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | — | |
| 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 | 2 | — | |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | — | |
| 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | — | One may be inoperative providing corresponding loadmeter is operative and monitored. |
| * | * | * | * | * | * | * | * | * | — | *Optional |
| ATA 100 CHAPTER 25 EQUIPMENT AND FURNISHINGS | | | | | | | | | | |
| Seat belts | | | | | | | | | | |
| * | * | * | * | * | * | * | * | * | — | * Per FAR 91.33 |
| * | * | * | * | * | * | * | * | * | — | * All forward facing seats. |
| 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | — | |
| Emergency locator transmitter | | | | | | | | | | |

Section II
Limitations

BEECHCRAFT
Baron 58P

| SYSTEM and/or COMPONENT | Number Installed | | | | | |
|---|----------------------------|---|---|---|---|---|
| | VFR Day | | | | | |
| | VFR Night | | | | | |
| | IFR Day | | | | | |
| | IFR Night | | | | | |
| | Flight in Icing Conditions | | | | | |
| | Remarks and/or Exceptions | | | | | |
| ATA 100 CHAPTER 26 FIRE PROTECTION | | | | | | |
| Portable fire extinguisher | * | * | * | * | * | * Optional |
| ATA 100 CHAPTER 27 FLIGHT CONTROLS | | | | | | |
| Trim tab indicators - Rudder aileron, and elevator | 3 | 3 | 3 | 3 | 3 | — May be inoperative provided that tabs are visually checked in the neutral position prior to each takeoff and checked for full range of operation. |

| | | | | | | | | |
|--|---|---|---|---|---|---|---|--|
| Flap position indicator | 1 | 1 | 1 | 1 | 1 | 1 | — | May be inoperative providing flap travel is visually inspected prior to takeoff. |
| Stall warning | 1 | 1 | 1 | 1 | 1 | 1 | — | |
| ATA 100 CHAPTER 28 FUEL EQUIPMENT | | | | | | | | |
| Engine driven boost pump | 2 | 2 | 2 | 2 | 2 | 2 | — | |
| Electrically driven boost pump | 2 | 2 | 2 | 2 | 2 | 2 | — | |
| Fuel quantity indicator | 2 | 2 | 2 | 2 | 2 | 2 | — | One may be inoperative provided other side is operational and amount of fuel on board can be established to be adequate for the intended flight. |
| Fuel flow indicator | 2 | 2 | 2 | 2 | 2 | 2 | — | One may be inoperative providing power is set using TIT system. |
| Fuel pressure warning light | 2 | 2 | 2 | 2 | 2 | 2 | — | |

Section II
Limitations

BEECHCRAFT
Baron 58P

| SYSTEM and/or COMPONENT | Number Installed | | | | | Remarks and/or Exceptions |
|---|------------------|---|---|---|---|--|
| | VFR Day | | | | | |
| | VFR Night | | | | | |
| | IFR Day | | | | | |
| | IFR Night | | | | | |
| Flight in Icing Conditions | | | | | | |
| ATA 100 CHAPTER 30 ICE AND RAIN PROTECTION | | | | | | |
| Alternate instrument air source | 1 | 1 | 1 | 1 | 1 | Left side must be operative. |
| Pitot heater(s) | 1(2) | - | 1 | 1 | 1 | |
| Fuel vent heaters | 2 | - | - | - | 2 | *Optional equipment |
| Surface deice (wings, hor. and vert stabilizers) | *1 | - | - | - | 1 | |
| Propeller deice (elec) | *1 | - | - | - | 1 | *Strength and location ap- proved for icing conditions. |
| Windshield anti-ice (elec) | *1 | - | - | - | 1 | |
| Stall warning heater | *1 | - | - | - | 1 | |
| Antenna(s) | * | - | - | - | * | |

| | | | | | | | |
|--|---|---|---|---|---|---|---|
| ATA 100 CHAPTER 32 LANDING GEAR | | | | | | | May be inoperative provided operations are continued only to a point where repairs can be accomplished. |
| | Landing gear motor | 1 | 1 | 1 | 1 | 1 | |
| | Landing gear position indication lights | 4 | 4 | 4 | 4 | 4 | |
| | Landing gear aural warning horn | 1 | 1 | 1 | 1 | 1 | |
| ATA 100 CHAPTER 33 LIGHTS | Cockpit and instrument lights | * | — | * | — | * | * Lights must illuminate all instruments and controls. |
| | Taxi light | 1 | — | — | — | — | |

Section II
Limitations

BEECHCRAFT
Baron 58P

| SYSTEM and/or COMPONENT | Number Installed | | | | | Remarks and/or Exceptions |
|-------------------------------|------------------|---|---|---|---|--|
| | VFR Day | | | | | |
| | VFR Night | | | | | |
| | IFR Day | | | | | |
| | IFR Night | | | | | |
| Landing light | 2 | — | * | — | — | * Per FAR 91.33 |
| Rotating beacon | 2 | — | 2 | — | — | |
| Strobe light | 3 | — | — | — | — | |
| Position light | 3 | — | 3 | — | — | |
| Cabin door caution light | 2 | 2 | 2 | 2 | 2 | May be inoperative provided doors are secured and visual indicators checked prior to each takeoff. |
| Wing ice light | *1 | — | — | — | * | *Optional (Required for night icing flight) |

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

**Section II
Limitations**

**BEECHCRAFT
Baron 58P**

| SYSTEM and/or COMPONENT | Number installed | | | | | | Remarks and/or Exceptions |
|---|------------------|---|---|---|---|---|---|
| | VFR Day | | | | | | |
| | VFR Night | | | | | | |
| | IFR Day | | | | | | |
| | IFR Night | | | | | | |
| Flight in Icing Conditions | | | | | | | |
| ATA 100 CHAPTER 37 VACUUM | | | | | | | |
| Instrument air source Instrument air indicator | 2 | — | 1 | 1 | 2 | — | * May be inoperative provided airplane remains unpressur- ized. |
| | 1 | * | 1 | 1 | 1 | — | |
| Vacuum system | 2 | * | 1 | 1 | 1 | — | * May be inoperative provided airplane remains unpressur- ized. |
| | *1 | * | * | * | 1 | — | |
| Deicing pressure indicator | | | | | | | * Optional (Required with surface deice system) |

| ATA 100 CHAPTER 77 ENGINE INDICATING INSTRUMENTS | |
|--|---|
| Engine tachometer | — |
| Turbine inlet temperature indicator | — |
| May be inoperative if fuel flow is set by increasing fuel flows listed in the Cruise Power tables by 1 gal/hr. Flight(s) may be continued to repair station. | |
| Manifold pressure indicator | — |
| Cylinder head temp gage | — |
| ATA 100 CHAPTER 79 ENGINE OIL INSTRUMENTS | |
| Oil pressure indicator | — |
| Oil temperature indicator | — |

FUEL

TOTAL FUEL with left and right wing fuel systems full:

Standard Fuel System

Capacity172 gallons
Usable166 gallons

Optional Fuel System

Capacity196 gallons
Usable190 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.

ALTITUDE LIMITATION25,000 feet

CABIN PRESSURIZATION

Maximum operating cabin pressure differential is 3.7 psi.

MAXIMUM PASSENGER SEATING CONFIGURATION

Five (5) passengers and one (1) pilot

SEATING

All occupied seats must be in the upright position for takeoff and landing and aft facing seats must have headrest fully extended.

ICING LIMITATIONS

Minimum Ambient Temperature
for Operation of Deicing Boots-40°C
Minimum Airspeed for Sustained Icing Flight130 knots

Sustained flight in icing conditions with flaps extended is prohibited except for approach and landings.

Windshield Electrothermal Anti-ice System (if installed) is limited to 10 minutes of ground operation.

LIMITATIONS WHEN ENCOUNTERING SEVERE ICING CONDITIONS (Required By FAA AD 98-04-24)

WARNING

Severe icing may result from environmental conditions outside of those for which the airplane is certificated. Flight in freezing rain, freezing drizzle, or mixed icing conditions (supercooled liquid water and ice crystals) may result in ice build-up on protected surfaces exceeding the capability of the ice protection system, or may result in ice forming aft of the protected surfaces. This ice may not be shed using the ice protection systems, and may seriously degrade the performance and controllability of the airplane.

1. During flight, severe icing conditions that exceed those for which the airplane is certificated shall be determined by the following visual cues. If one or more of these visual cues exists, immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the icing conditions.
 - a. Unusually extensive ice accumulation on the airframe and windshield in areas not normally observed to collect ice.
 - b. Accumulation of ice on the upper surface of the wing, aft of the protected area.
 - c. Accumulation of ice on the engine nacelles and propeller spinners farther aft than normally observed.
2. Since the autopilot, when installed and operating, may mask tactile cues that indicate adverse changes in handling characteristics, use of the autopilot is prohibited when any

of the visual cues specified above exist, or when unusual lateral trim requirements or autopilot trim warnings are encountered while the airplane is in icing conditions.

3. All wing icing inspection lights must be operative prior to flight into known or forecast icing conditions at night. [NOTE: This supersedes any relief provided by the Master Minimum Equipment List (MMEL).]

STRUCTURAL LIFE

Fuselage pressure vessel life limit10,000 hours
Wing and wing carry-thru life limit10,000 hours

PLACARDS

On Pilot's Left Sidewall Panel 58P (IAS):

| OPERATION LIMITATIONS | |
|---|---------------------|
| THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS. MAXIMUM WEIGHT IS 6100 LBS. | |
| THIS AIRPLANE IS APPROVED FOR VFR, IFR, DAY AND NIGHT OPERATION. THIS AIRPLANE IS NOT APPROVED FOR FLIGHT IN ICING CONDITIONS. | |
| NO AEROBATIC MANEUVERS, INCLUDING SPINS, APPROVED. | |
| OCCUPIED SEATS MUST BE IN THE UPRIGHT POSITION FOR TAKEOFF AND LANDING. | |
| AIRSPEEDS | |
| NEVER EXCEED | 235 KNOTS (270 MPH) |
| (DECREASE 5 KNOTS PER 1000 FT. ABOVE 16000 FT.) | |
| MAX. STRUCTURAL CRUISE | 196 KNOTS (226 MPH) |
| (DECREASE 4 KNOTS PER 1000 FT. ABOVE 16000 FT.) | |
| MAX. MANEUVERING | 170 KNOTS (196 MPH) |
| ABOVE 23000 FT. | 161 KNOTS (185 MPH) |
| MAX. APPROACH FLAPS (15°) | 177 KNOTS (204 MPH) |
| ABOVE 21000 FT. | 162 KNOTS (186 MPH) |
| MAX. FULL DOWN FLAPS (30°) | 143 KNOTS (165 MPH) |
| MAX. LANDING GEAR OPERATION | 177 KNOTS (204 MPH) |
| ABOVE 21000 FT. | 162 KNOTS (186 MPH) |

On Pilot's Left Sidewall Panel 58PA (IAS):

| OPERATION LIMITATIONS | |
|---|---------------------|
| THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS. MAXIMUM WEIGHT IS 5995 LBS. | |
| THIS AIRPLANE IS APPROVED FOR VFR, IFR, DAY AND NIGHT OPERATION. THIS AIRPLANE IS NOT APPROVED FOR FLIGHT IN ICING CONDITIONS. | |
| NO AEROBATIC MANEUVERS, INCLUDING SPINS, APPROVED. | |
| OCCUPIED SEATS MUST BE IN THE UPRIGHT POSITION FOR TAKEOFF AND LANDING. | |
| AIRSPEEDS | |
| NEVER EXCEED | 235 KNOTS (270 MPH) |
| (DECREASE 5 KNOTS PER 1000 FT. ABOVE 16000 FT.) | |
| MAX. STRUCTURAL CRUISE | 196 KNOTS (226 MPH) |
| (DECREASE 4 KNOTS PER 1000 FT. ABOVE 16000 FT.) | |
| MAX. MANEUVERING | 170 KNOTS (196 MPH) |
| ABOVE 23000 FT. | 161 KNOTS (185 MPH) |
| MAX. APPROACH FLAPS (15°) | 177 KNOTS (204 MPH) |
| ABOVE 21000 FT. | 162 KNOTS (186 MPH) |
| MAX. FULL DOWN FLAPS (30°) | 143 KNOTS (165 MPH) |
| MAX. LANDING GEAR OPERATION | 177 KNOTS (204 MPH) |
| ABOVE 21000 FT. | 162 KNOTS (186 MPH) |

PLACARDS (Continued)

58P On Pilot's Left Sidewall Panel (IAS):
(airplanes approved for flight in icing conditions)

| OPERATION LIMITATIONS | |
|---|---------------------|
| THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS. MAXIMUM WEIGHT IS 6100 LBS. THIS AIRPLANE IS APPROVED FOR VFR, IFR, DAY AND NIGHT OPERATION. THIS AIRPLANE IS APPROVED FOR FLIGHT IN ICING CONDITIONS. NO ACROBATIC MANEUVERS, INCLUDING SPINS, APPROVED. OCCUPIED SEATS MUST BE IN THE UPRIGHT POSITION FOR TAKEOFF AND LANDING. | |
| AIRSPEEDS | |
| NEVER EXCEED | 235 KNOTS (270 MPH) |
| (DECREASE 5 KNOTS PER 1000 FT. ABOVE 16000 FT.) | |
| MAX. STRUCTURAL CRUISE | 196 KNOTS (226 MPH) |
| (DECREASE 4 KNOTS PER 1000 FT. ABOVE 16000 FT.) | |
| MAX. MANEUVERING | 170 KNOTS (196 MPH) |
| ABOVE 23000 FT. ----- 161 KNOTS (185 MPH) | |
| MAX. APPROACH FLAPS (15°) | 177 KNOTS (204 MPH) |
| ABOVE 21000 FT. ----- 162 KNOTS (186 MPH) | |
| MAX. FULL DOWN FLAPS (30°) | 143 KNOTS (165 MPH) |
| MAX. LANDING GEAR OPERATION | 177 KNOTS (204 MPH) |
| ABOVE 21000 FT. ----- 162 KNOTS (186 MPH) | |

58PA On Pilot's Left Sidewall Panel (IAS):
(airplanes approved for flight in icing conditions)

| OPERATION LIMITATIONS | |
|---|---------------------|
| THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH THE OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS. MAXIMUM WEIGHT IS 5995 LBS. THIS AIRPLANE IS APPROVED FOR VFR, IFR, DAY AND NIGHT OPERATION. THIS AIRPLANE IS APPROVED FOR FLIGHT IN ICING CONDITIONS. NO ACROBATIC MANEUVERS, INCLUDING SPINS, APPROVED. OCCUPIED SEATS MUST BE IN THE UPRIGHT POSITION FOR TAKEOFF AND LANDING. | |
| AIRSPEEDS | |
| NEVER EXCEED | 235 KNOTS (270 MPH) |
| (DECREASE 5 KNOTS PER 1000 FT. ABOVE 16000 FT.) | |
| MAX. STRUCTURAL CRUISE | 196 KNOTS (226 MPH) |
| (DECREASE 4 KNOTS PER 1000 FT. ABOVE 16000 FT.) | |
| MAX. MANEUVERING | 170 KNOTS (196 MPH) |
| ABOVE 23000 FT. ----- 161 KNOTS (185 MPH) | |
| MAX. APPROACH FLAPS (15°) | 177 KNOTS (204 MPH) |
| ABOVE 21000 FT. ----- 162 KNOTS (186 MPH) | |
| MAX. FULL DOWN FLAPS (30°) | 143 KNOTS (165 MPH) |
| MAX. LANDING GEAR OPERATION | 177 KNOTS (204 MPH) |
| ABOVE 21000 FT. ----- 162 KNOTS (186 MPH) | |

On Left Windshield Post When Heated Windshield is Installed:



On Top of Front Spar Carry-thru Structure Between Front Seats:



On Landing Gear Crank Access Cover:

LANDING GEAR
EMERGENCY CRANK

PULL OUT
LIFT UP

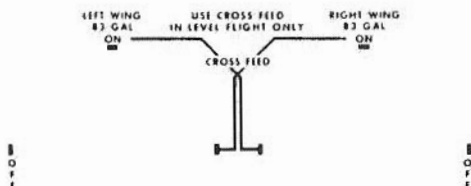
PLACARDS (Continued)

For Standard 166-Gal Fuel System
Adjacent to Fuel Quantity Indicators:

FULL FUEL 83 GAL

Between Fuel Selector Handles:

FUEL SELECTOR



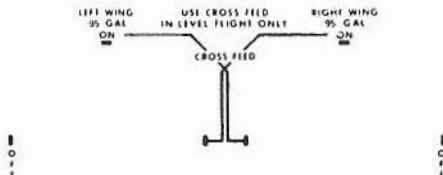
**DO NOT TAKE OFF IF FUEL QUANTITY GAGES
INDICATE IN YELLOW ARC OR WITH LESS
THAN 13 GALLONS IN EACH WING SYSTEM**

For Optional 190-Gal Fuel System
Adjacent to Fuel Quantity Indicators:

FULL FUEL 95 GAL

Between Fuel Selector Handles:

FUEL SELECTOR



**DO NOT TAKE OFF IF FUEL QUANTITY GAGES
INDICATE IN YELLOW ARC OR WITH LESS
THAN 13 GALLONS IN EACH WING SYSTEM**

**Temporary Change
to the
Pilot's Operating Handbook
and
FAA Approved Airplane Flight Manual
P/N 102-590000-31TC1**

| | |
|---|---|
| Publication Affected | 58P and 58PA Pilot's Operating Handbook and FAA Approved Airplane Flight Manual (P/N 102-590000-31, Issued October, 1976 or Subsequent) |
| Airplane Serial Numbers Affected | TJ-46, TJ-55, TJ-83, TJ-85 thru TJ-168 |
| Description of Change | The addition of a placard to the fuel selectors to warn of the no-flow condition that exists between the fuel selector detents. |
| Filing Instructions | Insert this temporary change into the 58P and 58PA Pilot's Operating Handbook and FAA Approved Airplane Flight Manual immediately following page 2-26 (Section II, LIMITATIONS) and retain until rescinded or replaced. |

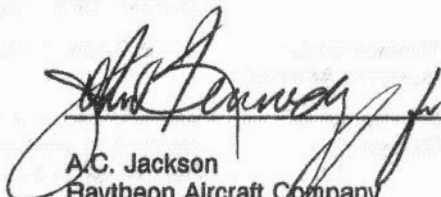
LIMITATIONS

PLACARDS

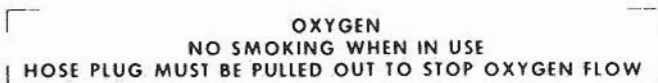
*Located On The Face Of The Fuel Selector Valves, For Those
Airplanes In Compliance With S.B. 2670:*

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

Approved:


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

On Oxygen Panel on Left Sidewall:



Around Each Oxygen Outlet:



Adjacent to Oxygen Outlet when 5th & 6th Seats are Installed:



On Each Oxygen Mask Stowage Container:

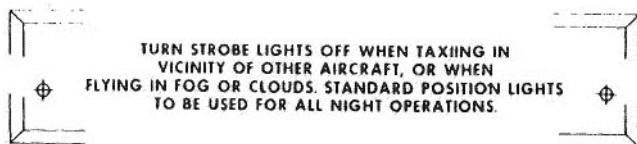
OXYGEN MASK

PLACARDS (Continued)

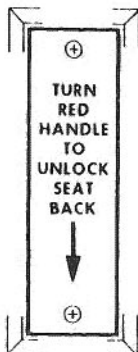
On Instrument Panel Adjacent to Airspeed Indicator:

**SEE AIRSPEED LIMITATIONS
PLACARD FOR VARIATION
WITH ALTITUDE**

On Left Side Panel:



On Inboard Side of 3rd & 4th Seat Backs:



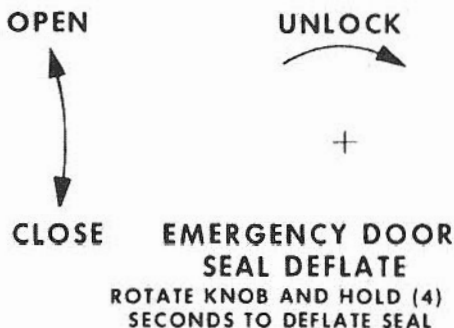
On Forward Spar Cover:



Adjacent to Forward Cabin Door Handle:

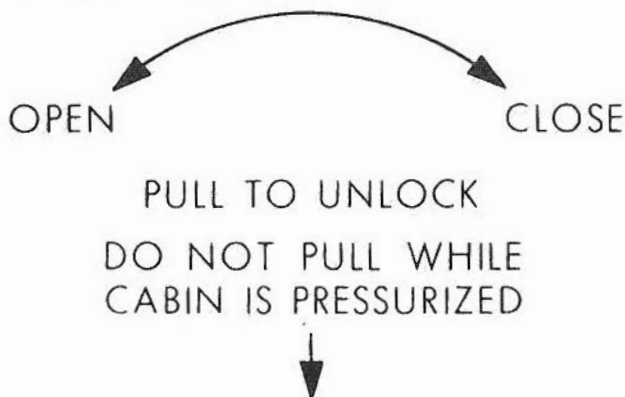


Adjacent to Forward Cabin Door Handle (When Kit No. 102-4006-1S is Installed):



PLACARDS (Continued)

Adjacent to Aft Cabin Door Handle:



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

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

Adjacent to Pilot's and Copilot's Seat:

SHOULDER HARNESS
MUST BE WORN AT
ALL TIMES WHILE AT
PILOT POSITIONS

Adjacent to 5th and 6th Seats and 3rd and 4th Forward Facing Seats:



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

On Left Aft Cabin Sidewall:

| | | |
|---|--------------------------------------|---|
| | BAGGAGE COMPARTMENTS | |
| | LOAD IN ACCORDANCE WITH | |
| ⊕ | WEIGHT AND BALANCE DATA | ⊕ |
| | MAXIMUM STRUCTURAL CAPACITY | |
| | MAIN COMPARTMENT - 400 POUNDS | |
| | AFT COMPARTMENT - 120 POUNDS | |

In Full View When Nose Baggage Compartment Door is Open:

| | | |
|---|---|---|
| | BAGGAGE COMPARTMENT | |
| ⊕ | LOAD IN ACCORDANCE WITH | ⊕ |
| | WEIGHT AND BALANCE DATA | |
| | MAXIMUM STRUCTURAL CAPACITY - 300 POUNDS | |

On the Glare Shield:



**AIRPLANES EQUIPPED WITH WINDSHIELD ALCOHOL
NOT APPROVED FOR FLIGHT IN ICING CONDITIONS**



Section III

Emergency Procedures

TABLE OF CONTENTS

| <i>SUBJECT</i> | <i>PAGE</i> |
|---|-------------|
| Emergency Airspeeds | 3-3 |
| Determining Inoperative Engine | 3-3 |
| One-Engine Inoperative Procedures | 3-4 |
| Engine Failure During Ground Roll..... | 3-4 |
| Engine Failure After Lift-off and in Flight | 3-4 |
| Air Start | 3-5 |
| Engine Fire (Ground) | 3-7 |
| Engine Fire in Flight | 3-7 |
| Emergency Descent | 3-7 |
| Glide | 3-8 |
| Landing Emergencies | 3-8 |
| Gear Up Landing | 3-8 |
| One-Engine Inoperative Landing | 3-9 |
| One-Engine Inoperative Go-Around | 3-9 |
| Systems Emergencies | 3-10 |
| One-Engine Inoperative Operation | |
| on Crossfeed..... | 3-10 |
| Electrical Smoke or Fire | 3-10 |
| Alternator-Out Procedure | 3-11 |
| Alternate Battery Bus..... | 3-12 |
| Unscheduled Electric Elevator Trim | 3-12 |
| Landing Gear Manual Extension | 3-13 |
| Landing Gear Retraction After | |
| Practice Manual Extension | 3-14 |
| Pressurization System..... | 3-14 |
| Loss of Pressurization | 3-15 |
| Ice Protection..... | 3-16 |
| Surface Deice System..... | 3-16 |
| Electrothermal Propeller Deice System..... | 3-16 |
| Alternate Instrument Air Source | 3-17 |

Section III
Emergency Procedures
TABLE OF CONTENTS (Cont'd)

| <i>SUBJECT</i> | <i>PAGE</i> |
|--|-------------|
| Severe Icing Conditions (Alternate Method Of Compliance With FAA AD 98-04-24) | 3-18 |
| Emergency Exit..... | 3-19 |
| Turbocharger System Failures | 3-20 |
| Simulated One-Engine-Inoperative | 3-22 |
| Spins | 3-22 |

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

EMERGENCY AIRSPEEDS

Minimum Control Speed (V_{MCA}) 80 KTS

Recommended Safe One Engine
Inoperative Speed (V_{SSE}) 86 KTS

Best Rate-of-Climb Speed
One-Engine Inoperative (V_r) 115 KTS

Best Angle-of-Climb Speed
One-Engine Inoperative (V_x) 102 KTS

Landing — One Engine Inoperative:

Maneuvering to Final Approach 110 KTS (Minimum)

Final Approach 100 KTS (Minimum)

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.

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 operative 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

ENGINE FAILURE DURING GROUND ROLL

1. Throttles — CLOSED
2. Braking — MAXIMUM
3. Fuel Selectors — OFF
4. Battery, Alternator, and Magneto/Start Switches — OFF

NOTE

Braking effectiveness is improved if the brakes are not locked.

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 80 knots, reduce power on operative engine as required to maintain control.

An immediate landing is advisable regardless of take-off weight. Continued flight can not 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 — AT OR ABOVE THE 50 FT TAKE-OFF SPEED

After positive control of the airplane is established:

6. Secure inoperative engine:
 - a. Mixture Control — IDLE CUT-OFF
 - b. Fuel Selector — OFF
 - c. Fuel Boost Pump — OFF
 - d. Magneto/Start Switch — OFF
 - e. Alternator Switch — OFF
 - f. Cowl Flap — CLOSED
 - g. Cabin Press Air Shutoff Control — PULL CLOSED
7. Electrical Load — MONITOR (Maximum load of 1.0 on remaining engine)
8. Air Cond/Press Air Cool Switch — OFF

AIR START

CAUTION

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

Do not use engine starter above 20,000 feet.

Section III
Emergency Procedures

BEECHCRAFT
Baron 58P

1. Mixture — IDLE CUT-OFF
2. Fuel Selector — ON
3. Fuel Boost Pump — ON
4. Magneto/Start Switches — ON BOTH
5. Throttle — NORMAL START POSITION (½ Open)
6. Primer — MIXTURE FULL RICH then IDLE CUT-OFF
7. Cabin Press Air Shut-off Valve — PULL CLOSED
8. Propeller:

WITH UNFEATHERING ACCUMULATORS:

- a. Propeller Control — FORWARD OF FEATHERING DETENT UNTIL ENGINE ATTAINS 600 RPM; THEN BACK TO DETENT
- b. Oil Pressure — STABILIZED

If propeller does not unfeather or the engine does not turn, proceed to WITHOUT UNFEATHERING ACCUMULATORS procedure.

- c. Mixture — FULL RICH AT 1000 RPM

WITHOUT UNFEATHERING ACCUMULATORS:

- a. Propeller Control — MOVE FORWARD OF THE FEATHERING DETENT TO MID-RANGE
- b. Magneto/Start Switch — START (hold until windmilling begins)
- c. Mixture — FORWARD AS ENGINE STARTS

If air start is unsuccessful, return the propeller control to the feather position and secure the engine.

9. Throttle — AS NECESSARY TO PREVENT OVER-SPEED; warm up at 15 in. Hg manifold pressure.
10. Oil Pressure, Oil and Cylinder Head Temperatures — NORMAL INDICATION
11. Alternator Switch — ON
12. Power — AS REQUIRED
13. Cabin Press Air Shut-off Valve — PUSH OPEN (after engine is running smoothly)

ENGINE FIRE (GROUND)

1. Mixture Controls — IDLE CUT-OFF
2. Continue to crank affected engine
3. Fuel Selectors — OFF
4. Throttle — FULL OPEN
5. Battery and Alternator Switches — OFF
6. Air Cond/Press Air Cool Switch — OFF
7. Cabin Press Air Shutoff Control — PULL CLOSED
8. Shut-down other engine
9. Extinguish fire with 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 — OFF
2. Mixture Control — IDLE CUT-OFF
3. Propeller — FEATHERED
4. Cabin Press Air Shutoff Control — PULL
5. Fuel Boost Pump — OFF
6. Magneto/Start Switch — OFF
7. Alternator Switch — OFF
8. Oxygen — AS REQUIRED
9. Air Cond/Press Air Cool Switch — OFF

EMERGENCY DESCENT

1. Propellers — 2700 RPM
2. Throttles — CLOSED
3. Airspeed — 175 KTS (below 21,000 feet)
4. Landing Gear — DOWN
5. Flaps — APPROACH (15°)
6. Oxygen — AS REQUIRED

NOTE

Time to descend from 25,000 ft to 10,000 ft is less than 4 minutes.

GLIDE

1. Propellers — FEATHER
2. Flaps — UP (0°)
3. Landing Gear — UP
4. Cowl Flaps — CLOSED
5. Air Cond/Press Air Cool Switch — OFF
6. Airspeed — 122 KTS

The glide ratio in this configuration is approximately 1.5 nautical miles of gliding distance for each 1000 feet of altitude above the terrain.

LANDING EMERGENCIES

GEAR UP LANDING

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

1. Cowl Flaps — CLOSED
2. Wing Flaps — DOWN (30°)
3. Throttles — CLOSED
4. Mixture Controls — IDLE CUT-OFF
5. Battery, Alternator, and Magneto/Start Switches — OFF
6. Fuel Selectors — 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 — 100 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 may 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 100 KTS MINIMUM.

SYSTEMS EMERGENCIES

ONE-ENGINE INOPERATIVE OPERATION ON CROSSFEED

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

Left engine inoperative:

1. Left Fuel Boost Pump — ON
2. Left Fuel Selector — OFF
3. Right Fuel Selector — CROSSFEED
4. Right Fuel Boost Pump — OFF

Right engine inoperative:

1. Right Fuel Boost Pump — ON
2. Right Fuel Selector — OFF
3. Left Fuel Selector — CROSSFEED
4. Left Fuel Boost Pump — OFF

ELECTRICAL SMOKE OR FIRE

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

1. Alternator Switches - OFF
2. Battery Switch - OFF

WARNING

Electrically driven flight/engine instruments and stall warning speaker will become inoperative.

3. Oxygen — AS REQUIRED
4. All Electrical Switches — OFF
5. Battery Switch - ON
6. Alternator Switches - ON

7. 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 PRESS AIR SHUTOFF controls. To evacuate smoke, the cabin pressure and door seal pressure should be dumped, if required.

ALTERNATOR-OUT PROCEDURE

Illumination of a Single Alternator Annunciator:

1. Verify alternator out with respective loadmeter - will show zero output.

NOTE

If the loadmeter does not show zero output, a malfunction in the annunciator light system is indicated, and the alternator switch should be left ON.

2. If loadmeter shows zero output, Alternator Switch - OFF MOMENTARILY, THEN ON (this resets the overvoltage relay)

If annunciator does not illuminate, continue to use the alternator.

3. If annunciator illuminates and there is no load indication, turn Alternator Switch - OFF
4. Nonessential Electrical Equipment - OFF. Reduce load to single alternator capacity.

Illumination of Second Alternator Annunciator:

1. Repeat steps 1 thru 3 above.
2. Nonessential Electrical Equipment - OFF (to conserve battery power)

ALTERNATE BATTERY BUS

In the event of a dual alternator failure:

1. Remove guard and turn on the ALT BAT BUS switch.
2. Alternator Switches - OFF
3. Battery Switch - OFF

The following items are thus provided from battery power:

1. Turn and Slip Indicator
2. Navigation Lights
3. Instrument Lights
4. Cabin Lights
5. Left Landing Light
6. Audio
7. Com 1
8. Nav 1 (Nav 2 only, if installed)
9. Transponder

NOTE

The standard battery installation will provide 30 minutes of operation or more, according to the number of above loads used.

UNSCHEDULED ELECTRIC ELEVATOR TRIM

Incorporated in the system is an emergency release button located on the left handle grip of the pilot's control wheel. This button can be depressed to deactivate the system quickly in case of a malfunction in the system. The system will remain deactivated only while the release button is being held in the depressed position.

1. Airplane Attitude — MAINTAIN using elevator control.
2. Trim Release (under pilot's thumb adjacent to control wheel trim switch) — HOLD IN DEPRESSED POSITION.
3. Trim — MANUALLY RETRIM AIRPLANE
4. Electric Trim — OFF
5. Trim Release — RELEASE
6. Circuit Breaker — PULL

NOTE

Do not attempt to operate the electric trim system until the cause of the malfunction has been determined and corrected.

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 position
3. Remove cover at rear of front seats. Engage handcrank and turn counterclockwise as far as possible (approximately 50 turns). **Slow handcrank.**
4. If electrical system is operative, check landing gear position lights 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.

WARNING

After emergency landing gear extension, do not 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 can only be retracted electrically, as follows:

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

PRESSURIZATION SYSTEM

Any time the differential pressure goes into the red arc, either reschedule the cabin altitude or select the DUMP position on the Cabin Pressure Switch.

CAUTION

Idle power on both engines will cause a reduction of pressurization. Don oxygen masks as required.

The following table sets forth the average time of Useful Consciousness (time from onset of hypoxia until loss of effective performance at various altitudes).

| | |
|------------------------|-----------------|
| 25,000 ft MSL | 3 to 5 minutes |
| 22,000 ft MSL | 5 to 10 minutes |
| 12-18,000 ft MSL | 30 min. or more |

LOSS OF PRESSURIZATION

Illumination of Cabin Altitude Warning Light:

1. In the event of pressurization loss at high altitude, USE OXYGEN OR DESCEND AS REQUIRED.

Illumination of Cabin Door Ajar Lights:

WARNING

If cabin is pressurized and door is not completely latched, any movement of the door handle toward the unlocked position may cause loss of pressurization and opening of the door.

1. If either cabin door ajar light on the annunciator panel indicates that a cabin door may not be secure, depressurize cabin (consider altitude before depressurizing cabin).
2. Do not attempt to check cabin doors for security until cabin is depressurized and airplane is on the ground.

Illumination of Cabin Door Seal Warning Light:

1. If LOW PRESS light remains illuminated, actuate door seal standby system.

NOTE

If the low pressure light is inoperative (burned out, etc.), the need for the door seal standby system may be determined by listening for air leaks around the door and checking for loss of pressurization.

- a. With primary system door seal switch in INFL position manually operate air valve placarded DOOR SEAL STANDBY SYSTEM - PULL UP FOR ON located on left side panel.
- b. Momentarily actuate DOOR SEAL STANDBY SWITCH no longer than 5 seconds at 5 minute intervals to inflate door seal.

c. Descend immediately to altitude not requiring pressurization.

ICE PROTECTION

SURFACE DEICE SYSTEM

Boots will not deflate:

- Surface Deice Switch - MAN OFF (then release)

If deice boots fail to operate properly:

- Leave icing conditions as soon as possible.

ELECTROTHERMAL PROPELLER DEICE SYSTEM

Loss of one alternator: turn off unnecessary electrical equipment. 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 (Normal Operation - 14 to 18 amps):

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.

Zero to 14 Amps:

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

18 to 23 Amps:

If the prop deicing system ammeter occasionally or regularly indicates more than 18 but less than 23 amps, operation of the prop deice system can continue unless serious propeller imbalance results from irregular ice throw-offs.

More than 23 Amps:

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

ALTERNATE INSTRUMENT AIR SOURCE

THE ALTERNATE INSTRUMENT AIR SOURCE SHOULD BE USED FOR CONDITIONS WHERE THE NORMAL INSTRUMENT AIR 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 the suspected obstruction is possible by switching to the alternate system and noting a sudden sustained change in rate of climb. This may be accompanied by abnormal indicated air-speed and altitude changes beyond normal calibration differences.

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

1. Instrument Air - Switch to ALTERNATE (forward side front spar cover)
2. For Airspeed Calibration and Altimeter Corrections, refer to Section V, PERFORMANCE.

NOTE

Place the Instrument Air switch in the NORMAL position when the Alternate system is not needed.

SEVERE ICING CONDITIONS

(Alternate Method Of Compliance With FAA AD 98-04-24)

THE FOLLOWING WEATHER CONDITIONS MAY BE CONDUCTIVE TO SEVERE IN-FLIGHT ICING:

- Visible rain at temperatures below 0 degrees Celsius ambient air temperature.
- Droplets that splash or splatter on impact at temperatures below 0 degrees Celsius ambient air temperature.

PROCEDURES FOR EXITING THE SEVERE ICING ENVIRONMENT:

These procedures are applicable to all flight phases from takeoff to landing. Monitor the ambient air temperature. While severe icing may form at temperatures as cold as -18 degrees Celsius, increased vigilance is warranted at temperatures around freezing with visible moisture present. If the visual cues specified in the Limitations Section for identifying severe icing conditions are observed, accomplish the following:

1. Immediately request priority handling from Air Traffic Control to facilitate a route or an altitude change to exit the severe icing conditions in order to avoid extended exposure to flight conditions more severe than those for which the airplane has been certificated.
2. Avoid abrupt and excessive maneuvering that may exacerbate control difficulties.
3. Do not engage the autopilot.

4. If the autopilot is engaged, hold the control wheel firmly and disengage the autopilot.
5. If an unusual roll response or uncommanded roll control movement is observed, reduce the angle-of-attack.
6. Do not extend flaps when holding in icing conditions. Operation with flaps extended can result in a reduced wing angle-of-attack, with the possibility of ice forming on the upper surface further aft on the wing than normal, possibly aft of the protected area.
7. If the flaps are extended, do not retract them until the airframe is clear of ice.
8. Report these weather conditions to Air Traffic Control.

EMERGENCY EXIT

The forward and/or the aft cabin door is available for emergency exit.

Deflate forward door seal before landing.

DOOR SEAL-INFL-DEFL switch - DEFL

NOTE

In case of airplane electrical failure, actuate and hold the EMERGENCY DOOR SEAL DEFLATE valve, located on the forward cabin door upholstery panel, or copilot's subpanel for approximately 4 seconds.

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.

TURBOCHARGER SYSTEM FAILURES

WARNING

Treat all suspected turbocharger failures as serious situations, with engine failure and/or fire as an eventual possibility.

A failure in one or more of the following components is considered to be a failure of the turbocharger system:

- The turbocharger (turbine or compressor)
- The wastegate or its actuator
- The variable absolute pressure controller
- The overboost valve
- Associated oil supply lines
- Induction air ducts
- Exhaust pipes

One or more of the following symptoms may be associated with a failure of the turbocharger system:

- A partial loss of engine power
- A complete loss of engine power
- Manifold pressure indications inconsistent with throttle position (either higher or lower than normal)
- Smoke or fumes in the cabin
- Fire in the engine compartment
- Abnormally low oil pressure

1. Suspected failure of the turbocharger system on the ground:

- DO NOT TAKEOFF

2. Suspected failure of the turbocharger system in flight:
 - a. Complete loss of power, or Evidence of Smoke, Fumes, or Fire.

NOTE

Large, sudden power reductions at altitude with rich mixtures can cause loss of engine power. Such occurrences should not be confused with a failure in the turbocharger system.

- 1) Shut Down or Secure the affected engine using the Engine Fire In Flight Procedure.
- 2) Land at the nearest suitable airport.
- b. Partial loss of power - The manifold pressure will be abnormally low when compared to the throttle setting. The engine may run rough and back-fire.
 - 1) Throttle and Mixture - Adjust as required to smooth-out engine roughness as much as possible. The mixture may have to be adjusted with each change in throttle position.
 - 2) Land at the nearest suitable airport.
- c. Manifold Pressure abnormally high when compared to throttle position:
 - 1) Throttle - Retard to maintain manifold pressure within limits.
 - 2) Land at the nearest suitable airport.

SIMULATED ONE-ENGINE-INOPERATIVE

ZERO THRUST (Simulated Feather)

Use the following power setting (only on one engine at a time) to establish zero thrust. Use of this power setting avoids the difficulties of restarting an engine and preserves the availability of power to counter potential hazards.

The following procedure should be accomplished by alternating small reductions of propeller and then throttle, until the desired setting has been reached.

1. Propeller Lever - RETARD TO FEATHER DETENT.
2. Throttle Lever - SET 9 in. Hg MANIFOLD PRESSURE.

NOTE

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

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 continue 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 class; therefore, no spin tests have been conducted. The recovery technique is based on the best available information.

SECTION IV

NORMAL PROCEDURES

TABLE OF CONTENTS

| <i>SUBJECT</i> | <i>PAGE</i> |
|--|-------------|
| Speeds for Safe Operation | 4-3 |
| Preflight Inspection | 4-4 |
| Before Starting | 4-7 |
| Starting | 4-8 |
| After Starting and Taxi | 4-9 |
| Before Take-Off | 4-10 |
| Take-Off | 4-11 |
| Maximum Performance Climb | 4-11 |
| Cruise Climb | 4-12 |
| Cruise | 4-12 |
| Leaning Mixture Using TIT | 4-13 |
| Descent | 4-13 |
| Before Landing | 4-13 |
| Balked Landing | 4-14 |
| After Landing | 4-14 |
| Shutdown | 4-15 |
| Environmental Controls | 4-15 |
| Pressurization System | 4-15 |
| Oxygen System | 4-16 |
| Electric Elevator Trim | 4-19 |
| Cold Weather Operation | 4-19 |
| Preflight Inspection | 4-19 |
| Engines | 4-20 |
| External Power | 4-21 |
| Starting Engines Using Auxiliary Power Unit | 4-22 |
| Taxiing | 4-22 |

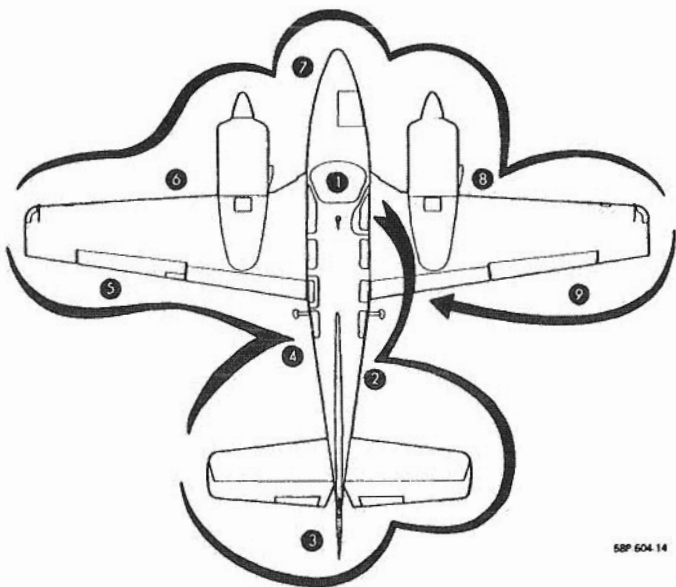
TABLE OF CONTENTS (Continued)

| <i>SUBJECT</i> | <i>PAGE</i> |
|---|-------------|
| Icing Flight | 4-22 |
| Surface Deice System | 4-23 |
| Electrothermal Propeller Deice | 4-25 |
| Windshield Anti-Ice System (Electrothermal) | 4-26 |
| Windshield Anti-Ice System (Fluid Flow) | 4-27 |
| Pitot Heat and Heated Stall | |
| Warning | 4-27 |
| Heated Fuel Vents | 4-28 |
| Windshield Defogging | 4-28 |
| Wing Ice Light | 4-28 |
| Practice Demonstration of V_{MCA} | 4-29 |

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

SPEEDS FOR SAFE OPERATION

| | |
|--|---------|
| Two-Engine Best Angle-of-Climb | 95 kts |
| Two-Engine Best Rate-of-Climb | 115 kts |
| Landing Approach | |
| Flaps 30° | 100 kts |
| Flaps 0° | 104 kts |
| Balked Landing Climb | 92 kts |
| Demonstrated Crosswind Component | 30 kts |
| Turbulent Air Penetration | 170 kts |
| Cruise Climb: | |
| SL - 25,000 feet | 130 kts |



58P 504 14

PREFLIGHT INSPECTION

1. COCKPIT

- a. Control Locks — REMOVE AND STOW
- b. Parking Brake — SET
- c. All Switches — OFF
- d. Trim Tabs — SET TO ZERO
- e. Oxygen — CHECK

2. FUSELAGE RIGHT SIDE

- a. Static Port — CLEAR OF OBSTRUCTIONS
- b. 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

4. FUSELAGE LEFT SIDE

- a. Static Port — CLEAR OF OBSTRUCTIONS
- b. All Antennas and Lower Beacon — CHECK
- c. Static Air Drain — DRAIN AND CLOSE
- d. Load Distribution — CHECK
- e. Cabin Door — CHECK SECURE

5. LEFT WING TRAILING EDGE

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

6. LEFT WING LEADING EDGE

- a. Navigation Light, Wing Tip Landing Light (if installed), and Deice Boot — CHECK FOR CONDITION
- b. Stall Warning Vane — CHECK FREEDOM OF MOVEMENT
- c. Fuel — DEPRESS FLAPPER, CHECK QUANTITY, AND SECURE CAP(S). ALWAYS CHECK WING TIP TANK FIRST (IF INSTALLED); DO NOT REMOVE INBOARD CAP IF FUEL IS VISIBLE IN TIP TANK.
- d. Wing Tip Tank (if installed) Sump — DRAIN
- e. Fuel Sight Gage — CHECK (if installed)
- f. Tie Down, Chocks — REMOVE
- g. Engine Oil — CHECK QUANTITY, CAP AND DOOR SECURE
- h. Engine Cowling and Doors — CHECK CONDITION AND SECURITY
- i. Landing Light (if installed) — CHECK
- j. Engine Air Openings — EXAMINE FOR OBSTRUCTIONS (6 places)
- 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 and Downlock Mechanism — CHECK CONDITION
- o. Fuel Sump — DRAIN
- p. Fuel Strainer — DRAIN

7. NOSE SECTION

- a. Wheel Well Doors, Tire and Shock Strut — CHECK
- b. Pitot(s) — REMOVE COVER, EXAMINE FOR OBSTRUCTIONS
- c. Taxi Light — CHECK
- d. Baggage Door — SECURE
- e. Nose Cone — CHECK
- f. Windshield — CHECK CONDITION

8. RIGHT WING LEADING EDGE

- a. Wheel Well Doors, Tire, Brake Line, and Shock Strut — CHECK
- b. Landing Gear Uplock Roller and Downlock Mechanism — CHECK CONDITION
- c. Cowl Flap — CHECK
- d. Fuel Sump — DRAIN
- e. Fuel Strainer — DRAIN
- f. Engine Oil — CHECK QUANTITY, CAP AND DOOR SECURE
- g. Engine Cowling and Doors — CHECK CONDITION AND SECURITY
- h. Landing Light (if installed) —CHECK
- i. Propeller — EXAMINE FOR NICKS, SECURITY AND OIL LEAKS
- j. Engine Air Openings — EXAMINE FOR OBSTRUCTIONS (6 places)
- k. Fuel Sight Gage — CHECK (if installed)
- l. Fuel — DEPRESS FLAPPER, CHECK QUANTITY, AND SECURE CAP(S). ALWAYS CHECK WING TIP TANK FIRST (IF INSTALLED); DO NOT REMOVE INBOARD CAP IF FUEL IS VISIBLE IN TIP TANK.
- m. Wing Tip Tank (if installed) Sump — DRAIN
- n. Tie Down and Chocks — REMOVE
- o. Navigation Light, Wing Tip Landing Light (if installed), 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. Flaps — CHECK GENERAL CONDITION

NOTE

Check operation of lights if night flight is anticipated.

BEFORE STARTING

1. Aft Door Visual Indicators — CHECK
2. Fwd Door Hook Engagement — CHECK
3. Instrument Air Switch (located fwd side of front spar cover) — NORMAL POSITION
4. Seats — POSITION AND LOCK. SEAT BACKS UPRIGHT
5. Seat Belts and Shoulder Harnesses — FASTEN
6. Oxygen — CHECK OPERATION
7. Landing Gear Handle — DOWN
8. Cowl Flap Switches — CHECK, OPEN
9. Fuel Selectors — CHECK ON
10. All Circuit Breakers, Switches and Equipment Controls — CHECK
11. Battery Switch - ON
12. Alternator Switches - ON

13. Fuel Quantity Indicators — CHECK QUANTITY (See LIMITATIONS for take-off fuel)
14. Landing Gear Position Lights — CHECK

STARTING

NOTE

When using external power, refer to COLD WEATHER OPERATION procedures in this section.

1. Propeller Control — HIGH RPM
2. Mixture Control — IDLE CUT-OFF
3. Battery Switch — ON
4. Boost Pump — ON
5. Start Engine:

COLD STARTS

- a. Throttle — ½ OPEN
- b. Mixture control FULL RICH for 2 to 3 seconds to prime then to IDLE CUT-OFF
- c. Throttle — ½ INCH OPEN
- d. Magneto/Start Switch — START
- e. When engine starts, return the Magneto/Start switch to BOTH. Slowly advance the mixture control to FULL RICH.

FLOODED ENGINE

- a. Mixture Control — IDLE CUT-OFF
- b. Throttle — ½ OPEN
- c. Magneto/Start Switch — START
- d. When engine starts, return the Magneto/Start switch to BOTH. Retard the throttle and slowly advance the mixture control to FULL RICH position.

HOT STARTS

- a. Throttle — APPROXIMATELY 1 INCH OPEN
 - b. Mixture Control — FULL FORWARD for 1 to 2 seconds then to IDLE CUT-OFF
 - c. Magneto/Start Switch — START
 - d. When engine starts, return the Magneto/Start switch to BOTH. Slowly advance the mixture control to FULL RICH.
6. Throttle 1000 to 1500 rpm
 7. Oil Pressure — ABOVE RED RADIAL WITHIN 30 SECONDS
 8. External Power (if used) — DISCONNECT
 9. Alternator Switch — ON
 10. Loadmeters — CHECK FOR BATTERY CHARGE
 11. Use the same procedure to start other engine.
 12. Fuel Boost Pumps — OFF

NOTE

Continuous use of the fuel boost pumps is recommended for ground operation in ambient temperatures of 32°C (90°F) or above.

AFTER STARTING AND TAXI

CAUTION

Never taxi with a flat shock strut.

1. Brakes — CHECK
2. Voltage and Loadmeters — CHECK
3. Avionics — ON AS REQUIRED
4. Lights — AS REQUIRED
5. Cabin Temperature — AS REQUIRED
6. Annunciator Warning Lights — PRESS-TO-TEST
7. Instruments — CHECK

BEFORE TAKEOFF

NOTE

All reclining seats must be in the upright position before takeoff.

1. Seat Belts and Shoulder Harnesses — CHECK
2. Parking Brake — SET
3. Engine Warm-up — 1000 TO 1500 RPM
4. Fuel Selectors — CROSSFEED (for 10-15 seconds)
5. Fuel Selectors — RETURN BOTH TO ON POSITION
6. Controls - CHECK PROPER DIRECTION AND FREEDOM OF MOVEMENT
7. Instruments - CHECK, NORMAL INDICATION AND SET
8. Flaps - CHECK OPERATION
9. Autopilot - CHECK
10. Electric Trim - CHECK OPERATION
11. Trim - SET TO TAKE-OFF RANGE
12. Throttles - 2000 RPM (75°F Oil Temperature - MINIMUM)
13. Magnetos - CHECK 150 rpm maximum drop within 50 rpm of each other.

NOTE

Avoid operation of one magneto for more than 5 to 10 seconds.

14. Pressurization — CHECK AND SET
15. Throttles — 1500 RPM
16. Propellers — FEATHER CHECK (No more than 500 rpm drop) Repeat 2 to 3 times in cold weather
17. Fuel Boost Pumps — ON
18. Gyro Pressure and Load Meters — CHECK
19. Throttles — IDLE
20. Ice Protection — AS REQUIRED
21. Parking Brake — RELEASE

TAKE-OFF

Take-Off Power 38.0 in. Hg and 2700 RPM
Minimum Take-Off Oil Temperature 100°F

NOTE

Take-off with oil temperature below 180°F may result in 1.0 to 2.0 in. Hg increase in manifold pressure above the 38.0 in. Hg allowable. This condition is not considered detrimental to the engine when encountered for only short periods of time (under 3 minutes).

1. Power — SET (take-off power before brake release)

FULL RICH FUEL FLOWS (SL to 10,000 FEET)

| | | |
|--------------------------|---------------------|--------------------------|
| ISA-30°C 33-39 gal/hr | ISA 30-36 gal/hr | ISA+30°C 27-33 gal/hr |
|--------------------------|---------------------|--------------------------|

2. Airspeed — ACCELERATE TO AND MAINTAIN TAKE-OFF SPEED
3. Landing Gear — RETRACT (when airplane is positively airborne)
4. Airspeed — ESTABLISH DESIRED CLIMB SPEED (when clear of obstacles)

MAXIMUM PERFORMANCE CLIMB

1. Power — SET MAXIMUM CONTINUOUS POWER
2. Fuel Boost Pumps — ON
3. Mixtures — FULL RICH
4. Cowl Flaps — OPEN
5. Airspeed — ESTABLISH 115 KTS

CRUISE CLIMB

1. Power — SET CRUISE CLIMB POWER (34.0 in. Hg — 2400 rpm)
2. Mixture — FULL RICH
3. Airspeed — 130 KTS
4. Cowl Flaps — AS REQUIRED (MAINTAIN 460°F CYLINDER HEAD TEMPERATURE OR LESS)
5. Boost Pumps — AS REQUIRED

NOTE

Use of fuel boost pumps may be discontinued at any time except that excessive fluctuations of fuel flow readings indicate a need for continued use.

CRUISE

Maximum Cruise Power33.0 in. Hg at 2400 rpm
Recommended Cruise Power30.0 in. Hg at 2400 rpm
Recommended Cruise Power30.0 in. Hg at 2200 rpm
Recommended Cruise Power26.0 in. Hg at 2200 rpm
Economy Cruise Power.....24.0 in. Hg at 2200 rpm

1. Power — SET AS DESIRED
2. Fuel Flow — LEAN (peak TIT or 1650°F)
3. Fuel Boost Pumps — OFF (unless needed)
4. Cowl Flaps — AS REQUIRED (maintain 420°F cylinder head temperature or less)
5. Cabin Alt Light — MONITOR

CAUTION

If cabin altitude light is illuminated, turn on oxygen and don mask.

**LEANING MIXTURE USING THE TURBINE INLET
TEMPERATURE INDICATOR (TIT)**

1. Set power not to exceed 33.0 in. Hg and 2400 rpm.
2. Lean the mixture to peak TIT or 1650°F, whichever occurs first.

CAUTION

Do not continue to lean mixture beyond peak temperature.

3. Set mixture to full rich for changes in altitude and power settings which will require the peak TIT to be rechecked and the mixture to be reset.

DESCENT

1. Altimeter — SET
2. Cowl Flaps — CLOSED
3. Windshield Defroster and Windshield Heat — AS REQUIRED (On before descent into warm, moist air)
4. Pressurization — SET
5. Power — AS REQUIRED (to maintain cabin pressurization)

BEFORE LANDING

NOTE

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

1. Pressurization — ZERO DIFFERENTIAL PRESSURE
2. Seat Belts and Shoulder Harnesses — CHECK
3. Fuel Boost Pumps — ON
4. Mixtures — FULL RICH
5. Flaps — APPROACH (15°) (Observe Maximum Extension Speed)
6. Landing Gear — DOWN (Observe Maximum Operation Speed)
7. Flaps — FULL DOWN (30°) (Observe Maximum Extension Speed)
8. Airspeed — ESTABLISH LANDING APPROACH SPEED
9. Propeller Levers — HIGH RPM

BALKED LANDING

1. Propellers — HIGH RPM
2. Throttles — FULL OPEN
3. Airspeed — BALKED LANDING CLIMB SPEED (92 kts)
4. Flaps — UP (0°)
5. Landing Gear — UP

AFTER LANDING

1. Landing and Taxi Lights — AS REQUIRED
2. Flaps — UP (0°)
3. Trim Tabs — SET TO ZERO
4. Cowl Flaps — OPEN
5. Fuel Boost Pumps — AS REQUIRED

NOTE

Fuel boost pumps may be turned off if ambient temperature is below 90°F (32°C).

6. Ice Protection — OFF
7. Door Seal Switch — DEFL

SHUTDOWN

CAUTION

Run engines at idle for 4 minutes before shutdown. Taxi time may be considered part of the 4 minutes.

1. Parking Brake — SET
2. Heater and Air Conditioner — OFF
3. Electrical and Avionics Equipment — OFF
4. Propellers — HIGH RPM
5. Throttles — 1000 RPM
6. Fuel Boost Pumps — OFF
7. Mixtures — IDLE CUT-OFF
8. Magneto/Start Switches — OFF, after engines stop
9. Battery and Alternator Switches — OFF
10. Controls — LOCKED
11. Wheel Chocks — INSTALL; Parking Brake — RELEASE

ENVIRONMENTAL CONTROLS

PRESSURIZATION SYSTEM

If, for any reason, both Cabin Pressurized Air Shutoff controls are closed, the Cabin Pressure switch must be in the DUMP position to provide adequate ventilation. In addition to the above, deflate the door seal for maximum ventilation.

BEFORE TAKEOFF

1. Cabin Pressurized Air Shutoff Controls — OPEN (In)
2. Door Seal Switch — INFL (Up)

3. Cabin Pressure Switch — PRESS (Up)
4. Controller — SET OUTER SCALE 1000 FEET BELOW FIELD ELEVATION
5. Throttles — 2000 RPM
6. Test Switch — PRESS-TO-TEST (Note momentary cabin descent) RELEASE SWITCH
7. Controller — SET OUTER SCALE TO DESIRED CABIN ALTITUDE OR INNER SCALE TO CRUISE ALTITUDE PLUS 500 FEET
8. Rate Control — SET (Arrow pointing up results in approximately 500 ft/min rate)

BEFORE DESCENT TO LANDING

1. Controller — SET OUTER SCALE 500 FEET ABOVE FIELD ELEVATION
2. Rate Control — SET TO ACHIEVE ZERO DIFFERENTIAL PRESSURE BEFORE LANDING

NOTE

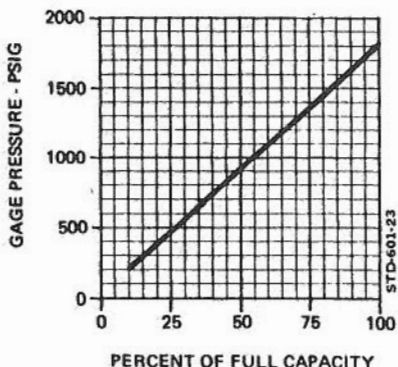
During descent, adjust power as required to maintain pressurization.

OXYGEN SYSTEM

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 bottle.

OXYGEN AVAILABLE WITH PARTIALLY FULL BOTTLE



EXAMPLE:

| | |
|-------------------------------|----------|
| People | 5 |
| Gage Pressure | 1500 psi |
| Percent Capacity (from chart) | 80% |
| Cylinder Capacity (full) | 15 cu ft |
| Oxygen Mask Flow Rate | 2.7 SLPM |
| Duration (full cylinder) | 29 min |
| Duration (80% full) | 23 min |
| Oxygen Mask Flow Rate | 3.7 SLPM |
| Duration (full cylinder) | 21 min |
| Duration (80% full) | 16 min |

DURATION — 2.7 SLPM Mask Flow Rate

Oxygen Duration is computed for Puritan Zep oxygen masks which regulate the flow rate to 2.7 Standard Liters Per Minute (SLPM). These masks, identified by an orange color coded plug-in, are approved for altitudes up to 22,000 feet.

15 CUBIC FOOT BOTTLE

| Persons Using | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------------|-----|----|----|----|----|----|
| Duration in Min | 149 | 74 | 49 | 37 | 29 | 24 |

Section IV
Normal Procedures

BEECHCRAFT
Baron 58P

DURATION — 3.7 SLPM Mask Flow Rate

Oxygen Duration is computed for Puritan Zep oxygen masks which regulate the flow rate to 3.7 Standard Liters Per Minute (SLPM). These masks, identified by a red color coded plug-in, are approved for altitudes up to 30,000 feet.

15 CUBIC FOOT BOTTLE

| Persons Using | 1 | 2 | 3 | 4 | 5 | 6 |
|-----------------|-----|----|----|----|----|----|
| Duration in Min | 109 | 54 | 36 | 27 | 21 | 18 |

WARNING

NO SMOKING when using oxygen.

IN FLIGHT

The use of oxygen is required at any time the cabin altitude light is illuminated.

1. Oxygen Control Valve — OPEN SLOWLY
2. Mask — INSERT FITTING, DON MASK (adjust mask for proper fit)
3. Oxygen — CHECK FOR FLOW

CAUTION

The following table sets forth the average time of useful consciousness (time from onset of hypoxia until loss of effective performance at various altitudes).

| | |
|-----------------------|-----------------|
| 25,000 ft MSL | 3 to 5 minutes |
| 22,000 ft MSL | 5 to 10 minutes |
| 12-18,000 ft MSL..... | 30 min or more |

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. However, it is desirable to shut off supply when not in use.

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

ELECTRIC ELEVATOR TRIM

1. On-Off Switch — ON
2. Control Wheel Trim Switch — Forward for nose down, aft for nose up (when released the switch returns to the center — OFF position)

Malfunction procedures are given in the EMERGENCY PROCEDURES section.

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, including a check of 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 Teledyne Continental Motors Corporation Specification MHS-24A. Always pull the propeller through by hand, opposite the direction of rotation, several times to clear the engine and "limber up" the cold, heavy oil before using the starter. This will also lessen the load on the battery if an auxiliary power unit is not used.

Under very cold conditions, it may be necessary to preheat the engines prior to a start. Particular attention should be given to the oil cooler and engine sump to ensure proper preheat. A start with congealed oil in the system may produce an indication of normal pressure immediately after the start, but then the oil pressure may decrease when residual oil in the engine is pumped back with the congealed oil in the sump. If an engine heater capable of heating both the engine sump and cooler is not available, the oil should be drained while the 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. 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).
2. 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.

Section IV

Normal Procedures

BEECHCRAFT

Baron 58P

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

STARTING ENGINES USING AUXILIARY POWER UNIT

1. Battery Switch — ON
2. 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)
7. Auxiliary Power Unit — OFF (after engine has been started)
8. Auxiliary Power Unit — DISCONNECT (before starting left engine)
9. 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.

ICING FLIGHT

This airplane is approved for flight in icing conditions as defined in FAR 25, Appendix C, when equipped in accordance with Beech Drawing 102-000018 or Beech Kit Drawing 102-5006. These conditions do not include, nor were tests conducted in, all icing conditions that may be encountered (e.g., freezing rain, freezing drizzle, mixed conditions, or conditions defined as severe). Some icing conditions not defined in FAR 25 have the potential of producing hazardous ice accumulations, which: 1) exceed the capabilities of the airplane's ice protection equipment; and/or 2) create unacceptable airplane performance. Flight into icing conditions which lie outside the FAR-defined conditions is not prohibited; however, pilots must be prepared to divert the flight promptly if hazardous ice accumulations occur.

Refer to Section II for limitations relating to icing flight and equipment that is required to be installed and operable, and Section III for emergency procedures associated with icing equipment malfunctions and procedures required for severe icing conditions.

WARNING

Due to distortion of the wing airfoil, ice accumulations on the leading edges can cause a significant loss in rate of climb and in speed performance, as well as increases in stall speed. Even after cycling the deicing boots, the ice accumulation remaining on the boots and unprotected areas of the airplane can cause large performance losses. For the same reason, the aural stall warning system may not be accurate and should not be relied upon. Maintain a comfortable margin of airspeed above the normal stall airspeed. In order to minimize ice accumulation on unprotected surfaces of the wing, maintain a minimum of 130 knots during operations in sustained icing conditions. If ice continues to accumulate on the airplane, exit icing conditions as soon as possible. Prior to a landing approach, cycle the deicing boots to shed any accumulated ice.

If icing is inadvertently encountered in an airplane not approved for flight in icing conditions, the flight should be altered as necessary to leave the icing conditions as soon as practicable.

THIS PAGE INTENTIONALLY LEFT BLANK

SURFACE DEICE SYSTEM

CAUTION

Operation of the surface deice system in ambient temperatures below — 40°C can cause permanent damage to the deice boots.

1. *BEFORE TAKEOFF*

- a. Right Throttle - 2000 RPM
- b. Surface Deice Switch - CYCLE (UP) and RELEASE
 - 1) CHECK VISUALLY FOR INFLATION AND 15 PSI MINIMUM DEICE PRESSURE
 - 2) CHECK VISUALLY FOR HOLD DOWN WHEN CYCLE IS COMPLETE
- c. Right Throttle - IDLE
- d. Left Throttle - 2000 RPM (Repeat Step b)
- e. Left Throttle - IDLE

NOTE

When surface deice system is not in operation, Deice Pressure Gage should read approximately 4.5 to 5.5 psi.

2. *IN FLIGHT*

When ice accumulates $\frac{1}{2}$ to 1 inch:

- a. Surface Deice Switch — CYCLE (UP)
- b. Deice Pressure Gage — 15 PSI MINIMUM (when boots are fully inflated) and 9 to 20 PSI (while boots are inflating).
- c. Repeat — AS REQUIRED

CAUTION

Rapid cycles in succession or cycling before at least $\frac{1}{2}$ 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 approximately 4 kts in all configurations with surface deice system operating.

NOTE

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

3. For Emergency Operation refer to the EMERGENCY PROCEDURES section.

ELECTROTHERMAL PROPELLER DEICE

CAUTION

Do not operate the propeller deice when the propellers are static.

1. BEFORE TAKEOFF

- a. Propeller Deice Switch — ON
- b. Propeller Deice Ammeter — CHECK (14 to 18 amps)

2. IN FLIGHT

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

CAUTION

If the propeller deice ammeter indicates an abnormal reading, refer to the EMERGENCY PROCEDURES section.

WINDSHIELD ANTI-ICE SYSTEM
(ELECTROTHERMAL)

1. BEFORE TAKEOFF

- a. WSHLD Heat Switch — ON (Note deflection on loadmeter)
- b. Windshield — CHECK (feel for warming)

CAUTION

Ground operation is limited to 10 minutes.

2. IN FLIGHT

NOTE

Continuous operation is permitted.

- a. WSHLD Heat Switch — AS REQUIRED (Heat should be applied before ice forms)

NOTE

If directional gyro is to be reset, turn off the electrothermal windshield heat for 15 seconds to allow a stable reading of the standby compass.

WINDSHIELD ANTI-ICE SYSTEM (FLUID FLOW)

CAUTION

This anti-ice system is designed to PREVENT the formation of ice. Always turn the system ON at the first indication of icing. This system is NOT approved for flight in icing conditions.

1. PREFLIGHT

- a. Check quantity in reservoir

2. IN FLIGHT

- a. Windshield Anti-ice Switch — ON AS REQUIRED
- b. Anti-ice Quantity Indicator — MONITOR

NOTE

System endurance with full reservoir is approximately 36 minutes with left windshield in operation.

PITOT HEAT AND HEATED STALL WARNING

- 1 Pitot Heat Switch(es) and Stall Warning Switch - ON
(Note deflection on Loadmeter)

NOTE

On airplanes not approved for flight in icing conditions, the heated stall warning (Safe Flight P/N 190-3) 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/Stall Warning systems.

HEATED FUEL VENTS

1 PREFLIGHT

- a. Fuel Vent Switch - ON (Note deflection on load-meter)

2 IN FLIGHT

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

WINDSHIELD DEFOGGING

- 1. Defrost Control — PUSH ON

WING ICE LIGHT

1 PREFLIGHT

- a. Ice Light - CHECK

2 IN FLIGHT

- a. Ice Light - ON AS REQUIRED

PRACTICE DEMONSTRATION OF V_{MCA}

VMCA 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 the recommended safe one engine inoperative speed of 86 knots are prohibited.

1. Landing Gear — UP
2. Flaps — UP
3. Airspeed — ABOVE RECOMMENDED SAFE ONE ENGINE INOPERATIVE SPEED (V_{SSE})
4. Propeller Levers — HIGH RPM
5. Throttle (Simulated inoperative engine) — IDLE
6. Throttle (Other engine) — FULL FORWARD
7. Airspeed — Reduce approximately 1 knot per second until either VMCA 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 VMCA 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} .

SECTION V

PERFORMANCE

TABLE OF CONTENTS

| <i>SUBJECT</i> | <i>PAGE</i> |
|---|-------------|
| Introduction to Performance and | |
| Flight Planning | 5-3 |
| Airspeed Calibration Normal System | 5-14 |
| Airspeed Calibration Normal | |
| System — Take-Off Ground Roll | 5-15 |
| Airspeed Calibration Alternate System..... | 5-16 |
| Altimeter Correction Normal System..... | 5-17 |
| Altimeter Correction Alternate System..... | 5-18 |
| Indicated Outside Air Temperature Correction..... | 5-19 |
| Fahrenheit to Celsius Temperature | |
| Conversion..... | 5-20 |
| ISA Conversion..... | 5-21 |
| Recommended Manifold Pressure | 5-22 |
| Take-Off Weight | 5-23 |
| Stall Speeds — Power Idle | 5-24 |
| Wind Components | 5-25 |
| Take-Off Distance..... | 5-26 |
| Take-Off Distance — Grass Surface..... | 5-27 |
| Accelerate — Stop | 5-28 |
| Accelerate — Go | 5-29 |
| Climb — Two-Engines | 5-30 |
| Take-Off Climb Gradient — One | |
| Engine Inoperative..... | 5-31 |
| Time, Fuel, and Distance to Climb | 5-32 |
| Climb — One-Engine Inoperative..... | 5-33 |
| Service Ceiling — One-Engine Inoperative..... | 5-34 |
| Climb — Balked Landing | 5-35 |

TABLE OF CONTENTS (Continued)

| <i>SUBJECT</i> | <i>PAGE</i> |
|--|-------------|
| Maximum Cruise Power — | |
| 33 in. Hg, 2400 RPM..... | 5-36 |
| Recommended Cruise Power — | |
| 30 in. Hg, 2400 RPM..... | 5-37 |
| Recommended Cruise Power — | |
| 30 in. Hg, 2200 RPM..... | 5-38 |
| Recommended Cruise Power — | |
| 26 in. Hg, 2200 RPM..... | 5-39 |
| Economy Cruise Power — | |
| 24 in. Hg, 2200 RPM..... | 5-40 |
| Range Profile — 190 Gallons | 5-41 |
| Range Profile — 166 Gallons | 5-42 |
| Range Profile — 100 Gallons | 5-43 |
| Endurance Profile — 190 Gallons | 5-44 |
| Endurance Profile — 166 Gallons | 5-45 |
| Endurance Profile — 100 Gallons | 5-46 |
| Holding Time | 5-47 |
| Descent..... | 5-48 |
| Landing Distance — Flaps 30° | 5-49 |
| Landing Distance — Flaps 0° | 5-50 |
| Landing Distance — Flaps 30° Grass Surface | 5-51 |
| Landing Distance — Flaps 0° Grass Surface | 5-52 |

**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. All 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 at a take-off weight of 5995 lbs (Baron 58PA) will be equal to or better than that of the higher weight Baron 58P.

CONDITIONS

At Billings:

| | |
|-------------------------------|------------------|
| Outside Air Temperature | 25°C (77°F) |
| Field Elevation | 3606 feet |
| Altimeter Setting | 29.56 in. Hg |
| Wind | 360° at 10 knots |
| Runway 34 Length | 5585 feet |

Route of Trip:

BIL-V19-CZI-V247-DGW-V19E-CYS-V19-DEN

Weather conditions IFR for cruise altitude of 17,000 feet

Section V
Performance

BEECHCRAFT
Baron 58P

| ROUTE SEGMENT | DIST NM | MEA FEET | WIND 17,000 FEET DIR/KTS | OAT 17,000 FEET °C | OAT AT MEA °C | ALT SET IN.HG |
|------------------|------------|-------------|-----------------------------------|-----------------------------|------------------------|---------------------|
| BIL-SHR | 88 | 8000 | 010/30 | -10 | 0 | 29.56 |
| SHR-CZI | 57 | 9000 | 350/40 | -10 | -4 | 29.60 |
| CZI-DGW | 95 | 8000 | 040/45 | -10 | 0 | 29.60 |
| CGW-CYS | 47 | 8000 | 040/45 | -10 | 0 | 29.60 |
| | 46 | 8000 | 040/45 | -10 | 0 | 29.60 |
| CYS-DEN | 81 | 8000 | 040/45 | -10 | 0 | 29.60 |

REFERENCE: Enroute Low Altitude Charts L-8 and L-9

At Denver:

Outside Air Temperature15°C (59°F)
Field Elevation5330 feet
Altimeter Setting29.60 in. Hg
Wind270° at 10 knots
Runway 26L Length10,010 feet

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 BIL:

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

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

$$3606 + 360 = 3966 \text{ feet}$$

Pressure Altitude at DEN:

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

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

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

For enroute altitudes and MEA's this pressure correction has been ignored.

Maximum Allowable Take-off Weight = 6100 lbs

$$\text{Ramp Weight} = 6100 + 32 = 6132 \text{ lbs}$$

NOTE

Fuel for start and taxi is normally 32 pounds.

Enter the Take-Off Weight graph at 3966 feet pressure altitude and 25°C.

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

$$\text{Take-off Weight} = 4975 \text{ pounds}$$

Enter the Take-Off Distance graph at 25°C, 3966 feet pressure altitude, 6100 pounds, and 9.5 knots headwind component.

| | |
|---|-----------|
| Ground Roll | 1970 feet |
| Total Distance over 50 ft Obstacle..... | 3020 feet |
| Lift-off Speed | 81 knots |
| 50 Foot Speed | 96 knots |

Enter the Accelerate-Stop graph at 25°C, 3966 feet pressure altitude, 6100 pounds, and 9.5 knots headwind component:

Accelerate-Stop Distance3670 feet
Engine Failure Speed81 knots

NOTE

Since 3670 feet is less than the available field length (5585 ft), the accelerate-stop procedure can be performed at any weight.

Takeoff at 6100 lbs can be accomplished. However, if an engine failure occurs prior to retraction of landing gear, the accelerate-stop procedure must be performed (even if airborne, unless sufficient altitude is available for retraction of landing gear while descending).

The following example assumes the airplane is loaded so that the take-off weight is 4975 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 25°C, 3966 feet pressure altitude, 4975 pounds, and 9.5 knots headwind component:

| | |
|--|-----------|
| Ground Roll | 1500 feet |
| Total Distance Over 50 ft Obstacle | 4550 feet |
| Lift-off Speed | 81 knots |
| 50 Foot Speed | 96 knots |

Enter the graph for Take-off Climb Gradient — One Engine Inoperative at 25°C, 3966 feet pressure altitude, and 4975 pounds.

| | |
|----------------------|----------|
| Climb Gradient | 2.9% |
| Climb Speed | 96 knots |

A 2.9% climb gradient is 29 feet of vertical height per 1000 feet of horizontal distance.

NOTE

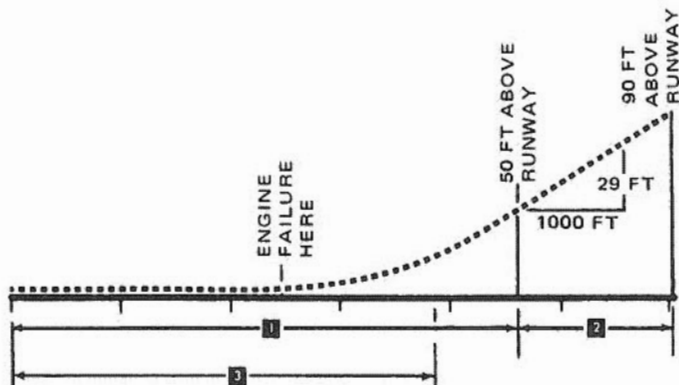
The Take-Off Climb Gradient — One Engine Inoperative graph assumes zero wind conditions. Climbing into a headwind will result in higher angles of climb, and hence, better obstacle clearance capabilities.

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 =
 $(90 - 50)(1000 \div 29) = 1379$ feet

Total Distance = $4550 + 1379 = 5929$ feet

The above results are illustrated below:



- 1 Accelerate - go take-off distance = 4550 feet
- 2 Distance to climb from 50 ft to 90 ft above runway = 1379 feet
- 3 Accelerate-stop distance for 6100 lbs take-off weight = 3670 feet

The following calculations provide information for the flight planning procedure. All examples are presented on the performance graphs. A take-off weight of 6100 pounds has been assumed.

Enter the Time, Fuel, and Distance to Climb graph at 25°C to 3966 feet and to 6100 pounds and enter at -10°C to 17,000 feet and to 6100 pounds, and read:

$$\text{Time to Climb} = 25 - 6 = 19 \text{ min}$$

$$\text{Fuel Used to Climb} = 132 - 34 = 98 \text{ pounds}$$

$$\text{Distance Traveled} = 63 - 13 = 50 \text{ NM}$$

Enter graph for ISA Conversion at the enroute conditions:

Pressure Altitude = 17,000 feet
OAT = -10°C
ISA Condition = ISA + 9°C

The cruise power setting is assumed to be Recommended
Cruise Power - 30 in. Hg, 2400 RPM.

Enter the table for Recommended Cruise Power — 30 in. Hg,
2400 RPM at ISA, and ISA + 36°F (ISA + 20°C)

Interpolate to obtain cruise speeds and fuel flow rates at
17,000 feet.

| CRUISE TRUE AIRSPEED ~ KTS | | CRUISE FUEL FLOWS ~ GAL/HR/ENG | |
|-------------------------------|------------|-----------------------------------|------------|
| ISA | ISA + 20°C | ISA | ISA + 20°C |
| 218 | 210 | 17.5 | 14.8 |

Interpolate between these speeds for ISA + 9°C

Cruise True Airspeed = 214 knots

Interpolate between these fuel flows for ISA + 9°C

Fuel Flow Per Engine = 16.3 gal/hr
Total Fuel Flow = 32.6 gal/hr
 (196 lb/hr)

Enter the graph for Descent at 17,000 feet to the descent line
and enter again at 5650 feet to the descent line, and read:

Time to Descend = 16.5 - 6.5 = 10 min
Fuel Used to Descend = 44 - 16 = 28 pounds
Descent Distance = 59 - 21 = 38 NM

Section V
Performance

BEECHCRAFT
Baron 58P

Time and fuel used were calculated at Recommended Cruise Power — 30 in. Hg, 2400 RPM as follows:

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

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

Results are as follows:

| ROUTE | MAG COURSE | MAG VAR | EST GROUND SPEED KTS | DIST NM | TIME AT CRUISE ALT HRS:MIN | FUEL USED FOR CRUISE LBS |
|---------|---------------|------------|-------------------------------|------------|-------------------------------------|--------------------------------|
| BIL-SHR | 114° | 16°E | 227 | *38 | :10 | 33 |
| SHR-CZI | 136° | 15°E | 252 | 57 | :14 | 44 |
| CZI-DGW | 131° | 15°E | 222 | 95 | :26 | 84 |
| DGW-CYS | 138° | 14°E | 227 | 47 | :12 | 41 |
| | 169° | 14°E | 249 | 46 | :11 | 36 |
| CYS-DEN | 166° | 14°E | 247 | *43 | :10 | 34 |

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

Fuel used from BIL to SHR is:

$$98 + 33 = 131 \text{ pounds}$$

The estimated weight upon reaching SHR is:

$$6100 - 131 = 5969 \text{ pounds}$$

NOTE

The two engine rate of climb was determined for the cruise altitude and estimated weight at SHR. The MEA at SHR was the highest MEA encountered during the flight. Climb — One Engine Inoperative and Service Ceiling were determined for the MEA and weight at SHR.

| DETERMINATION OF FLIGHT TIME, BLOCK SPEED AND FUEL REQUIREMENTS | | | |
|--|-------------------------|---------------------|-------------------|
| ITEM | TIME HRS:MIN | FUEL LBS | DIS NM |
| Start, Runup, Taxi and Take-off Acceleration | : 00 | 32 | 0 |
| Climb | : 19 | 98 | 50 |
| Cruise | 1 : 23 | 272 | 326 |
| Descent | : 10 | 28 | 38 |
| Total | 1 : 52 | 430 | 414 |

Total Flight Time: 1 hour, 52 minutes

Block Speed: $414 \text{ NM} \div 1 \text{ hour, 52 minutes} = 222 \text{ knots}$

Reserve Fuel (45 minutes at Economy Cruise Power):

Obtain fuel flow rate from Economy Cruise Power table at 17,000 feet for ISA (assume ISA fuel flow rate).

| | | |
|----------------------|---|-------------------------------|
| Fuel Flow Per Engine | = | 11.3 gal/hr |
| Total Fuel Flow | = | 22.6 gal/hr (135.6 lbs/hr) |

Section V
Performance

BEECHCRAFT
Baron 58P

Reserve Fuel = (45 min)(135.6 lbs/hr) = 102 lbs (17 gal)

■ Total Fuel: 430 + 102 = 532 lbs (87 gal aviation gasoline)

Check for Maximum Zero Fuel Weight requirement:

■ Ramp Weight — Fuel Requirement = 6132 — 532 = 5600 lbs

■ The maximum zero fuel weight requirement of 5700 lbs has not been exceeded.

If the requirement had not been met, two options would have existed:

1. Reduce the Zero Fuel Weight to 5700 pounds, then add the fuel required for the flight.
2. Increase the fuel load to at least 72 gal (6132 — 5700 = 432 lbs).

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

■ $6132 - 430 = 5702 \text{ lbs}$

■ Enter the graph for Landing Distance — Flaps 30 Degrees at 15°C, 5650 feet pressure altitude, 5702 pounds, and 9.5 knots headwind component.

| | |
|---------------------------------|-----------|
| Ground Roll | 1610 feet |
| Total Over 50 ft Obstacle | 2690 feet |
| Approach Speed | 99 knots |

■ Enter the graph for Climb — Balked Landing at 15°C, 5650 feet pressure altitude, and 5702 pounds.

| | |
|----------------------|------------|
| Rate of Climb | 900 ft/min |
| Climb Gradient | 7.2% |

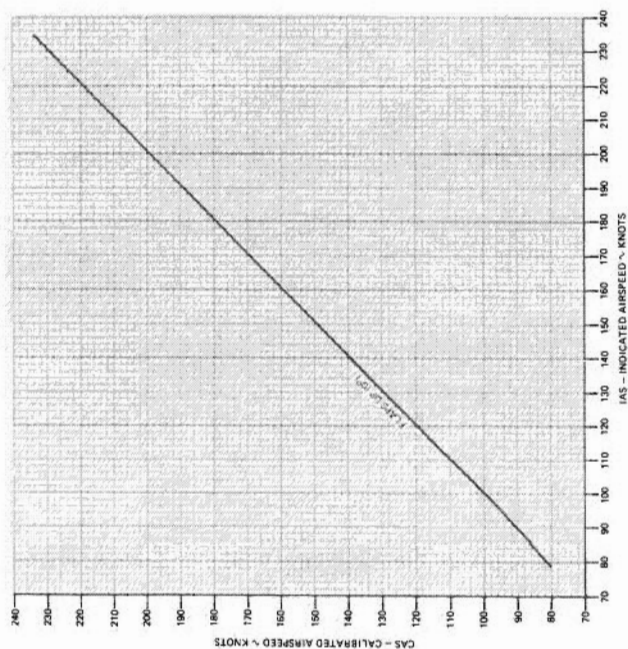
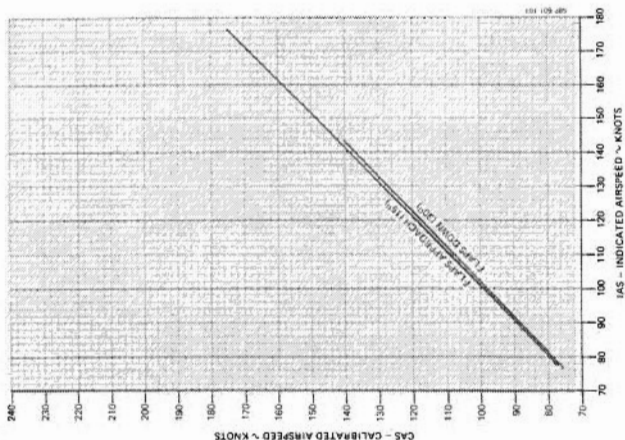
COMMENTS PERTINENT TO THE USE OF PERFORMANCE GRAPHS:

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 in flight, by using the Airspeed Calibration Normal System, and the Airspeed Calibration Normal System Take-off Ground Roll, for all lift off speeds.
4. The associated conditions define the specific conditions from which performance parameters have been determined. They are not intended to be used as instructions.
5. The full amount of usable fuel is available for all approved flight conditions.

Section V Performance

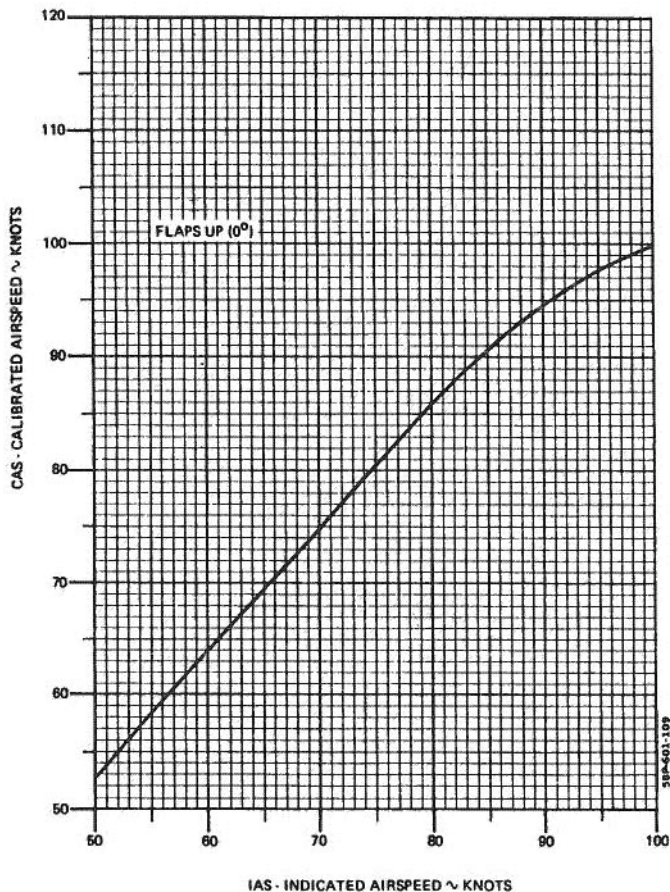
BEECHCRAFT Baron 58P

AIRSPEED CALIBRATION NORMAL SYSTEM



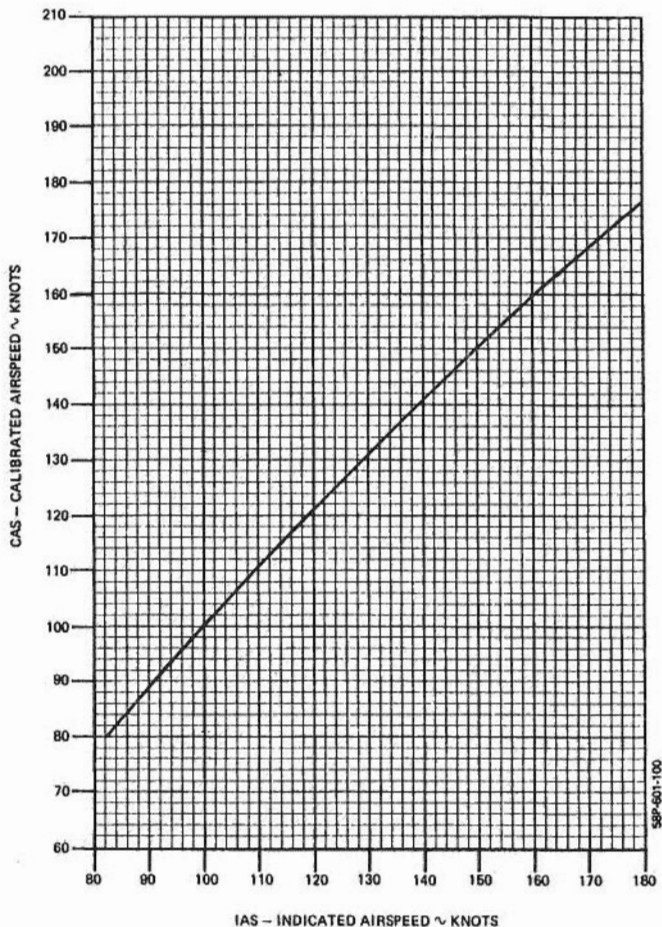
AIRSPEED CALIBRATION NORMAL SYSTEM

TAKE-OFF GROUND ROLL

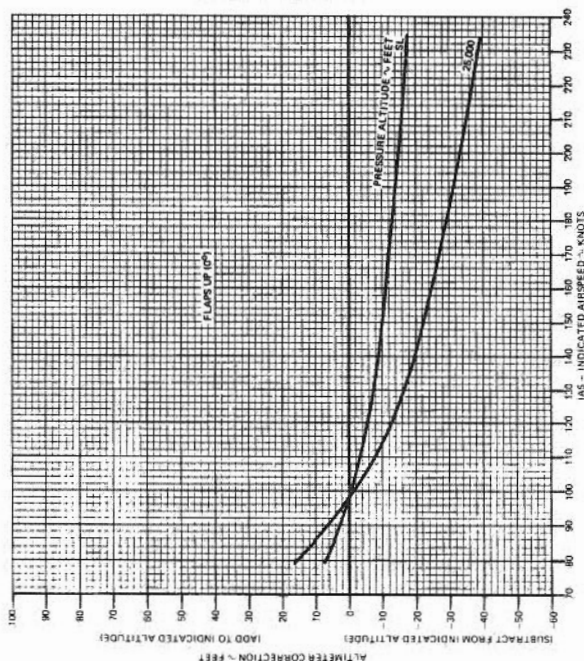
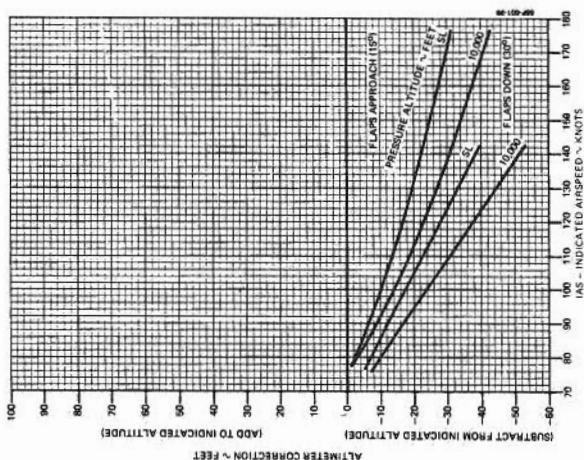


AIRSPEED CALIBRATION ALTERNATE SYSTEM

APPLICABLE FOR ALL FLAP POSITIONS

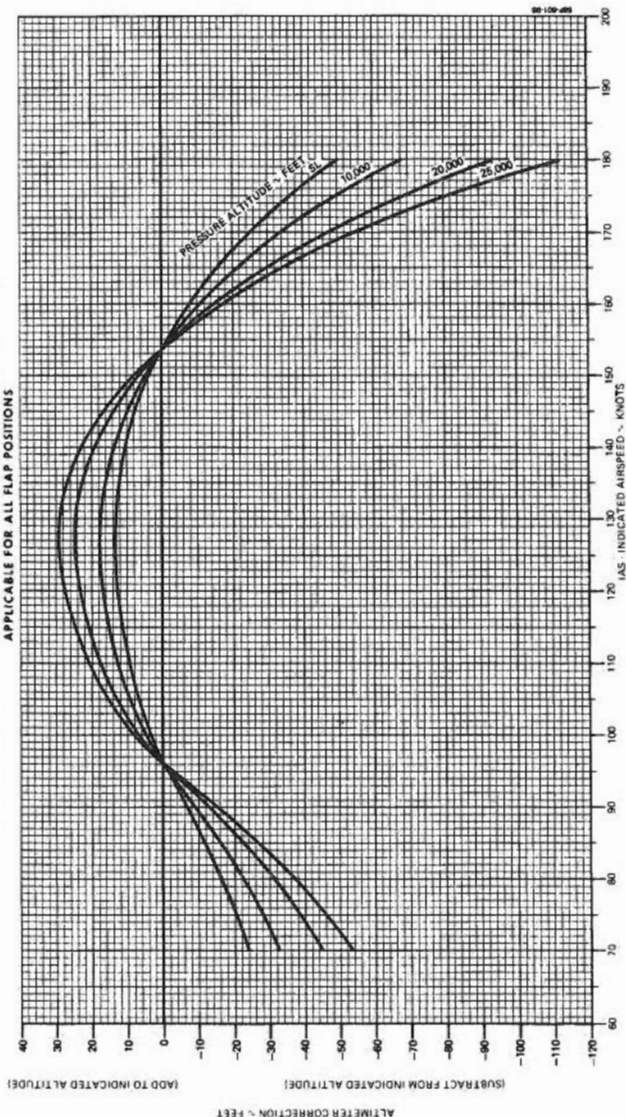


ALTIMETER CORRECTION NORMAL SYSTEM



ALTIMETER CORRECTION ALTERNATE SYSTEM

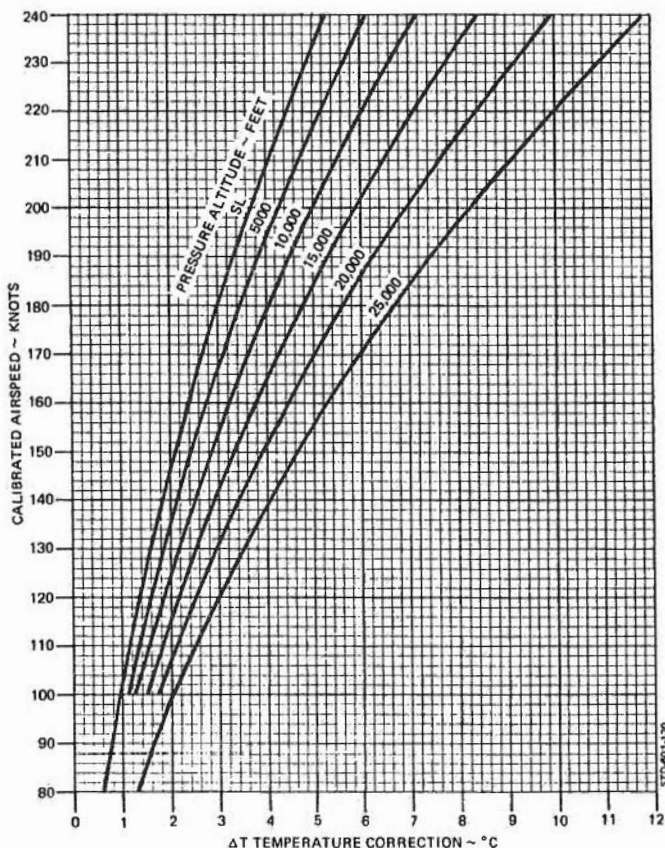
APPLICABLE FOR ALL FLAP POSITIONS



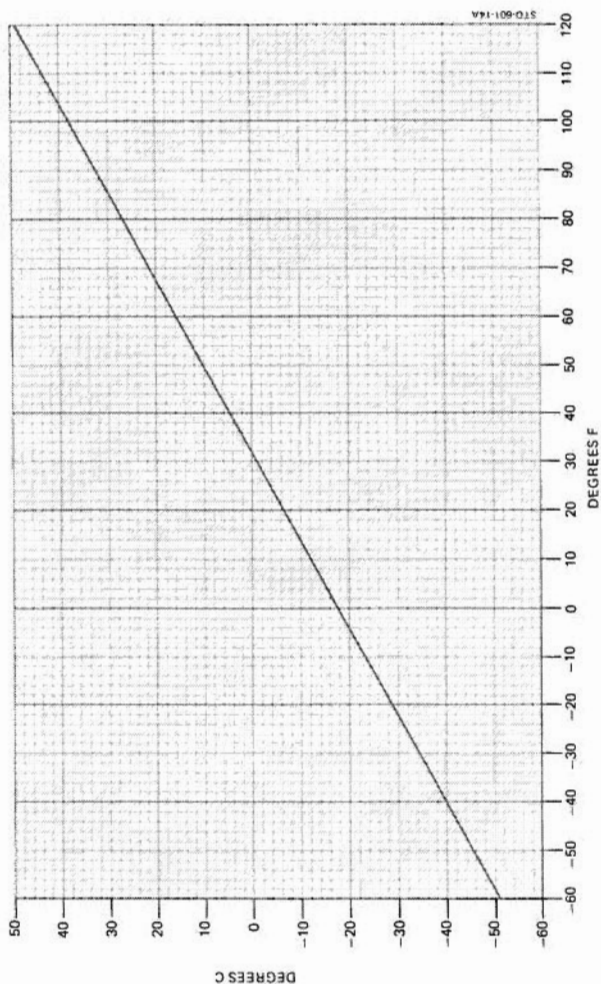
**INDICATED OUTSIDE AIR TEMPERATURE
CORRECTION**

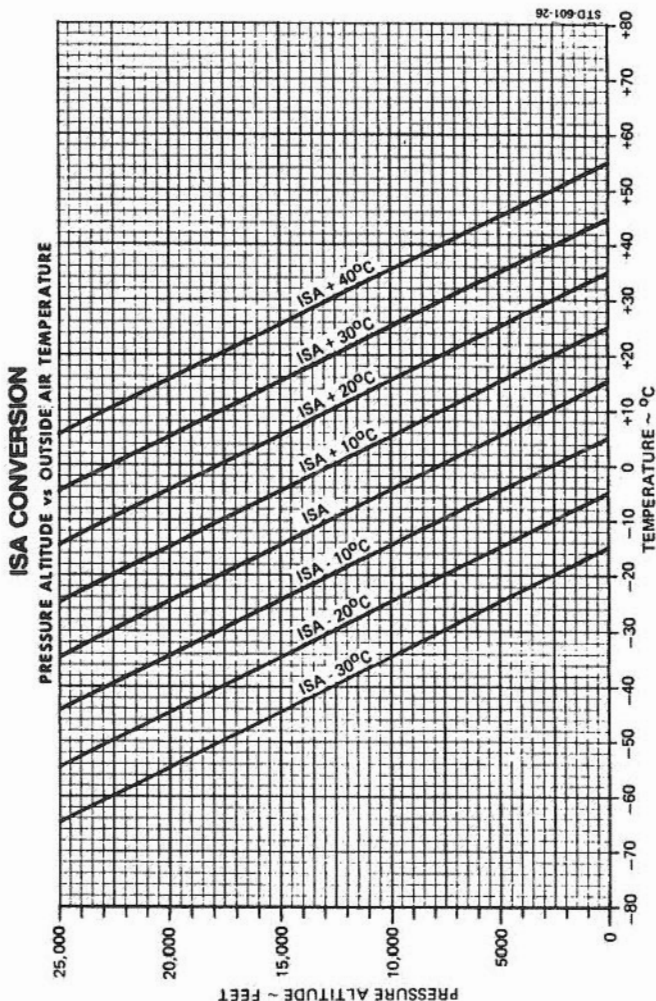
STANDARD DAY (ISA)

NOTE: SUBTRACT ΔT FROM INDICATED (GAGE) OAT TO OBTAIN TRUE OAT (ΔT ASSUMES A RECOVERY FACTOR OF 0.7)

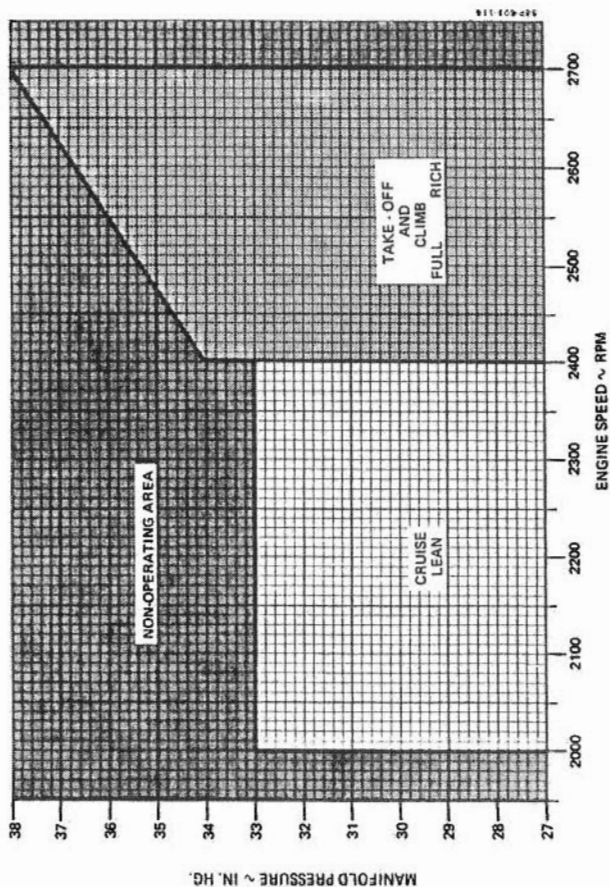


FAHRENHEIT TO CELSIUS TEMPERATURE CONVERSION





RECOMMENDED MANIFOLD PRESSURE



TAKE-OFF WEIGHT

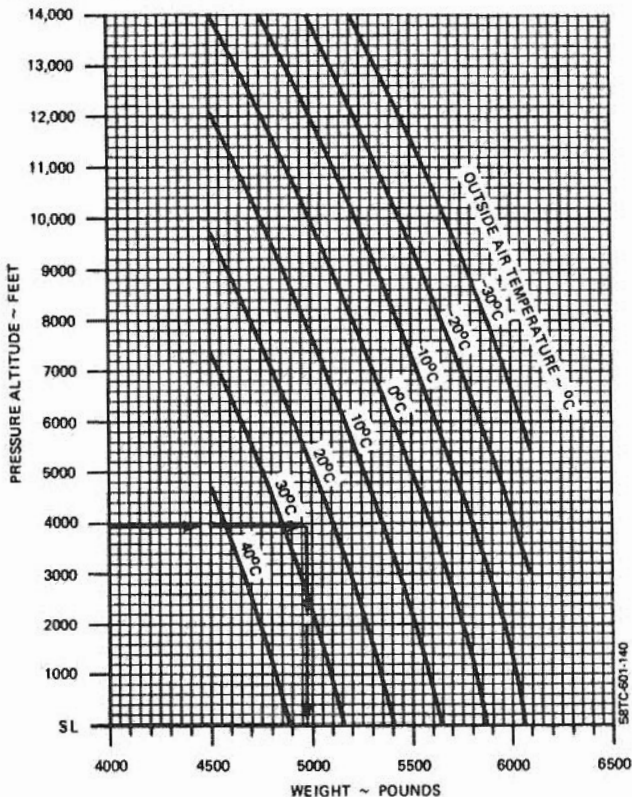
TO ACHIEVE POSITIVE SINGLE ENGINE RATE OF CLIMB AT LIFT-OFF

ASSOCIATED CONDITIONS:

AIRPLANE AIRBORNE
POWER TAKE OFF AT
2700 RPM
FLAPS UP (0°)
LANDING GEAR DOWN
INOPERATIVE
PROPELLER FEATHERED

EXAMPLE:

PRESSURE ALTITUDE . . . 3966 FT
OAT 25°C
TAKE-OFF WEIGHT 4975 LBS

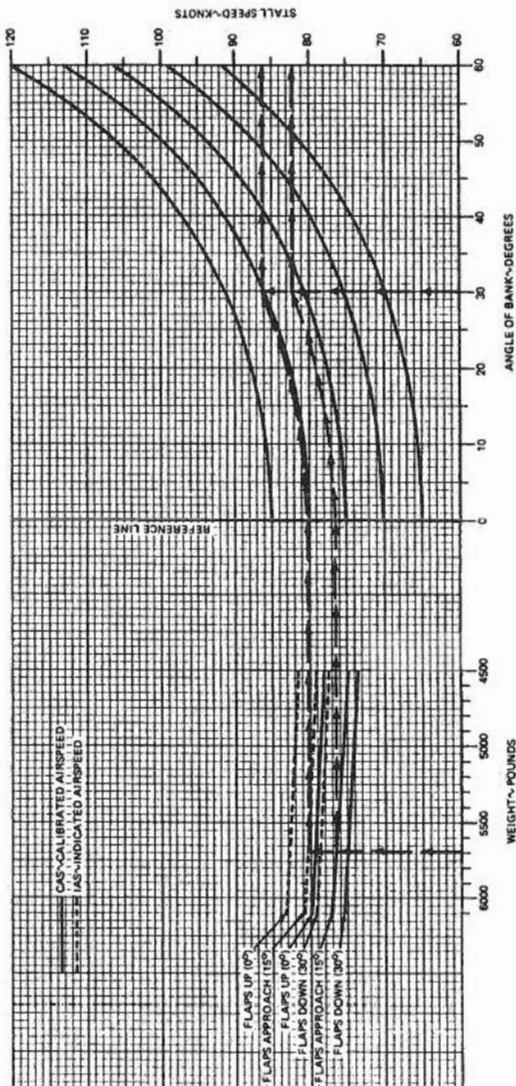


STALL SPEEDS - POWER IDLE

NOTES:

1. THE MAXIMUM ALTITUDE LOSS EXPERIENCED WHILE CONDUCTING STALLS IN ACCORDANCE WITH FAR 23.201 WAS 350 FEET.
2. MAXIMUM NOSE DOWN PITCH ATTITUDE AND ALTITUDE LOSS DURING RECOVERY FROM ONE ENGINE INOPERATIVE STALLS PER FAR 23.205 ARE APPROXIMATELY 30° AND 100 FEET RESPECTIVELY.
3. A NORMAL STALL RECOVERY TECHNIQUE MAY BE USED

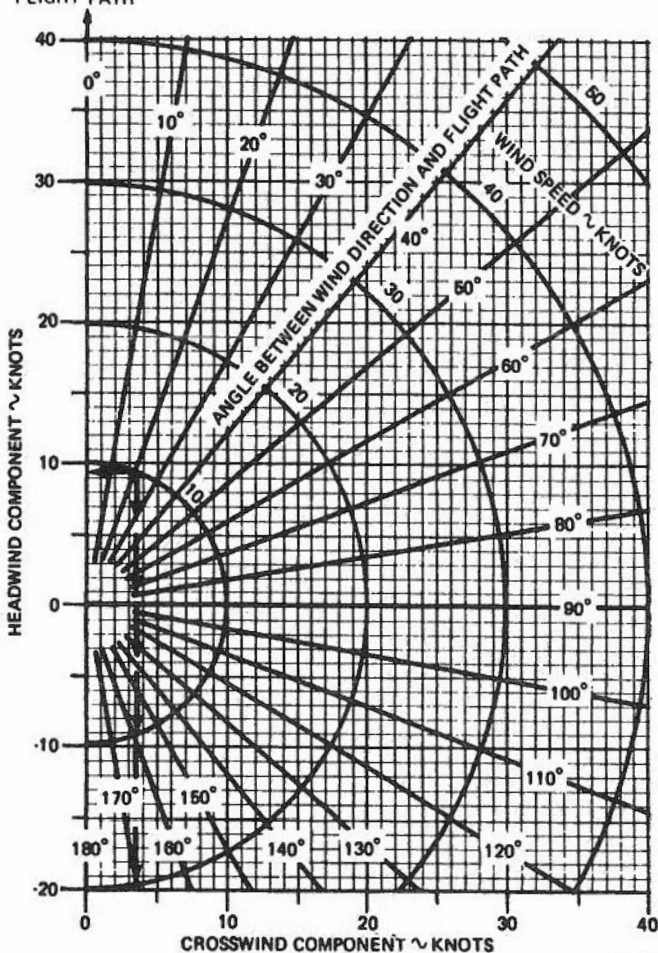
EXAMPLE:
WEIGHT 5686 LBS
FLAPS 15°
ANGLE OF BANK 30°
STALL SPEED 82 KTS CAS
86 KTS IAS



WIND COMPONENTS
Demonstrated Crosswind is 30 kts

EXAMPLE:

| | |
|--|-----------|
| WIND SPEED | 10 KNOTS |
| ANGLE BETWEEN WIND DIRECTION AND FLIGHT PATH | 20° |
| HEADWIND COMPONENT | 9.5 KNOTS |
| CROSSWIND COMPONENT | 3.5 KNOTS |
| FLIGHT PATH | |



Section V Performance

BEECHCRAFT
Baron 58P

TAKE-OFF DISTANCE

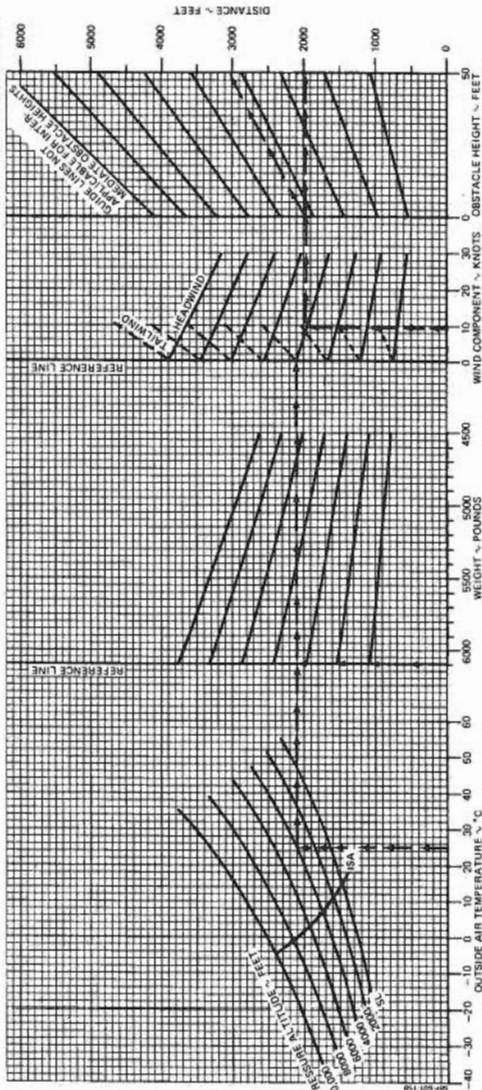
ASSOCIATED CONDITIONS:

POWER TAKE OFF AT 2700 RPM SET
FLAPS UP (10°)
LANDING GEAR RETRACT AFTER LIFT OFF
SLIPSTREAM LEVEL, DRY SURFACE
COWL FLAPS OPEN

| WEIGHT ~ LBS | TAKE OFF SPEED ~ KTS | |
|--------------|----------------------|-------|
| | LIFT OFF | 50 FT |
| 6100 | 81 | 96 |
| 5500 | 81 | 95 |
| 5000 | 81 | 94 |
| 4500 | 81 | 94 |

EXAMPLE:

OAT 25°C
PRESSURE ALTITUDE 2000 FT
TAKE OFF WEIGHT 5500 LBS
HEADWIND COMPONENT 9.5 KTS
GROUND ROLL 1970 FT
TOTAL DISTANCE OVER
50 FT OBSTACLE 3020 FT
TAKE OFF SPEEDS: AT LIFT OFF 81 KTS
AT 50 FT 96 KTS



BEECHCRAFT Baron 58P

Section V Performance

TAKE-OFF DISTANCE - GRASS SURFACE

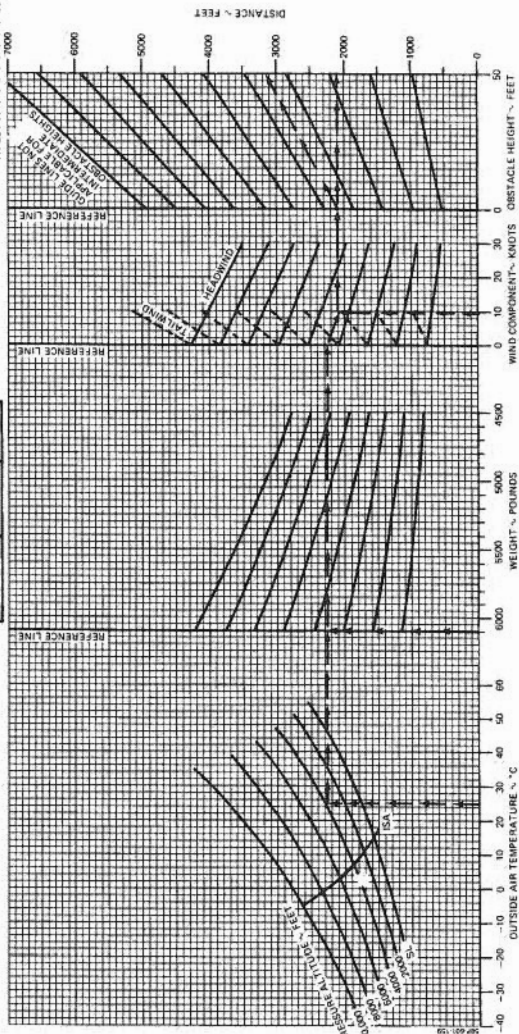
ASSOCIATED CONDITIONS:

POWER TAKE OFF AT 2700 RPM SET
BEFORE BRAKE RELEASE
FLAPS UP
LANDING GEAR RETRACT AFTER LIFT OFF
RUNWAY SHORT, DRY GRASS, LEVEL SURFACE
COWL FLAPS OPEN

| WEIGHT ~ LBS | TAKE OFF SPEED ~ KTS | |
|--------------|----------------------|-------|
| | LIFT OFF | 50 FT |
| 6100 | 81 | 85 |
| 5500 | 81 | 85 |
| 5000 | 81 | 84 |

EXAMPLE:

DAY 25°C
PRESSURE ALTITUDE 6100 FT
TAKE OFF WEIGHT 5500 LBS
HEADWIND COMPONENT 9.5 KTS
GROUND ROLL 2100 FT
LIFT OFF ALTITUDE 2150 FT
TAKE OFF SPEEDS: AT LIFT OFF 81 KTS
AT 50 FT 96 KTS



Section V Performance

**BEECHCRAFT
Baron 58P**

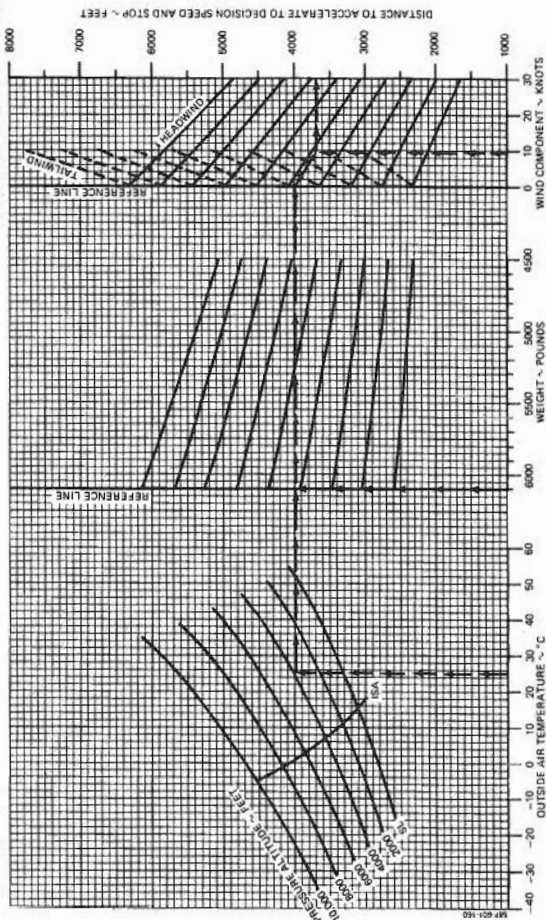
ACCELERATE - STOP DECISION SPEED - 81 KNOTS (ALL WEIGHTS)

ASSOCIATED CONDITIONS:

- POWER 1. TAKE OFF POWER AT 2700 RPM
- FLAPS 2. SET BEFORE BRAKE RELEASE
- RUNWAY 3. ENGINE IDLE AT DECISION SPEED
- COMFL FLAPS 4. PAVED, LEVEL, DRY SURFACE
- OPEN

EXAMPLE:

OAT 25°C
PRESSURE ALTITUDE 3866 FT
TAKE OFF WEIGHT 5100 LBS
HEADWIND COMPONENT 9.5 KTS
ACCELERATE AND STOP DISTANCE 3670 FT
DECISION SPEED 81 KTS

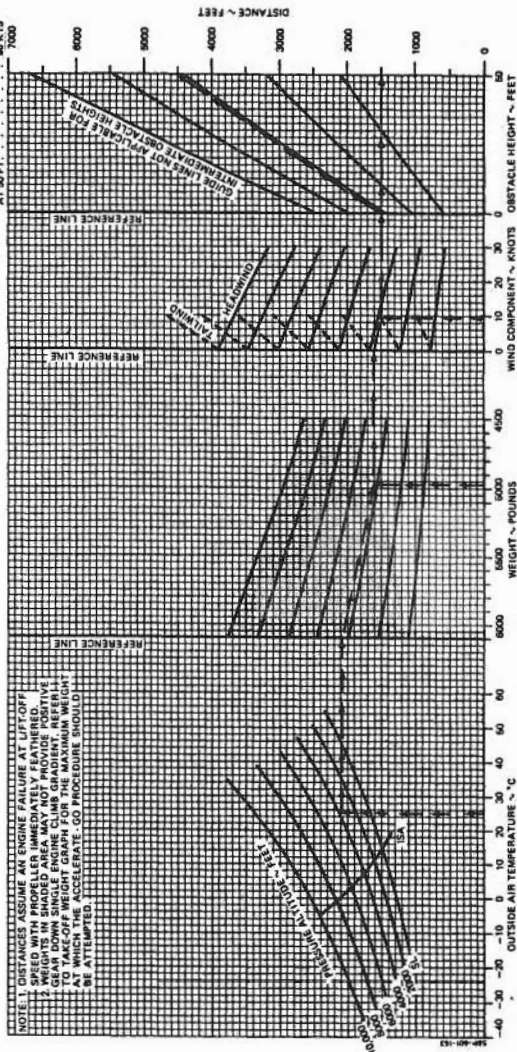


ACCELERATE - GO

| | |
|--------------|--|
| POWER | TAKE-OFF AT 2700 RPM SET BEFORE BRAKE RELEASE |
| FLAPS | UP (0°) |
| LANDING GEAR | RETRACT AFTER LIFT-OFF |
| RUNWAY | PAVED, LEVEL, DRY SURFACE |
| COWL FLAPS | OPEN |

[illegible]

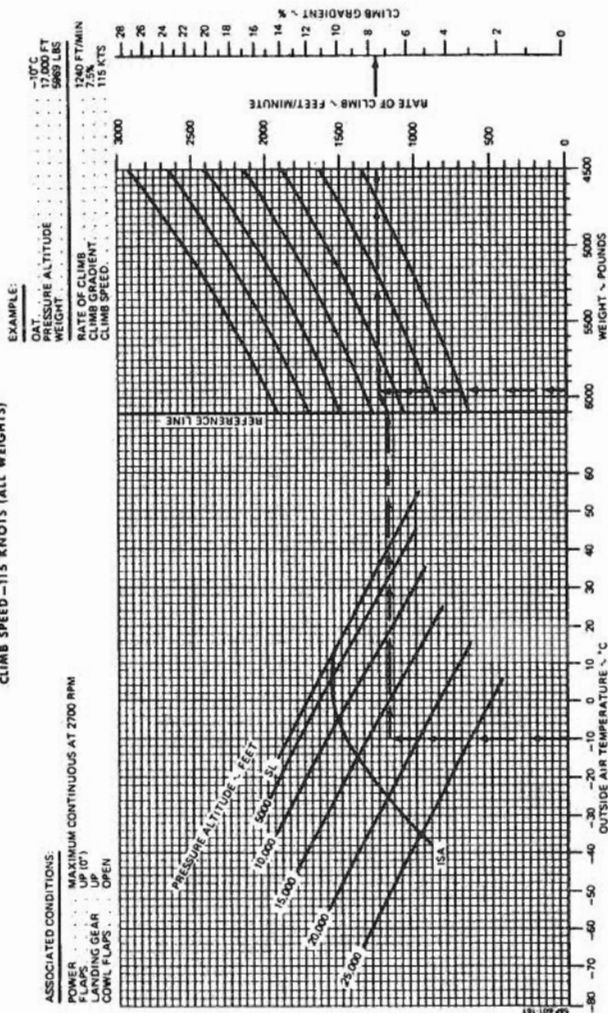
| | | |
|-----------------|----------|--------|
| TAKE-OFF SPEEDS | LIFT-OFF | 81 KTS |
| | 50 FT | 96 KTS |



Section V Performance

BEECHCRAFT
Baron 58⁰

CLIMB - TWO ENGINES CLIMB SPEED - 115 KNOTS (ALL WEIGHTS)



TAKE-OFF CLIMB GRADIENT - ONE ENGINE INOPERATIVE

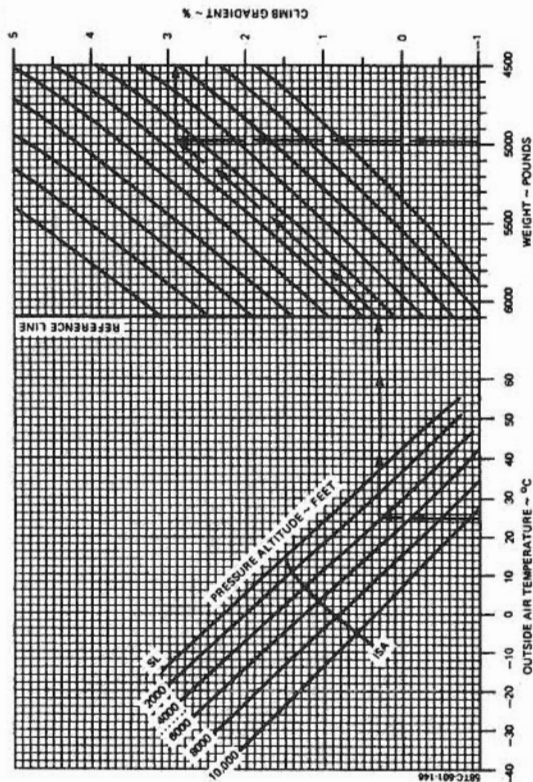
ASSOCIATED CONDITIONS:

POWER TAKE-OFF AT 2700 RPM
FLAPS UP (10°)
LANDING GEAR UP
COWL FLAPS OPEN
INOPERATIVE PROPELLER . . . FEATHERED

CLIMB SPEED - 96 KNOTS (ALL WEIGHTS)

EXAMPLE:

OAT 25°C
PRESSURE ALTITUDE 3665 FT
WEIGHT 4975 LBS
CLIMB GRADIENT 2.9%
CLIMB SPEED 96 KTS



Section V Performance

BEECHCRAFT Baron 58P

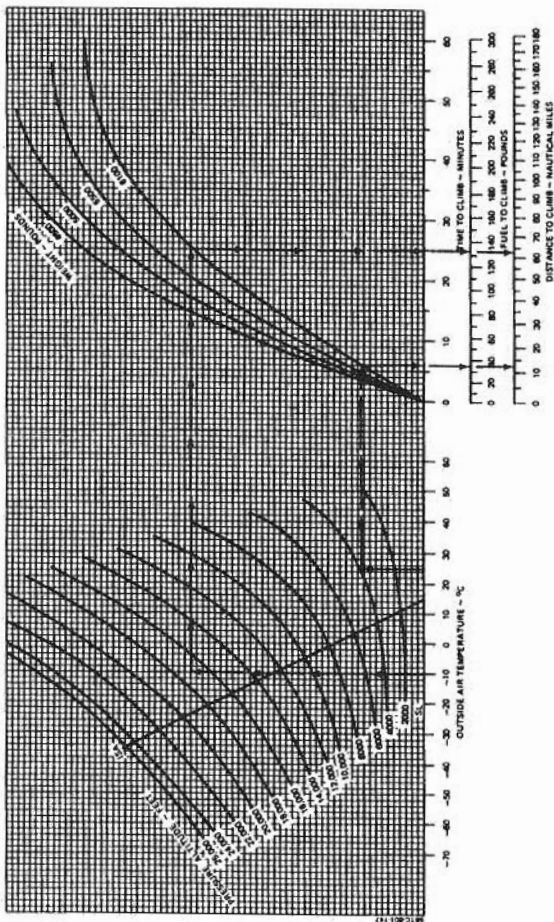
TIME, FUEL, AND DISTANCE TO CLIMB

CLIMB SPEED-130 KNOTS (ALL WEIGHTS)

ASSOCIATED CONDITIONS:
PROPELLER SPEED . . . 2400 RPM
MANIFOLD PRESSURE . . . 34 in. Hg
RPM . . . 2400
MIXTURE . . . FULL RICH
COWL FLAPS . . . OPEN

EXAMPLE

OAT AT TAKE-OFF . . . 25°C
OAT AT CRUISE . . . -10°C
CRUISE ALTITUDE . . . 7000 FT
CRUISE PRESSURE ALTITUDE . . . 8100 FT
INITIAL CLIMB WEIGHT . . .
TIME TO CLIMB . . . 25-40-18 MIN
FUEL TO CLIMB . . . 132.34-68 LBS
DISTANCE TO CLIMB . . . 63.13-50 NM



CLIMB - ONE ENGINE INOPERATIVE

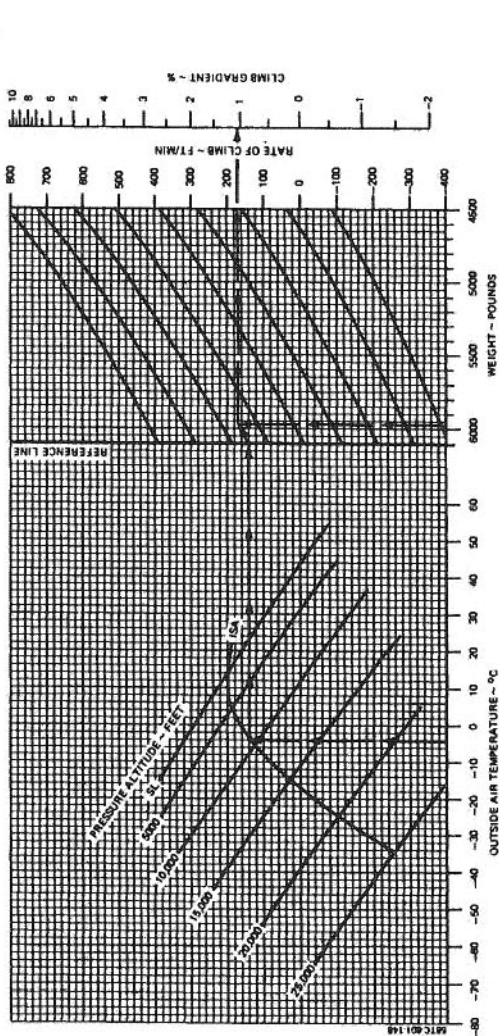
CLIMB SPEED-115 KNOTS (ALL WEIGHTS)

ASSOCIATED CONDITIONS:

POWER MAXIMUM CONTINUOUS AT
FLAPS 200 RPM
LANDING GEAR UP (UP)
INOPERATIVE PROPELLER FEATHERED
COWL FLAP OPEN

EXAMPLE:

OAT -4°C
PRESSURE ALTITUDE 9000 FT
WEIGHT 5889 LBS
RATE OF CLIMB 170 FT/MIN
CLIMB GRADIENT 1.10%
CLIMB SPEED 115 KTS



SERVICE CEILING - ONE ENGINE INOPERATIVE

CLIMB SPEED-115 KNOTS (ALL WEIGHTS)

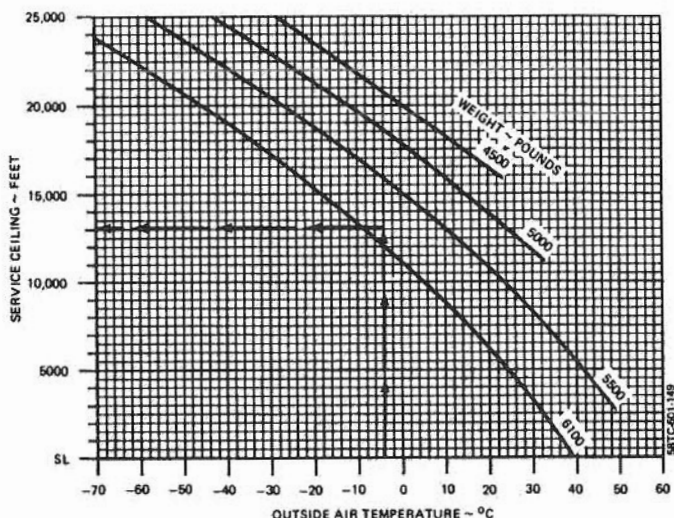
ASSOCIATED CONDITIONS:

POWER MAXIMUM
CONTINUOUS
AT 2700 RPM
FLAPS UP (0°)
LANDING GEAR UP
INOPERATIVE PROPELLER FEATHERED

EXAMPLE:

OAT AT MEA -4°C
WEIGHT 5969 LBS
ROUTE SEGMENT MEA 9000 FT
SERVICE CEILING 13,050 FT
SERVICE CEILING IS ABOVE MEA

NOTE:
SERVICE CEILING IS ALTITUDE WHERE AIRPLANE HAS CAPABILITY OF CLIMBING
50 FT/MIN WITH ONE PROPELLER FEATHERED



CLIMB - BALKED LANDING

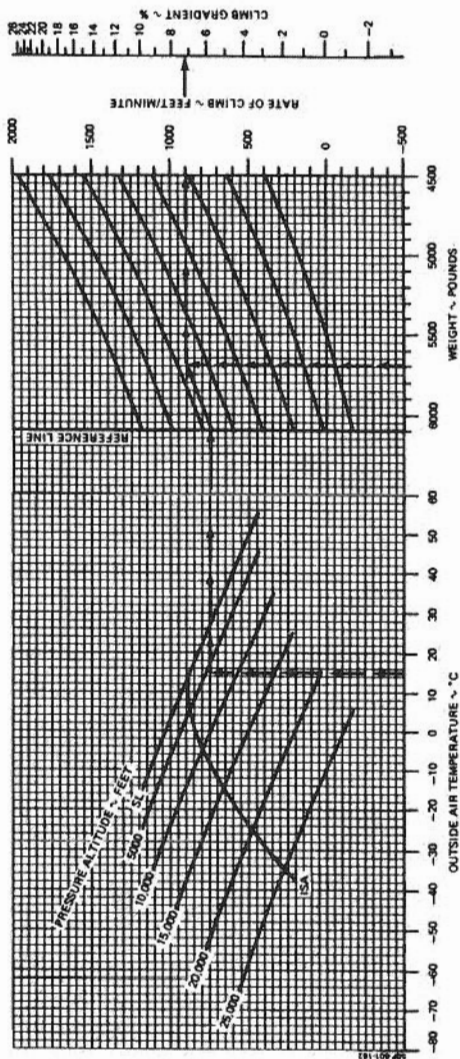
CLIMB SPEED - 92 KNOTS (ALL WEIGHTS)

ASSOCIATED CONDITIONS:

POWER TAKE-OFF AT 2700 RPM
FLAPS DOWN (30°)
LANDING GEAR DOWN

EXAMPLE:

QAT 15°C
PRESSURE ALTITUDE 5800 FT
WEIGHT 5700 LBS
RATE OF CLIMB 900 FT/MIN
CLIMB GRADIENT 7.2%
CLIMB SPEED 92 KNOTS



MAXIMUM CRUISE POWER 33 IN. HG, 2400 RPM

| | | | | | | | | | | | | |
|-----|------|-----|-----|-----|-----|-------|-----|-----|----|-----|------|-----|
| -49 | 21.2 | 175 | 247 | -20 | -29 | 18.54 | 164 | 241 | 14 | -10 | 15.8 | 151 |
| -45 | 21.3 | 177 | 245 | -17 | -27 | 18.7 | 165 | 239 | 18 | -8 | 15.9 | 152 |
| -43 | 21.5 | 179 | 243 | -15 | -25 | 18.9 | 166 | 237 | 20 | -6 | 16.0 | 153 |
| -41 | 21.6 | 180 | 241 | -13 | -23 | 19.0 | 167 | 235 | 22 | -4 | 16.1 | 154 |
| -39 | 21.7 | 181 | 239 | -11 | -21 | 19.1 | 168 | 233 | 24 | -2 | 16.2 | 155 |
| -37 | 21.8 | 182 | 237 | -9 | -19 | 19.2 | 169 | 231 | 26 | 0 | 16.3 | 156 |
| -35 | 21.9 | 183 | 235 | -7 | -17 | 19.3 | 170 | 229 | 28 | 2 | 16.4 | 157 |
| -33 | 22.0 | 184 | 233 | -5 | -15 | 19.4 | 171 | 227 | 30 | 4 | 16.5 | 158 |
| -31 | 22.1 | 185 | 231 | -3 | -13 | 19.5 | 172 | 225 | 32 | 6 | 16.6 | 159 |
| -29 | 22.2 | 186 | 229 | -1 | -11 | 19.6 | 173 | 223 | 34 | 8 | 16.7 | 160 |
| -27 | 22.3 | 187 | 227 | 1 | -9 | 19.7 | 174 | 221 | 36 | 10 | 16.8 | 161 |
| -25 | 22.4 | 188 | 225 | 3 | -7 | 19.8 | 175 | 219 | 38 | 12 | 16.9 | 162 |
| -23 | 22.5 | 189 | 223 | 5 | -5 | 19.9 | 176 | 217 | 40 | 14 | 17.0 | 163 |
| -21 | 22.6 | 190 | 221 | 7 | -3 | 20.0 | 177 | 215 | 42 | 16 | 17.1 | 164 |
| -19 | 22.7 | 191 | 219 | 9 | -1 | 20.1 | 178 | 213 | 44 | 18 | 17.2 | 165 |
| -17 | 22.8 | 192 | 217 | 11 | 1 | 20.2 | 179 | 211 | 46 | 20 | 17.3 | 166 |
| -15 | 22.9 | 193 | 215 | 13 | 3 | 20.3 | 180 | 209 | 48 | 22 | 17.4 | 167 |
| -13 | 23.0 | 194 | 213 | 15 | 5 | 20.4 | 181 | 207 | 50 | 24 | 17.5 | 168 |
| -11 | 23.1 | 195 | 211 | 17 | 7 | 20.5 | 182 | 205 | 52 | 26 | 17.6 | 169 |
| -9 | 23.2 | 196 | 209 | 19 | 9 | 20.6 | 183 | 203 | 54 | 28 | 17.7 | 170 |
| -7 | 23.3 | 197 | 207 | 21 | 11 | 20.7 | 184 | 201 | 56 | 30 | 17.8 | 171 |
| -5 | 23.4 | 198 | 205 | 23 | 13 | 20.8 | 185 | 199 | 58 | 32 | 17.9 | 172 |
| -3 | 23.5 | 199 | 203 | 25 | 15 | 20.9 | 186 | 197 | 60 | 34 | 18.0 | 173 |
| -1 | 23.6 | 200 | 201 | 27 | 17 | 21.0 | 187 | 195 | 62 | 36 | 18.1 | 174 |
| 1 | 23.7 | 201 | 199 | 29 | 19 | 21.1 | 188 | 193 | 64 | 38 | 18.2 | 175 |
| 3 | 23.8 | 202 | 197 | 31 | 21 | 21.2 | 189 | 191 | 66 | 40 | 18.3 | 176 |
| 5 | 23.9 | 203 | 195 | 33 | 23 | 21.3 | 190 | 189 | 68 | 42 | 18.4 | 177 |
| 7 | 24.0 | 204 | 193 | 35 | 25 | 21.4 | 191 | 187 | 70 | 44 | 18.5 | 178 |
| 9 | 24.1 | 205 | 191 | 37 | 27 | 21.5 | 192 | 185 | 72 | 46 | 18.6 | 179 |
| 11 | 24.2 | 206 | 189 | 39 | 29 | 21.6 | 193 | 183 | 74 | 48 | 18.7 | 180 |
| 13 | 24.3 | 207 | 187 | 41 | 31 | 21.7 | 194 | 181 | 76 | 50 | 18.8 | 181 |
| 15 | 24.4 | 208 | 185 | 43 | 33 | 21.8 | 195 | 179 | 78 | 52 | 18.9 | 182 |
| 17 | 24.5 | 209 | 183 | 45 | 35 | 21.9 | 196 | 177 | 80 | 54 | 19.0 | 183 |
| 19 | 24.6 | 210 | 181 | 47 | 37 | 22.0 | 197 | 175 | 82 | 56 | 1 | |

| PRESS ALT. FEET | ISA - 36° F (-20° C) | | | | STANDARD DAY (ISA) | | | | ISA + 36° F (+20° C) | | | | | | |
|---------------------------|----------------------|-------------|-----------------------------------|------------|--------------------|-------------|-------------|-----------------------------------|----------------------|------------|-------------|-------------|-----------------------------------|------------|------------|
| | IOAT ° F | IOAT ° C | FUEL FLOW PER ENG GAL/HR | CAS KTS | TAS KTS | IOAT ° F | IOAT ° C | FUEL FLOW PER ENG GAL/HR | CAS KTS | TAS KTS | IOAT ° F | IOAT ° C | FUEL FLOW PER ENG GAL/HR | CAS KTS | TAS KTS |
| | | | | | | | | | | | | | | | |
| SL | 28 | -2 | 20.9 | 195 | 188 | 64 | 18 | 18.3 | 184 | 184 | 100 | 38 | 15.5 | 172 | 177 |
| 2000 | 23 | -5 | 21.3 | 197 | 195 | 57 | 14 | 18.7 | 185 | 191 | 93 | 34 | 15.9 | 173 | 184 |
| 4000 | 16 | -9 | 21.6 | 196 | 201 | 52 | 11 | 19.0 | 185 | 196 | 86 | 30 | 16.2 | 173 | 190 |
| 6000 | 9 | -13 | 21.8 | 196 | 206 | 45 | 7 | 19.2 | 185 | 201 | 81 | 27 | 16.4 | 173 | 195 |
| 8000 | 1 | -17 | 22.1 | 195 | 211 | 37 | 3 | 19.4 | 184 | 207 | 73 | 23 | 16.6 | 172 | 200 |
| 10,000 | -6 | -21 | 22.3 | 194 | 216 | 30 | -1 | 19.7 | 182 | 212 | 66 | 19 | 16.8 | 171 | 205 |
| 12,000 | -11 | -24 | 22.3 | 192 | 220 | 25 | -4 | 19.7 | 181 | 216 | 59 | 15 | 16.8 | 169 | 209 |
| 14,000 | -18 | -28 | 22.3 | 190 | 225 | 18 | -8 | 19.7 | 179 | 220 | 52 | 11 | 16.8 | 166 | 213 |
| 16,000 | -26 | -32 | 22.2 | 188 | 229 | 10 | -12 | 19.6 | 176 | 224 | 46 | 8 | 16.7 | 164 | 217 |
| 18,000 | -33 | -36 | 22.1 | 185 | 233 | 3 | -16 | 19.5 | 174 | 228 | 39 | 4 | 16.6 | 162 | 221 |
| 20,000 | -38 | -39 | 21.8 | 182 | 237 | -4 | -20 | 19.2 | 171 | 232 | 32 | 0 | 16.3 | 158 | 224 |
| 22,000 | -45 | -43 | 21.5 | 179 | 241 | -11 | -24 | 18.9 | 168 | 235 | 25 | -4 | 16.1 | 155 | 227 |
| 24,000 | -53 | -47 | 21.3 | 177 | 245 | -17 | -27 | 18.7 | 165 | 239 | 18 | -8 | 15.9 | 152 | 230 |
| 25,000 | -56 | -49 | 21.2 | 175 | 247 | -20 | -29 | 18.54 | 164 | 241 | 14 | -10 | 15.8 | 151 | 232 |

NOTES:

1. Fuel flows are to be used for flight planning only and will vary from engine to engine; lean using TIT.
2. Extend cowl flaps as required to maintain cylinder head temperatures at 420 F or less.
3. Cowl flaps full open reduce true airspeed by approximately 9 knots.
4. Cruise speeds are presented at an average weight of 5800 lbs.

RECOMMENDED CRUISE POWER 30 IN. HG, 2400 RPM

| PRESS ALT. FEET | ISA - 36° F (-20° C) | | | | STANDARD DAY (ISA) | | | | ISA + 36° F (+20° C) | | | |
|-----------------------|----------------------|-----|--------------------------|---------|--------------------|---------|---------|--------------------------|----------------------|---------|--------------------------|---------|
| | IOAT °F °C | | FUEL FLOW PER ENG GAL/HR | | CAS KTS | | TAS KTS | | IOAT °F °C | | FUEL FLOW PER ENG GAL/HR | |
| | °F | °C | PER ENG GAL/HR | CAS KTS | TAS KTS | IOAT °F | IOAT °C | FUEL FLOW PER ENG GAL/HR | CAS KTS | TAS KTS | IOAT °F | IOAT °C |
| SL | 28 | -2 | 18.7 | 187 | 180 | 64 | 18 | 16.2 | 176 | 176 | 100 | 38 |
| 2000 | 21 | -6 | 19.1 | 189 | 187 | 57 | 14 | 16.6 | 177 | 183 | 93 | 34 |
| 4000 | 14 | -10 | 19.4 | 189 | 193 | 50 | 10 | 16.8 | 178 | 188 | 86 | 30 |
| 6000 | 9 | -13 | 19.6 | 188 | 198 | 45 | 7 | 17.0 | 177 | 193 | 79 | 26 |
| 8000 | 1 | -17 | 19.8 | 187 | 203 | 37 | 3 | 17.2 | 176 | 198 | 73 | 23 |
| 10,000 | -6 | -21 | 19.9 | 186 | 207 | 30 | -1 | 17.3 | 175 | 203 | 66 | 19 |
| 12,000 | -13 | -25 | 20.1 | 185 | 212 | 23 | -5 | 17.5 | 174 | 208 | 59 | 15 |
| 14,000 | -18 | -28 | 20.1 | 183 | 216 | 16 | -9 | 17.5 | 172 | 212 | 52 | 11 |
| 16,000 | -26 | -32 | 20.1 | 181 | 221 | 10 | -12 | 17.5 | 170 | 216 | 45 | 7 |
| 18,000 | -33 | -36 | 20.0 | 179 | 225 | 3 | -16 | 17.4 | 167 | 220 | 39 | 4 |
| 20,000 | -40 | -40 | 19.8 | 176 | 229 | -4 | -20 | 17.2 | 164 | 223 | 32 | 0 |
| 22,000 | -45 | -43 | 19.6 | 173 | 232 | -11 | -24 | 17.0 | 162 | 227 | 25 | -4 |
| 24,000 | -53 | -47 | 19.3 | 170 | 236 | -18 | -28 | 16.7 | 158 | 230 | 18 | -8 |
| 25,000 | -56 | -49 | 19.1 | 168 | 238 | -22 | -30 | 16.6 | 157 | 231 | 14 | -10 |

NOTES:

1. Fuel flows are to be used for flight planning only and will vary from engine to engine; lean using TIT.
2. Extend cowl flaps as required to maintain cylinder head temperatures at 420° F or less.
3. Cowl flaps full open reduce true airspeed by approximately 9 knots.
4. Cruise speeds are presented at an average weight of 5800 lbs.

RECOMMENDED CRUISE POWER 30 IN. HG, 2200 RPM

| PRESS ALT. FEET | ISA - 36° F (-20° C) | | | | STANDARD DAY (ISA) | | | | ISA + 36° F (+20° C) | | | |
|-----------------------|----------------------|-----|-------------------------|-----|--------------------|-----|-------------------------|-----|----------------------|-----|-------------------------|-----|
| | IOAT | | FUEL FLOW PER ENG | | IOAT | | FUEL FLOW PER ENG | | IOAT | | FUEL FLOW PER ENG | |
| | ° F | ° C | GAL/HR | KTS | ° F | ° C | GAL/HR | KTS | ° F | ° C | GAL/HR | KTS |
| SL | 28 | -2 | 15.6 | 171 | 64 | 18 | 13.5 | 167 | 99 | 37 | 12.0 | 159 |
| 2000 | 21 | -6 | 15.9 | 177 | 57 | 14 | 13.7 | 167 | 93 | 34 | 12.1 | 165 |
| 4000 | 14 | -10 | 16.1 | 178 | 50 | 10 | 13.9 | 167 | 86 | 30 | 12.2 | 170 |
| 6000 | 7 | -14 | 16.3 | 178 | 43 | 6 | 14.1 | 166 | 79 | 26 | 12.3 | 175 |
| 8000 | 1 | -17 | 16.5 | 176 | 36 | 2 | 14.3 | 165 | 72 | 22 | 12.4 | 179 |
| 10,000 | -6 | -21 | 16.6 | 175 | 30 | -1 | 14.3 | 164 | 64 | 18 | 12.4 | 183 |
| 12,000 | -13 | -25 | 16.7 | 173 | 23 | -5 | 14.4 | 162 | 57 | 14 | 12.5 | 186 |
| 14,000 | -20 | -29 | 16.8 | 172 | 16 | -9 | 14.5 | 161 | 52 | 11 | 12.5 | 190 |
| 16,000 | -27 | -33 | 16.9 | 170 | 9 | -13 | 14.6 | 159 | 45 | 7 | 12.6 | 194 |
| 18,000 | -35 | -37 | 16.9 | 168 | 1 | -17 | 14.6 | 157 | 37 | 3 | 12.6 | 197 |
| 20,000 | -40 | -40 | 16.9 | 166 | -6 | -21 | 14.6 | 154 | 30 | -1 | 12.6 | 200 |
| 22,000 | -47 | -44 | 16.8 | 163 | -11 | -24 | 14.5 | 152 | 23 | -5 | 12.5 | 202 |
| 24,000 | -54 | -48 | 16.7 | 161 | -18 | -28 | 14.4 | 149 | 16 | -9 | 12.5 | 205 |
| 25,000 | -58 | -50 | 16.6 | 160 | -22 | -30 | 14.3 | 147 | 12 | -11 | 12.4 | 206 |

- NOTES:
1. Fuel flows are to be used for flight planning only and will vary from engine to engine; lean using TIT.
 2. Extend cowl flaps as required to maintain cylinder head temperatures at 420° F or less.
 3. Cowl flaps full open reduce true airspeed by approximately 9 knots.
 4. Cruise speeds are presented at an average weight of 5800 lbs.

RECOMMENDED CRUISE POWER 26 IN. HG, 2200 RPM

| PRESS ALT. FEET | ISA - 36° F (-20° C) | | | | STANDARD DAY (ISA) | | | | ISA + 36° F (+20° C) | | | |
|-----------------------|----------------------|-----|--------------|--------|--------------------|-----|--------------|--------|----------------------|-----|--------------|--------|
| | IOAT | | FUEL FLOW | | IOAT | | FUEL FLOW | | IOAT | | FUEL FLOW | |
| | ° F | ° C | PER ENG | GAL/HR | ° F | ° C | PER ENG | GAL/HR | ° F | ° C | PER ENG | GAL/HR |
| SL | 27 | -3 | 12.6 | 161 | 63 | 17 | 11.4 | 152 | 99 | 37 | 10.2 | 140 |
| 2000 | 19 | -7 | 12.7 | 162 | 55 | 13 | 11.5 | 153 | 91 | 33 | 10.3 | 140 |
| 4000 | 14 | -10 | 12.9 | 163 | 50 | 10 | 11.7 | 153 | 84 | 29 | 10.5 | 140 |
| 6000 | 7 | -14 | 13.1 | 163 | 43 | 6 | 11.8 | 153 | 77 | 25 | 10.6 | 140 |
| 8000 | 0 | -18 | 13.2 | 162 | 36 | 2 | 11.9 | 152 | 72 | 22 | 10.7 | 139 |
| 10,000 | -8 | -22 | 13.4 | 161 | 28 | -2 | 12.0 | 151 | 64 | 18 | 10.8 | 138 |
| 12,000 | -15 | -26 | 13.6 | 160 | 21 | -6 | 12.1 | 150 | 57 | 14 | 10.9 | 137 |
| 14,000 | -20 | -29 | 13.7 | 158 | 14 | -10 | 12.2 | 149 | 50 | 10 | 11.0 | 135 |
| 16,000 | -27 | -33 | 13.8 | 157 | 9 | -13 | 12.3 | 147 | 43 | 6 | 11.0 | 133 |
| 18,000 | -35 | -37 | 13.9 | 155 | 1 | -17 | 12.3 | 145 | 36 | 2 | 11.1 | 130 |
| 20,000 | -42 | -41 | 13.9 | 152 | -6 | -21 | 12.3 | 142 | 28 | -2 | 11.1 | 128 |
| 22,000 | -49 | -45 | 14.0 | 151 | -13 | -25 | 12.4 | 140 | 23 | -5 | 11.1 | 125 |
| 24,000 | -54 | -48 | 14.0 | 148 | -20 | -29 | 12.4 | 138 | 16 | -9 | 11.1 | 122 |
| 25,000 | -58 | -50 | 14.0 | 147 | -24 | -31 | 12.4 | 137 | 12 | -11 | 11.1 | 120 |
| | | | | 208 | | | | 202 | | | | 185 |
| | | | | 206 | | | | 198 | | | | 185 |
| | | | | 203 | | | | 194 | | | | 184 |
| | | | | 199 | | | | 191 | | | | 179 |
| | | | | 195 | | | | 187 | | | | 176 |
| | | | | 192 | | | | 183 | | | | 173 |
| | | | | 188 | | | | 179 | | | | 166 |
| | | | | 184 | | | | 175 | | | | 166 |
| | | | | 179 | | | | 171 | | | | 162 |
| | | | | 175 | | | | 167 | | | | 158 |
| | | | | 171 | | | | 162 | | | | 154 |
| | | | | 166 | | | | 157 | | | | 150 |
| | | | | 161 | | | | 152 | | | | 144 |

NOTES:

1. Fuel flows are to be used for flight planning only and will vary from engine to engine: lean using TIT.
2. Extend cowl flaps as required to maintain cylinder head temperatures at 420° F or less.
3. Cowl flaps full open reduce true airspeed by approximately 9 knots.
4. Cruise speeds are presented at an average weight of 5800 lbs.

ECONOMY CRUISE POWER 24 IN. HG, 2200 RPM

| PRESS ALT. FEET | ISA - 36° F (-20° C) | | | | STANDARD DAY (ISA) | | | | ISA + 36° F (+20° C) | | | |
|-----------------------|----------------------|-----------------------------------|------------|------------|--------------------|-----------------------------------|------------|------------|----------------------|-----------------------------------|------------|------------|
| | IOAT ° F ° C | FUEL FLOW PER ENG GAL/HR | CAS KTS | TAS KTS | IOAT ° F ° C | FUEL FLOW PER ENG GAL/HR | CAS KTS | TAS KTS | IOAT ° F ° C | FUEL FLOW PER ENG GAL/HR | CAS KTS | TAS KTS |
| | | | | | | | | | | | | |
| SL | 27 -3 | 11.4 | 154 | 149 | 63 17 | 10.3 | 143 | 143 | 99 37 | 9.2 | 127 | 132 |
| 2000 | 19 -7 | 11.5 | 155 | 154 | 55 13 | 10.5 | 144 | 148 | 91 33 | 9.3 | 130 | 138 |
| 4000 | 12 -11 | 11.7 | 155 | 158 | 48 9 | 10.6 | 144 | 153 | 84 29 | 9.5 | 130 | 143 |
| 6000 | 7 -14 | 11.8 | 155 | 163 | 41 5 | 10.7 | 143 | 156 | 77 25 | 9.6 | 130 | 147 |
| 8000 | 0 -18 | 11.9 | 154 | 167 | 36 2 | 10.8 | 142 | 160 | 70 21 | 9.6 | 129 | 150 |
| 10,000 | -8 -22 | 12.0 | 154 | 172 | 28 -2 | 10.9 | 142 | 164 | 63 17 | 9.7 | 127 | 153 |
| 12,000 | -15 -26 | 12.1 | 152 | 175 | 21 -6 | 11.0 | 140 | 168 | 57 14 | 9.8 | 126 | 156 |
| 14,000 | -22 -30 | 12.2 | 151 | 179 | 14 -10 | 11.1 | 139 | 172 | 50 10 | 9.9 | 124 | 160 |
| 16,000 | -30 -34 | 12.3 | 150 | 184 | 7 -14 | 11.2 | 138 | 176 | 43 6 | 10.0 | 122 | 162 |
| 18,000 | -35 -37 | 12.4 | 149 | 188 | 0 -18 | 11.3 | 136 | 179 | 36 2 | 10.1 | 120 | 164 |
| 20,000 | -42 -41 | 12.5 | 147 | 192 | -8 -22 | 11.3 | 134 | 182 | 28 -2 | 10.1 | 117 | 166 |
| 22,000 | -49 -45 | 12.5 | 145 | 196 | -13 -25 | 11.4 | 132 | 186 | 21 -6 | 10.2 | 114 | 167 |
| 24,000 | -56 -49 | 12.6 | 143 | 200 | -20 -29 | 11.4 | 130 | 189 | 14 -10 | 10.2 | 109 | 166 |
| 25,000 | -60 -51 | 12.6 | 142 | 202 | -24 -31 | 11.5 | 128 | 190 | 10 -12 | 10.2 | 106 | 165 |

- NOTES:
1. Fuel flows are to be used for flight planning only and will vary from engine to engine; lean using TIT.
 2. Extend cowl flaps as required to maintain cylinder head temperatures at 420 F or less.
 3. Cowl flaps full open reduce true airspeed by approximately 9 knots.
 4. Cruise speeds are presented at an average weight of 5800 lbs.

RANGE PROFILE - 190 GALLONS

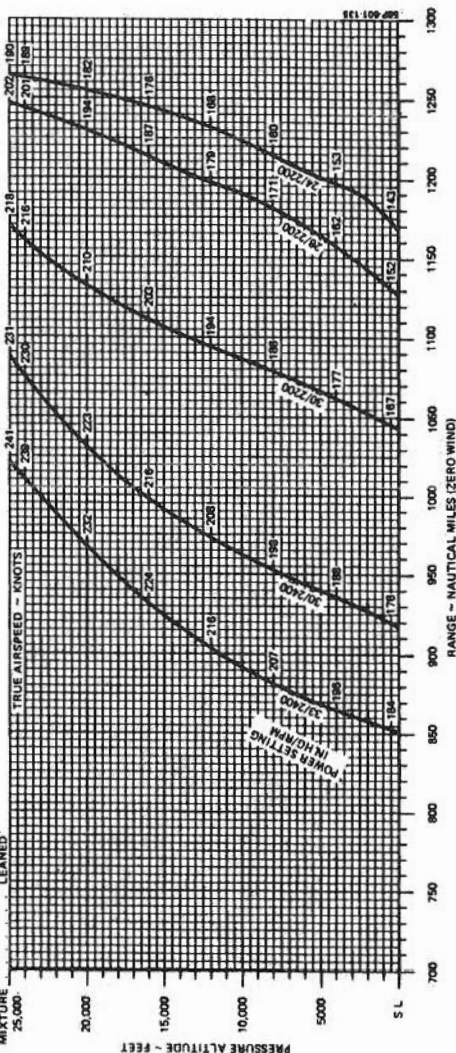
ASSOCIATED CONDITIONS:

WEIGHT 6132 LBS BEFORE ENGINE START
FUEL AVIATION GASOLINE
FUEL DENSITY 6.0 LBS/GAL
INITIAL FUEL LOADING 190 U.S. GAL (1140 LBS)
COWL FLAPS CLOSED
MIXTURE LEANED

STANDARD DAY (ISA)

NOTE:

RANGE INCLUDES START, TAXI, CLIMB
AND DESCENT WITH 45 MINUTES
RESERVE FUEL AT ECONOMY CRUISE (24/2200)



Section V Performance

**BEECHCRAFT
Baron 58P**

RANGE PROFILE - 166 GALLONS

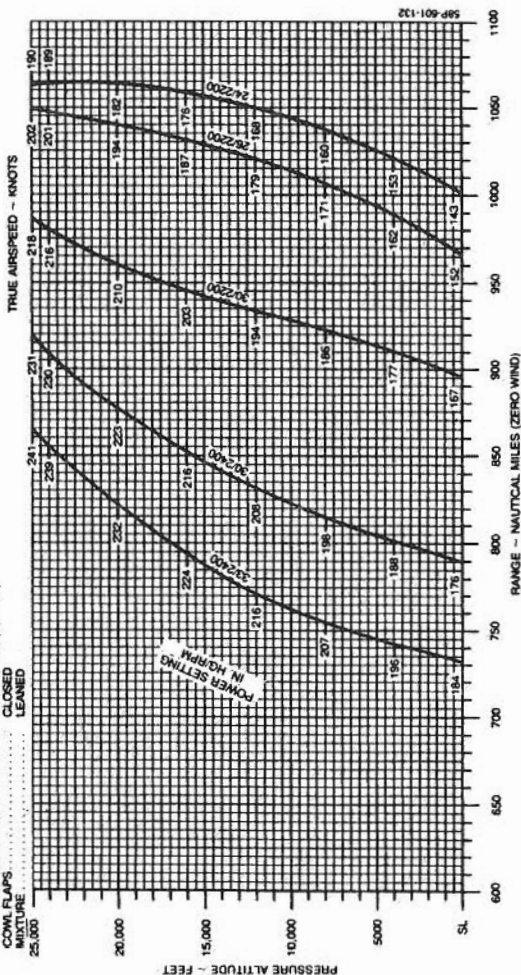
STANDARD DAY (ISA)

ASSOCIATED CONDITIONS:

WEIGHT 6132 LBS BEFORE ENGINE START
FUEL AVIATION GASOLINE
FUEL DENSITY 6.0 LBS/GAL
INITIAL FUEL LOADING 166 U.S. GAL (996 LBS)
COWL FLAPS CLOSED
MIXTURE LEANED

NOTE:

RANGE INCLUDES START, TAXI, CLIMB
AND DESCENT WITH 45 MINUTES
RESERVE FUEL AT ECONOMY CRUISE (24-2200)



RANGE PROFILE — 100 GALLONS

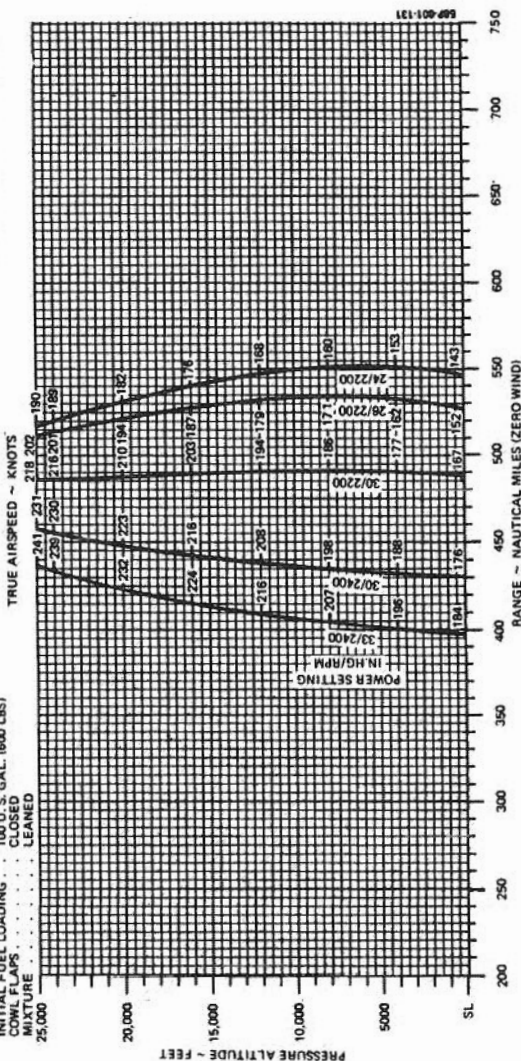
STANDARD DAY (ISA)

ASSOCIATED CONDITIONS:

WEIGHT 6132 LBS BEFORE ENGINE START
FUEL AVIATION GASOLINE
FUEL DENSITY 6.0 LBS/GAL
INITIAL FUEL LOADING 100 U.S. GAL. (600 LBS)
COWL FLAPS CLOSED
MIXTURE LEANED

NOTE:

RANGE INCLUDES START, TAXI, CLIMB
AND DESCENT WITH 45 MINUTES
RESERVE FUEL AT ECONOMY CRUISE (24/2200)



Section V Performance

**BEECHCRAFT
Baron 58P**

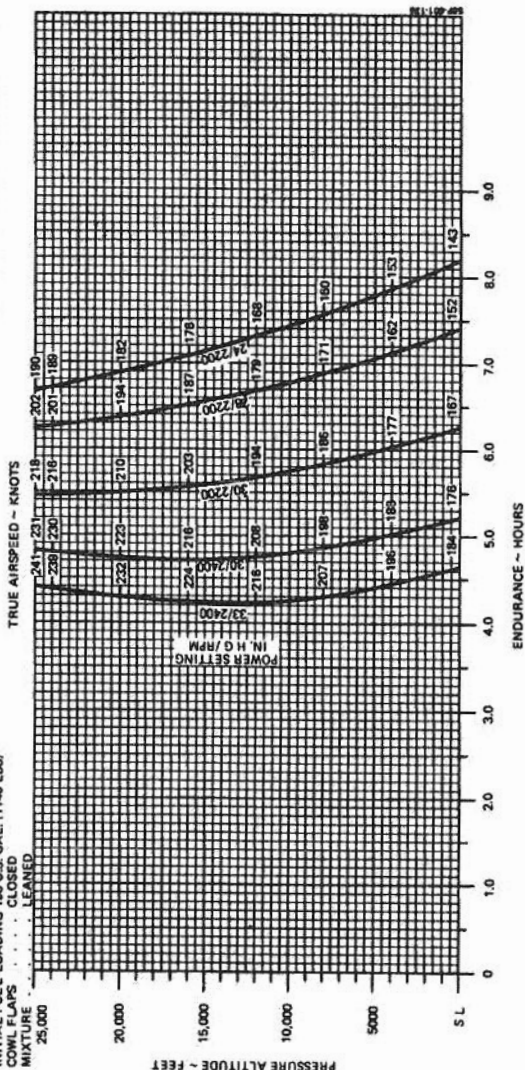
ENDURANCE PROFILE—190 GALLONS STANDARD DAY (ISA)

ASSOCIATED CONDITIONS:

WEIGHT 6132 LBS BEFORE ENGINE START
FUEL AVIATION GASOLINE
FUEL DENSITY 6.0 LBS/GAL
INITIAL FUEL LOADING 190 U.S. GAL. (1140 LBS)
COWL FLAPS CLOSED
MIXTURE LEANED

NOTE:

ENDURANCE INCLUDES START, TAXI, CLIMB
AND DESCENT WITH 45 MINUTES
RESERVE FUEL AT ECONOMY CRUISE (24/2200)



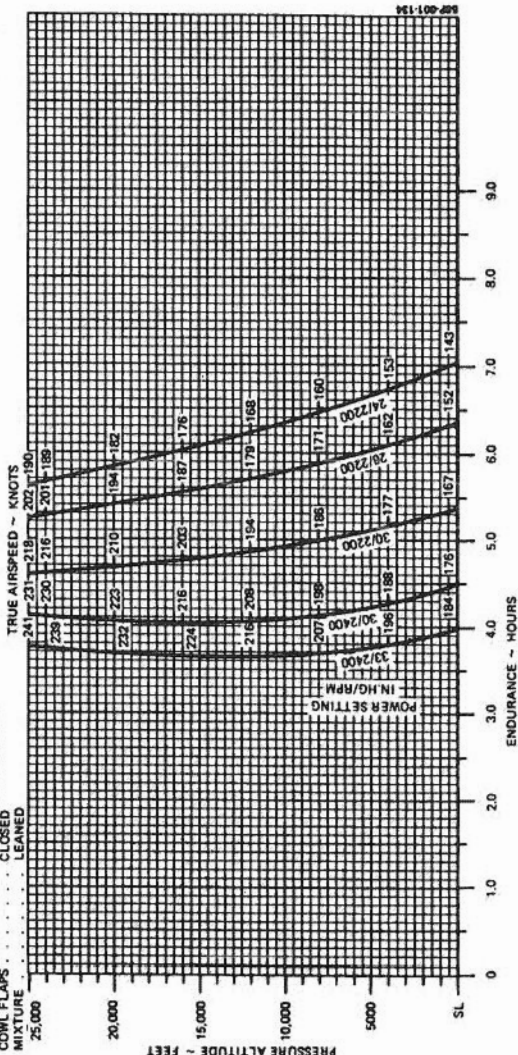
ENDURANCE PROFILE — 166 GALLONS STANDARD DAY (ISA)

ASSOCIATED CONDITIONS:

WEIGHT 6132 LBS BEFORE ENGINE START
FUEL AVIATION GASOLINE
FUEL DENSITY 6.0 LBS/GAL
INITIAL FUEL LOADING . . . 166 U. S. GAL (996 LBS)
COWL FLAPS CLOSED
MIXTURE LEANED

NOTE:

ENDURANCE INCLUDES START, TAXI, CLIMB
AND DESCENT WITH 45 MINUTES
RESERVE FUEL AT ECONOMY CRUISE (24/2200)



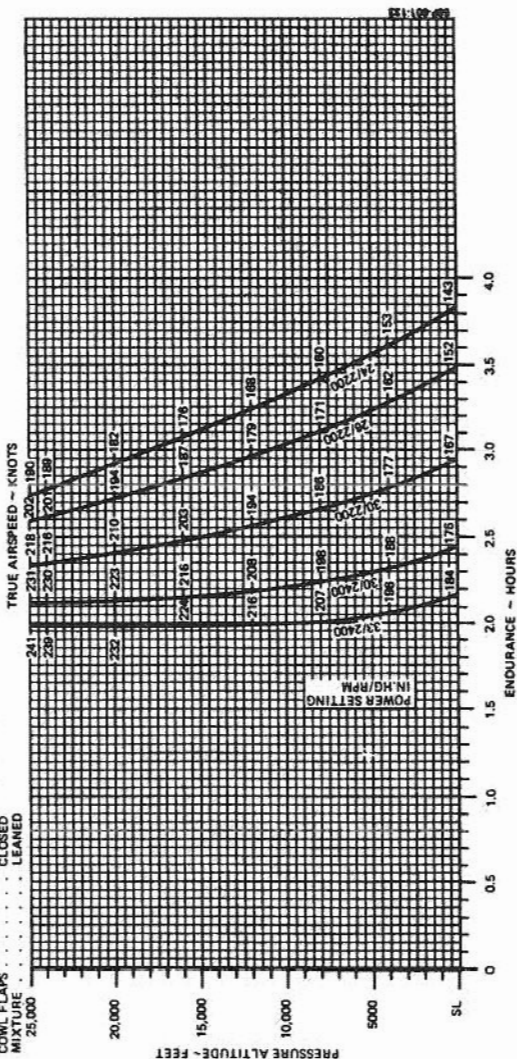
ENDURANCE PROFILE — 100 GALLONS STANDARD DAY (ISA)

ASSOCIATED CONDITIONS:

WEIGHT 6132 LBS BEFORE ENGINE START
FUEL AVIATION GASOLINE
FUEL DENSITY 6.0 LBS/GAL
INITIAL FUEL LOADING 100 U.S. GAL. (600 LBS)
COWL FLAPS CLOSED
MIXTURE LEANED

NOTE:

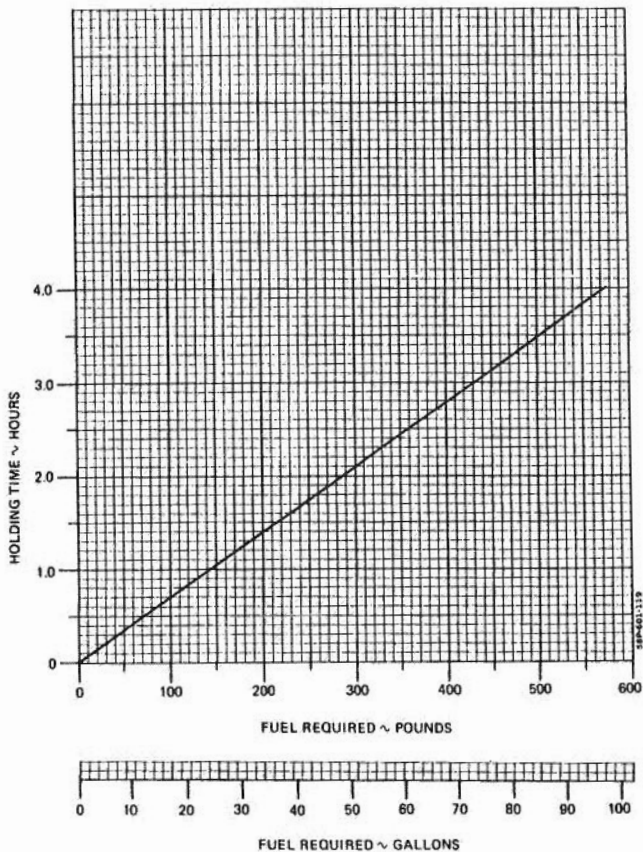
ENDURANCE INCLUDES START, TAXI, CLIMB
AND DESCENT WITH 45 MINUTES
RESERVE FUEL AT ECONOMY CRUISE (24/2200)



HOLDING TIME

ASSOCIATED CONDITIONS:

MANIFOLD PRESSURE 24 IN. HG
PROPELLER SPEED 2200 RPM
FUEL FLOW PER ENG 12 GAL/HR
APPLICABLE FOR ALL TEMPERATURES AND ALTITUDES



DESCENT

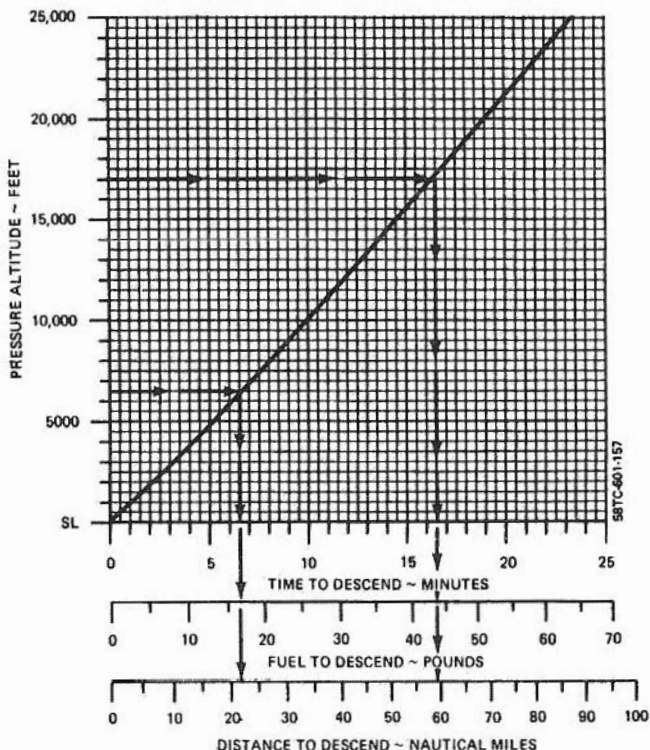
ASSOCIATED CONDITIONS:

POWER 30 IN. HG AND 2200
RPM ABOVE 10,000 FT
AS REQUIRED
FOR LESS THAN
1000 FT/MIN BELOW
10,000 FT
FLAPS UP (0°)
LANDING GEAR . . UP

EXAMPLE:

INITIAL ALTITUDE . . 17,000 FT
FINAL ALTITUDE . . . 5850 FT
TIME TO DESCEND . . (16.5-6.5) = 10 MIN
FUEL TO DESCEND . . (44-18) = 28 LBS
DISTANCE TO
DESCEND (59-21) = 38 NM

DESCENT SPEED 190 KNOTS
(DECREASE 4 KNOTS PER 1000 FT ABOVE 17,000 FT)



BEECHCRAFT Baron 58P

Section V Performance

LANDING DISTANCE - FLAPS 30°

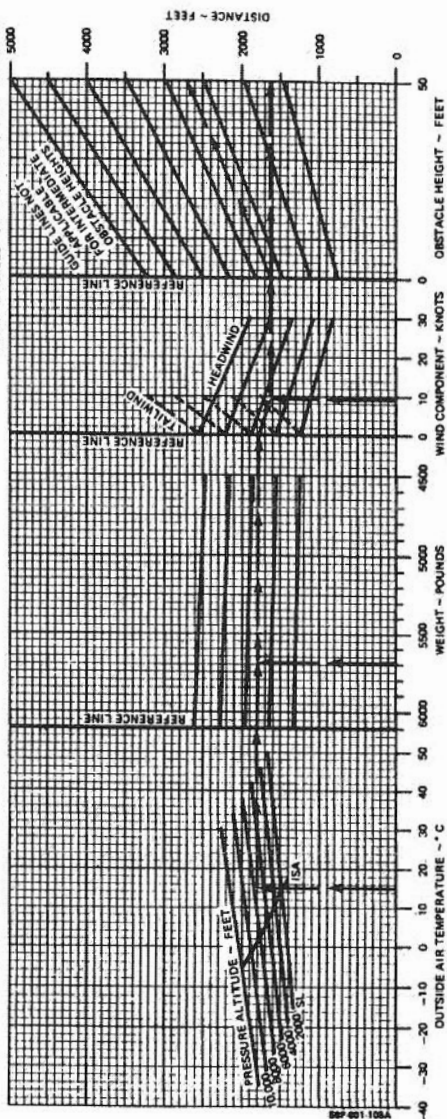
ASSOCIATED CONDITIONS:

POWER RETARD TO MAINTAIN 1000 FT/MIN
FLAPS DOWN (30°)
RUNWAY PAVED, LEVEL, DRY SURFACE
APPROACH SPEED IAS AS TABULATED
BRAKING MAXIMUM

| WEIGHT ~ LBS | APPROACH SPEED ~ KTS |
|--------------|----------------------|
| 6100 | 100 |
| 5600 | 98 |
| 5100 | 96 |
| 4600 | 94 |

EXAMPLE:

OAT 15°C
PRESSURE ALTITUDE 5650 FT
LANDING WEIGHT 5702 LBS
HEADWIND COMPONENT 9.5 KTS
GROUND ROLL 1610 FT
TOTAL OVER 50 FT OBSTACLE 2890 FT
APPROACH SPEED 96 KTS



SEP 001 105A

Section V
Performance

BEECHCRAFT
Baron 58P

LANDING DISTANCE - FLAPS 0°

| WEIGHT ~ POUNDS | APPROACH SPEED ~ KNOTS |
|-----------------|------------------------|
| 6100 | 104 |
| 6000 | 104 |
| 5500 | 103 |
| 5000 | 103 |
| 4500 | 102 |

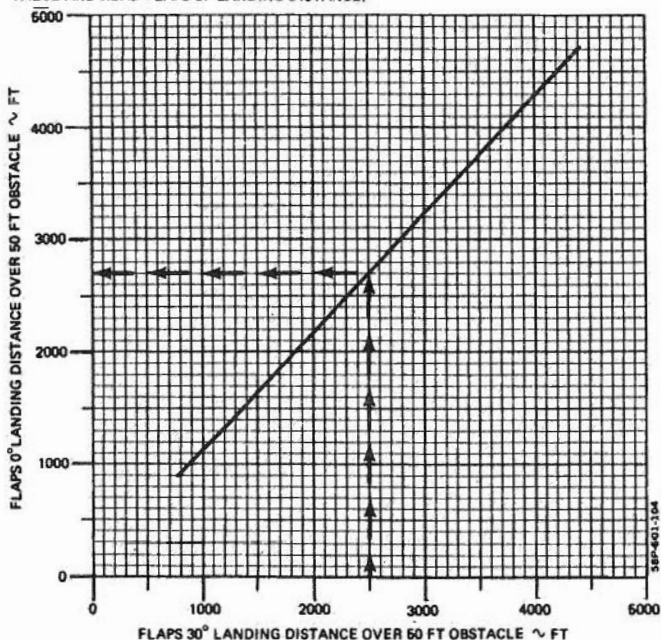
ASSOCIATED CONDITIONS:

POWER RETARD TO MAINTAIN
800 FT/MIN ON
FINAL APPROACH
FLAPS UP (0°)
RUNWAY PAVED, LEVEL,
DRY SURFACE
APPROACH SPEED IAS AS TABULATED
BRAKING MAXIMUM

EXAMPLE:

FLAPS 30° LANDING
DISTANCE OVER
50 FT OBSTACLE 2500 FEET
LANDING WEIGHT 5702 LBS
FLAPS 0° LANDING
DISTANCE OVER
50 FT OBSTACLE 2720 FEET
APPROACH SPEED 103 KNOTS

NOTE: TO DETERMINE FLAPS UP LANDING DISTANCE, READ FROM THE LANDING DISTANCE - FLAPS 30 DEGREES GRAPH, THE LANDING DISTANCE APPROPRIATE TO OAT, ALTITUDE, WEIGHT, WIND AND 50 FT OBSTACLE. ENTER THIS GRAPH WITH DERIVED VALUE AND READ FLAPS UP LANDING DISTANCE.



LANDING DISTANCE - FLAPS 30° GRASS SURFACE

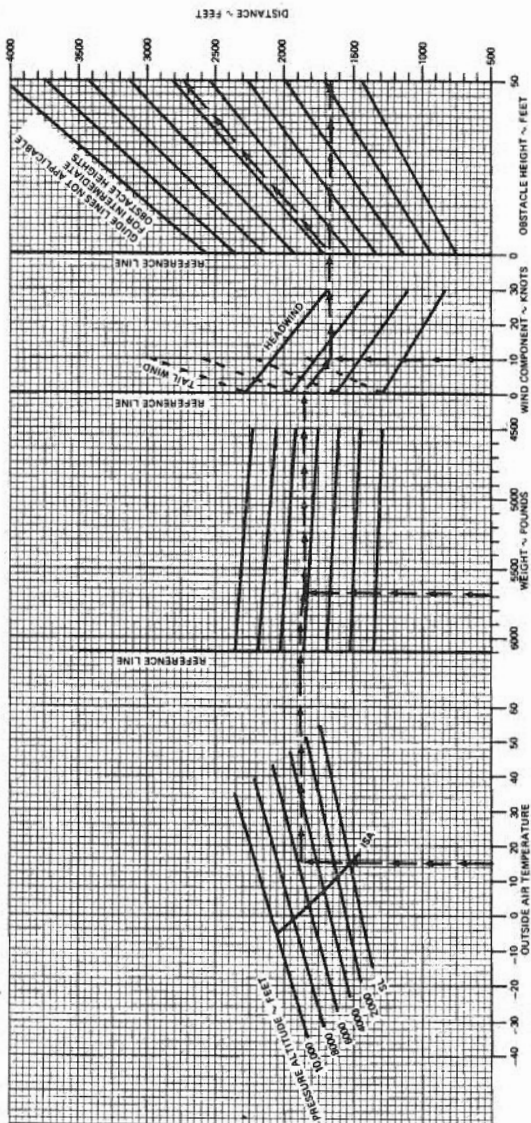
EXAMPLE

| | |
|---------------------------|-----------|
| 15°C | 10 KNOTS |
| PRESSURE ALTITUDE | 5500 FEET |
| LANDING WEIGHT | 5700 LBS |
| HEADWIND COMPONENT | 10 KNOTS |
| GROUND ROLL | 1660 FEET |
| TOTAL OVER 50 FT OBSTACLE | 2730 FEET |
| APPROACH SPEED | 100 KNOTS |

| WEIGHT ~ POUNDS | APPROACH SPEED ~ KNOTS |
|-----------------|------------------------|
| 6100 | 100 |
| 6000 | 100 |
| 5500 | 99 |
| 5000 | 99 |
| 4500 | 98 |

ASSOCIATED CONDITIONS

- POWER RETARD TO MAINTAIN 1000 FT/MIN
- FLAPS DOWN 30°
- RUNWAY SHORT, DRY, GRASS
- APPROACH SPEED IAS AS TABULATED
- BRAKING MAXIMUM



LANDING DISTANCE - FLAPS 0° GRASS SURFACE

| WEIGHT ~ POUNDS | APPROACH SPEED ~ KNOTS |
|-----------------|------------------------|
| 8100 | 104 |
| 8000 | 104 |
| 5600 | 103 |
| 5000 | 103 |
| 4500 | 102 |

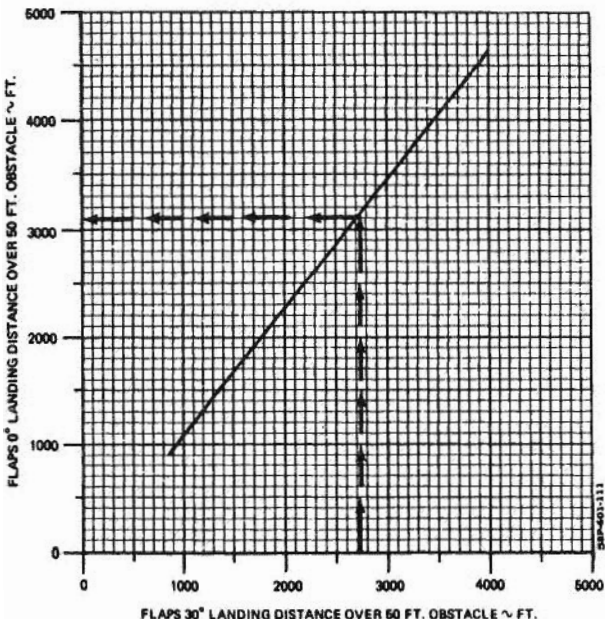
ASSOCIATED CONDITIONS:

POWER RETARD TO MAINTAIN
800 FT/MIN ON FINAL
APPROACH
FLAPS UP (0°)
RUNWAY SHORT, DRY GRASS
APPROACH SPEED . . . IAS AS TABULATED
BRAKING MAXIMUM

EXAMPLE:

FLAPS 30° LANDING
DISTANCE OVER
50 FT. OBSTACLE . . . 2730 FEET
LANDING WEIGHT . . . 5702 LBS
FLAPS 0° LANDING
DISTANCE OVER
50 FT OBSTACLE . . . 3110 FEET
APPROACH SPEED . . . 104 KNOTS

NOTE: TO DETERMINE FLAPS UP LANDING DISTANCE READ FROM THE LANDING DISTANCE - FLAPS 30° GRAPH, THE LANDING DISTANCE APPROPRIATE TO OAT, ALTITUDE, WEIGHT, WIND, AND 50 FT OBSTACLE. ENTER THIS GRAPH WITH DERIVED VALUE AND READ FLAPS UP LANDING DISTANCE.



SECTION VI

WEIGHT AND BALANCE/ EQUIPMENT LIST

TABLE OF CONTENTS

| <i>SUBJECT</i> | <i>PAGE</i> |
|--|-------------|
| Airplane Weighing Procedure | 6-3 |
| Basic Empty Weight and Balance Form | 6-5 |
| Weight and Balance Record | 6-7 |
| Loading Instructions | 6-9 |
| Moment Limits vs Weight Graph | 6-10 |
| Moment Limits vs Weight Table | 6-11 |
| Computing Procedure | 6-12 |
| Sample Weight and Balance Loading Form | 6-13 |
| Weight and Balance Loading Form | 6-14 |
| Useful Load Data | |
| Occupants | 6-15 |
| Baggage and Cargo | 6-16 |
| Usable Fuel | 6-17 |
| Airplane Papers (furnished with individual airplane) | |

INTENTIONALLY LEFT BLANK

AIRPLANE WEIGHING PROCEDURE

Periodic weighing of the Pressurized Baron 58P may be required to keep the Basic Empty Weight current. All changes to the airplane affecting weight and/or 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 the Empty Weight is 30.3 pounds at Fuselage Station 78.5.

3. Engine oil must be at the full level in each engine. Total engine oil aboard when both engines are full is 49 pounds at Fuselage Station 37.0.

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.

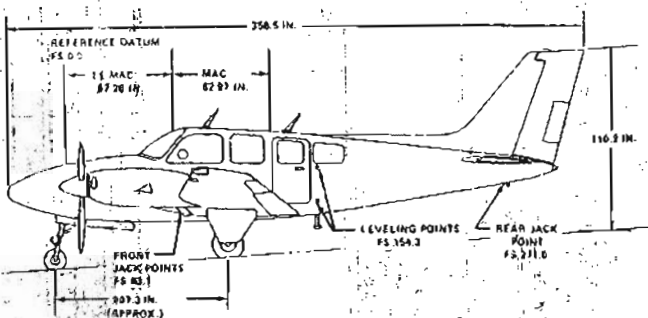
5. The airplane must be in a level attitude at the time of weighing. Leveling screws are located on the left side of the fuselage at approximately Fuselage Station 154.3. Level attitude is determined with a plumb bob.

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 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 -10.6 for the nose wheel.

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



BEECHCRAFT
Baron 58P

Section VI
Wt & Bal/Equip List

AIRCRAFT BASIC EMPTY WEIGHT AND BALANCE

BARON 58P
SER. NO. _____ REG. NO. _____ DATE _____
STRUT POSITION - NOSE MAIN JACK POINT LOCATION PREPARED BY _____
EXTENDED -11.6 96.0 FORWARD 83.1 Company _____
COMPRESSED -9.8 97.0 AFT 271.0 Signature _____

| REACTION | SCALE READING | TARE | NET WEIGHT | ARM | MOMENT |
|--|------------------|------|------------|------|--------|
| WHEEL - JACK POINTS | | | | | |
| LEFT MAIN | | | | | |
| RIGHT MAIN | | | | | |
| NOSE OR TAIL | | | | | |
| TOTAL (AS WEIGHED) | | | | | |
| Space below provided for additions and subtractions to as weighed condition. | | | | | |
| EMPTY WEIGHT | | | | | |
| ENGINE OIL | | | 49 | 37.0 | 1813 |
| UNUSABLE FUEL | | | 36 | 79.0 | 2844 |
| BASIC EMPTY WEIGHT | | | | | |

98-37704

NOTE

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

The current equipment list and basic 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 basic empty weight and c.g. and that an inventory of installed equipment be conducted to create a new equipment list.

Section VI
Wt & Bal Equip List

SERIAL NO.

REGISTRACIÓN NO.

PAGE NO.

[illegible]

BEECHCRAFT
Baron 58P

WEIGHT AND BALANCE RECORD

SERIAL NO.

REGISTRATION NO.

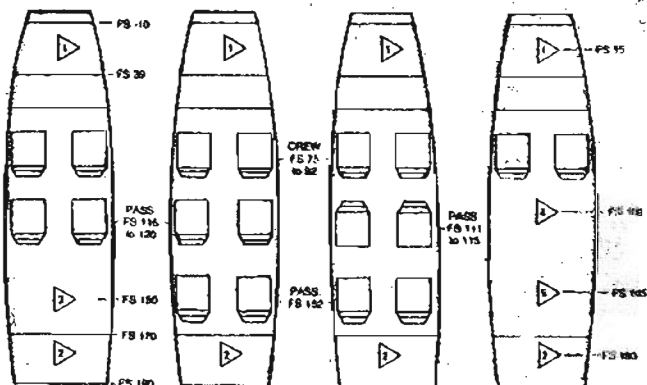
PAGE NO

[illegible]

LOADING INSTRUCTIONS

It is the responsibility of the airplane operator to assure 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 basic empty weight and moment of the airplane at the time of delivery are shown on the airplane Basic Empty Weight and Balance form. Useful load items which may be loaded into the airplane are shown on the Useful Load Weight and Moment tables. The minimum and maximum moments are shown on the Moment Limits vs Weight graph or 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.

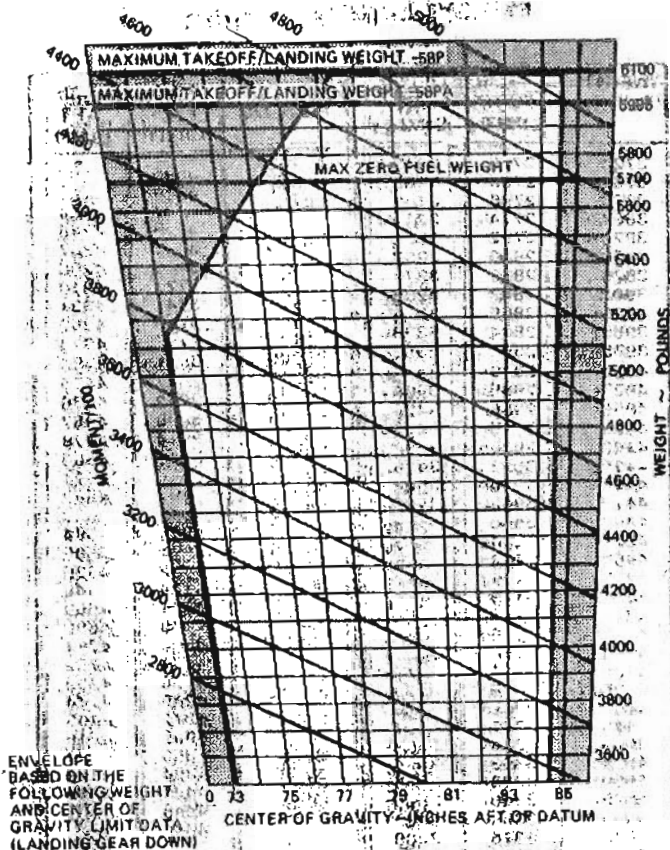


- 1. MAXIMUM WEIGHT 300 POUNDS INCLUDING EQUIPMENT AND BAGGAGE
- 2. MAXIMUM WEIGHT 120 POUNDS INCLUDING EQUIPMENT AND BAGGAGE
- 3. MAXIMUM WEIGHT 400 POUNDS INCLUDING EQUIPMENT AND BAGGAGE
- 4. MAXIMUM WEIGHT 200 POUNDS FORWARD OF CPAR INCLUDING EQUIPMENT AND CARGO WITH CENTER SEATS REMOVED
- 5. MAXIMUM WEIGHT 400 POUNDS AFT OF CPAR INCLUDING EQUIPMENT AND CARGO WITH CENTER AND AFT SEATS REMOVED

Section VI
Wt & Bal/Equip List

BEECHCRAFT
Baron 58P

MOMENT LIMITS VS WEIGHT



BARON 58P

| WEIGHT CONDITION | FORWARD CG LIMIT | AFT CG LIMIT |
|---------------------------------------|------------------|--------------|
| 6100 LBS (MAXIMUM TAKEOFF OR LANDING) | 78.4 | 84.5 |
| 6150 LBS OR LESS | 73.0 | 84.5 |

BARON 58PA

| WEIGHT CONDITION | FORWARD CG LIMIT | AFT CG LIMIT |
|---------------------------------------|------------------|--------------|
| 5995 LBS (MAXIMUM TAKEOFF OR LANDING) | 77.8 | 84.5 |
| 6150 LBS OR LESS | 73.0 | 84.5 |

October 1976

MOMENT LIMITS vs WEIGHT

| WEIGHT POUNDS | MOMENT/100 | | WEIGHT POUNDS | MOMENT/100 | |
|------------------|--------------|--------------|------------------|--------------|--------------|
| | FWD LIMIT | AFT LIMIT | | FWD LIMIT | AFT LIMIT |
| 3725 | 2719 | 3148 | 4925 | 3595 | 4182 |
| 3750 | 2738 | 3169 | 4950 | 3614 | 4193 |
| 3775 | 2796 | 3190 | 4975 | 3632 | 4204 |
| 3800 | 2774 | 3211 | 5025 | 3668 | 4248 |
| 3825 | 2792 | 3232 | 5050 | 3686 | 4267 |
| 3850 | 2810 | 3253 | 5075 | 3705 | 4288 |
| 3875 | 2829 | 3274 | 5100 | 3723 | 4310 |
| 3900 | 2847 | 3296 | 5125 | 3741 | 4331 |
| 3925 | 2865 | 3317 | 5150 | 3760 | 4352 |
| 3950 | 2884 | 3338 | 5175 | 3785 | 4373 |
| 3975 | 2902 | 3359 | 5200 | 3811 | 4394 |
| 4000 | 2920 | 3380 | 5225 | 3837 | 4416 |
| 4025 | 2938 | 3401 | 5250 | 3862 | 4436 |
| 4050 | 2956 | 3422 | 5275 | 3888 | 4457 |
| 4075 | 2975 | 3443 | 5300 | 3914 | 4478 |
| 4100 | 2993 | 3464 | 5325 | 3940 | 4500 |
| 4125 | 3011 | 3486 | 5350 | 3966 | 4521 |
| 4150 | 3030 | 3507 | 5375 | 3992 | 4542 |
| 4175 | 3048 | 3528 | 5400 | 4019 | 4563 |
| 4200 | 3066 | 3549 | 5425 | 4045 | 4584 |
| 4225 | 3084 | 3570 | 5450 | 4071 | 4605 |
| 4250 | 3102 | 3591 | 5475 | 4098 | 4626 |
| 4275 | 3121 | 3612 | 5500 | 4124 | 4648 |
| 4300 | 3139 | 3634 | 5525 | 4151 | 4669 |
| 4325 | 3157 | 3655 | 5550 | 4178 | 4690 |
| 4350 | 3176 | 3676 | 5575 | 4204 | 4711 |
| 4375 | 3194 | 3697 | 5600 | 4231 | 4732 |
| 4400 | 3212 | 3718 | 5625 | 4258 | 4753 |
| 4425 | 3230 | 3739 | 5650 | 4285 | 4774 |
| 4450 | 3248 | 3760 | 5675 | 4312 | 4795 |
| 4475 | 3267 | 3781 | 5700 | 4339 | 4816 |
| 4500 | 3285 | 3802 | 5725 | 4366 | 4838 |
| 4525 | 3303 | 3823 | 5750 | 4394 | 4859 |
| 4550 | 3322 | 3845 | 5775 | 4421 | 4880 |
| 4575 | 3340 | 3866 | 5800 | 4448 | 4901 |
| 4600 | 3358 | 3887 | 5825 | 4476 | 4922 |
| 4625 | 3376 | 3908 | 5850 | 4503 | 4943 |
| 4650 | 3394 | 3929 | 5875 | 4531 | 4964 |
| 4675 | 3413 | 3950 | 5900 | 4559 | 4986 |
| 4700 | 3431 | 3972 | 5925 | 4586 | 5007 |
| 4725 | 3449 | 3993 | 5950 | 4614 | 5028 |
| 4750 | 3468 | 4014 | 5975 | 4642 | 5049 |
| 4775 | 3486 | 4035 | 5995 | 4664 | 5066 |
| 4800 | 3504 | 4056 | 6000 | 4670 | 5070 |
| 4825 | 3522 | 4077 | 6025 | 4698 | 5091 |
| 4850 | 3540 | 4098 | 6050 | 4726 | 5112 |
| 4875 | 3559 | 4119 | 6075 | 4754 | 5133 |
| 4900 | 3577 | 4140 | 6100 | 4782 | 5154 |

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-TOTALS are the ZERO FUEL CONDITION.

4. Determine the weight and corresponding moment for the total fuel loading to be used. Add the Total Fuel Loading Condition 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 TO DESTINATION from the take-off weight and moment. (Determine the weight and moment of this fuel by subtracting the amount on board at landing from the amount on board at takeoff.) The Zero Fuel Condition, the Take-off Condition and the Landing Condition moment must all be within the minimum and maximum moments shown on the Moment Limits vs Weight graph or 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.

BEECHCRAFT
Baron 58P

Section VI
Wt & Bal/Equip List

WEIGHT AND BALANCE LOADING FORM

BARON 58P DATE 0/0/00
SERIAL NO. TJ-00 REG. NO. NXXXXX

| ITEM | WEIGHT | MOM/100 |
|---|--------|---------|
| 1. BASIC EMPTY CONDITION | 4321 | 3197 |
| 2. FRONT SEAT OCCUPANTS | 340 | 255 |
| 3. 3rd & 4th SEAT OCCUPANTS FWD FACING | 260 | 304 |
| 4. 3rd & 4th SEAT OCCUPANTS AFT FACING | --- | --- |
| 5. 5th & 6th SEAT OCCUPANTS | --- | --- |
| 6. NOSE BAGGAGE | 90 | 14 |
| 7. AFT BAGGAGE | 120 | 216 |
| 8. CARGO | --- | --- |
| 9. SUB TOTAL ZERO FUEL CONDITION (5700 LBS MAX.) | 5131 | 3986 |
| 10. FUEL LOADING (168 gal.) | 996 | 824 |
| 11. SUB TOTAL RAMP CONDITION | 6127 | 4810 |
| 12. *LESS FUEL FOR START, AND TAXI | -32 | -26 |
| 13. SUB TOTAL TAKE-OFF CONDITION | 6095 | 4784 |
| 14. LESS FUEL TO DESTINATION (69 gal.) | -414 | -349 |
| 15. LANDING CONDITION | 5881 | 4435 |

*Fuel for start and taxi is normally 32 lbs at an average mom/100 of 26

Section VI
Wt & Bal/Equip List

BEECHCRAFT
Baron 58P

WEIGHT AND BALANCE LOADING FORM

BARON _____ DATE _____
SERIAL NO. _____ REG. NO. _____

| ITEM | WEIGHT | MOM/100 |
|---|--------|---------|
| 1. BASIC EMPTY CONDITION | | |
| 2. FRONT SEAT OCCUPANTS | | |
| 3. 3rd & 4th SEAT OCCUPANTS FWD FACING | | |
| 4. 3rd & 4th SEAT OCCUPANTS AFT FACING | | |
| 5. 5th & 6th SEAT OCCUPANTS | | |
| 6. NOSE BAGGAGE | | |
| 7. AFT BAGGAGE | | |
| 8. CARGO | | |
| 9. SUB TOTAL ZERO FUEL CONDITION (5700 LBS MAX.) | | |
| 10. FUEL LOADING | | |
| 11. SUB TOTAL RAMP CONDITION | | |
| 12. *LESS FUEL FOR START, AND TAXI | | |
| 13. SUB TOTAL TAKE-OFF CONDITION | | |
| 14. LESS FUEL TO DESTINATION | | |
| 15. LANDING CONDITION | | |

*Fuel for start and taxi is normally 32 lbs at an average mom/100 of 26

USEFUL LOAD WEIGHTS & MOMENTS
OCCUPANTS

| | FRONT SEATS | | STANDARD SEATING | | | | CLUB SEATING | | | |
|--------|---------------------|--------------------|-------------------------------|---------------------|----------------------|---------------------|-------------------------------|---------------------|----------------------|---------------------|
| | | | 3RD & 4TH SEATS FWD FACING | | 5TH & 6TH SEATS | | 3RD & 4TH SEATS AFT FACING | | 5TH & 6TH SEATS | |
| | FWD. POS. ARM 75 | AFT POS. ARM 82 | FWD. POS. ARM 115 | AFT POS. ARM 120 | FWD. POS. ARM 115 | AFT POS. ARM 120 | FWD. POS. ARM 111 | AFT POS. ARM 115 | FWD. POS. ARM 111 | AFT POS. ARM 115 |
| WEIGHT | MOMENT 100 | | | | | | | | | |
| 100 | 75 | 82 | 115 | 120 | 152 | 111 | 115 | 152 | 115 | 152 |
| 110 | 82 | 90 | 126 | 132 | 167 | 122 | 126 | 167 | 126 | 167 |
| 120 | 90 | 98 | 138 | 144 | 182 | 133 | 138 | 182 | 138 | 182 |
| 130 | 98 | 106 | 150 | 156 | 198 | 144 | 150 | 198 | 150 | 198 |
| 140 | 105 | 114 | 161 | 168 | 212 | 155 | 161 | 212 | 161 | 212 |
| 150 | 112 | 123 | 172 | 180 | 228 | 166 | 172 | 228 | 172 | 228 |
| 160 | 120 | 131 | 184 | 192 | 243 | 178 | 184 | 243 | 184 | 243 |
| 170 | 128 | 139 | 196 | 204 | 258 | 188 | 196 | 258 | 196 | 258 |
| 180 | 135 | 148 | 207 | 216 | 274 | 200 | 207 | 274 | 207 | 274 |
| 190 | 142 | 156 | 218 | 228 | 288 | 210 | 218 | 288 | 218 | 288 |
| 200 | 150 | 164 | 230 | 240 | 304 | 222 | 230 | 304 | 230 | 304 |

**USEFUL LOAD WEIGHTS AND MOMENTS
BAGGAGE AND CARGO**

| WEIGHT | BAGGAGE | | | CARGO | |
|--------|-----------------------------|--|---|--|---|
| | NOSE COMPT ARM 15 | BEHIND CENTER SEATS ARM 160 | AFT COMPT F.S. 170 TO 190 ARM 180 | FORWARD OF SPAR (CENTER SEATS REMOVED) | AFT OF SPAR (CENTER & AFT SEATS REMOVED) |
| | | | | ARM 108 | ARM 145 |
| | | | | MOMENT/100 | |
| 10 | 2 | 16 | 18 | 11 | 15 |
| 20 | 3 | 30 | 36 | 22 | 29 |
| 30 | 5 | 45 | 54 | 32 | 44 |
| 40 | 6 | 60 | 72 | 43 | 58 |
| 50 | 8 | 75 | 90 | 54 | 73 |
| 60 | 9 | 90 | 108 | 65 | 87 |
| 70 | 11 | 106 | 126 | 76 | 102 |
| 80 | 12 | 120 | 144 | 86 | 116 |
| 90 | 14 | 136 | 162 | 97 | 131 |
| 100 | 15 | 160 | 180 | 108 | 145 |
| 110 | 17 | 165 | 198 | 119 | 160 |
| 120 | 18 | 180 | 216 | 130 | 174 |
| 130 | 20 | 195 | | 140 | 189 |
| 140 | 21 | 210 | | 151 | 203 |
| 150 | 23 | 225 | | 162 | 218 |
| 160 | 24 | 240 | | 173 | 232 |
| 170 | 26 | 255 | | 184 | 247 |
| 180 | 27 | 270 | | 194 | 261 |
| 190 | 29 | 285 | | 205 | 276 |
| 200 | 30 | 300 | | 216 | 290 |
| 210 | 32 | 316 | | | 306 |
| 220 | 33 | 330 | | | 319 |
| 230 | 35 | 346 | | | 334 |
| 240 | 37 | 360 | | | 348 |
| 250 | 38 | 375 | | | 363 |
| 300 | 45 | 450 | | | 435 |
| 350 | | 525 | | | 508 |
| 400 | | 600 | | | 580 |

USEFUL LOAD WEIGHTS AND MOMENTS
USABLE FUEL

| GALLONS | WEIGHT | 166 GAL SYSTEM | 190 GAL SYSTEM |
|---------|--------|-------------------|-------------------|
| | | MOM/100 | |
| 10 | 60 | 46 | 46 |
| 20 | 120 | 92 | 92 |
| 30 | 180 | 140 | 140 |
| 40 | 240 | 189 | 189 |
| 50 | 300 | 238 | 238 |
| 60 | 360 | 288 | 288 |
| 70 | 420 | 338 | 338 |
| 80 | 480 | 388 | 388 |
| 90 | 540 | 439 | 439 |
| 100 | 600 | 489 | 489 |
| 110 | 660 | 539 | 539 |
| 120 | 720 | 590 | 590 |
| 130 | 780 | 641 | 641 |
| 140 | 840 | 692 | 692 |
| 150 | 900 | 743 | 743 |
| 160 | 960 | 793 | 793 |
| 166 | 996 | 824 | 824 |
| 170 | 1020 | | 845 |
| 180 | 1080 | | 899 |
| 190 | 1140 | | 953 |

SECTION VII

SYSTEMS DESCRIPTION

TABLE OF CONTENTS

| <i>SUBJECT</i> | <i>PAGE</i> |
|--|-------------|
| Airframe..... | 7-5 |
| Seating Arrangements..... | 7-5 |
| Flight Controls..... | 7-5 |
| Control Surfaces..... | 7-5 |
| Control Column..... | 7-5 |
| Rudder Pedals..... | 7-6 |
| Trim Controls..... | 7-6 |
| Electric Elevator Trim..... | 7-6 |
| Instrument Panel..... | 7-7 |
| Flight Instruments..... | 7-7 |
| Engine Instrumentation..... | 7-7 |
| Illustration..... | 7-8, 7-9 |
| Ground Control..... | 7-7 |
| Wing Flaps..... | 7-10 |
| Landing Gear System..... | 7-10 |
| Control Switch..... | 7-10 |
| Position Indicators..... | 7-10 |
| Safety Switch..... | 7-11 |
| Warning Horn..... | 7-11 |
| Manual Extension..... | 7-12 |
| Brakes..... | 7-12 |
| Baggage Compartments..... | 7-13 |
| Aft Baggage Compartment..... | 7-13 |
| Nose Baggage Compartment..... | 7-13 |
| Seating..... | 7-14 |
| Seat Belts and Shoulder Harnesses..... | 7-14 |

TABLE OF CONTENTS (Continued)

| <i>SUBJECT</i> | <i>PAGE</i> |
|--|-------------|
| Doors, Windows, and Exits..... | 7-15 |
| Forward Cabin Door..... | 7-15 |
| Aft Cabin Door..... | 7-17 |
| Control Locks..... | 7-18 |
| Engines..... | 7-19 |
| Engine Controls..... | 7-19 |
| Propeller, Throttle, and Mixture..... | 7-19 |
| Induction Air..... | 7-20 |
| Engine Ice Protection..... | 7-20 |
| Engine Lubrication..... | 7-21 |
| Cowl Flaps..... | 7-21 |
| Turbrocharger..... | 7-21 |
| Illustration..... | 7-22 |
| Waste Gate and Exhaust Bypass..... | 7-23 |
| Variable Absolute Pressure Controller..... | 7-23 |
| Operational Characteristics..... | 7-24 |
| RPM Effect on Manifold Pressure..... | 7-24 |
| Airspeed Effect on Manifold Pressure..... | 7-24 |
| Engine Response at High Altitude..... | 7-25 |
| Overboost Control..... | 7-25 |
| Propellers..... | 7-25 |
| Propeller Synchronizer..... | 7-26 |
| Propeller Synchroscope..... | 7-27 |
| Fuel System..... | 7-27 |
| Fuel Cells..... | 7-27 |
| Schematics..... | 7-28, 7-29 |
| Fuel Quantity Indicators..... | 7-30 |
| Fuel Crossfeed..... | 7-30 |
| Fuel Boost Pumps..... | 7-31 |
| Fuel Off-loading..... | 7-31 |
| Fuel Required for Flight..... | 7-31 |

TABLE OF CONTENTS (Continued)

| <i>SUBJECT</i> | <i>PAGE</i> |
|--|-------------|
| Electrical System..... | 7-32 |
| Battery..... | 7-32 |
| Alternators | 7-32 |
| Schematic | 7-33 |
| Starters..... | 7-34 |
| Alternate Battery Bus | 7-34 |
| External Power | 7-35 |
| Lighting Systems..... | 7-36 |
| Interior Lighting | 7-36 |
| Exterior Lighting..... | 7-36 |
| Environmental System | 7-37 |
| Pressurization | 7-37 |
| Description | 7-37 |
| Controller | 7-38 |
| Cabin Altitude Warning System | 7-39 |
| Heating..... | 7-40 |
| Schematic..... | 7-41 |
| Cooling | 7-42 |
| Ventilation | 7-42 |
| Oxygen System | 7-43 |
| Pitot and Static System | 7-44 |
| Heated Pitot..... | 7-44 |
| Instrument Static Air..... | 7-44 |
| Illustration | 7-45 |
| Static Drain | 7-46 |
| Instrument Pressure System..... | 7-46 |
| Stall Warning..... | 7-46 |
| Ice Protection Systems | 7-47 |
| Surface Deice | 7-47 |
| Windshield Anti-Ice (Electrothermal) | 7-48 |
| Windshield Anti-Ice (Fluid Flow) | 7-49 |
| Electrothermal Propeller Deice | 7-49 |
| Pitot Heat | 7-50 |
| Stall Warning Anti-Ice..... | 7-50 |
| Heated Fuel Vents | 7-50 |

INTENTIONALLY LEFT BLANK

AIRFRAME

The BEECHCRAFT Baron 58P is an all-metal, low-wing, twin-engine airplane with retractable tricycle landing gear and a conventional horizontal and vertical stabilizer.

SEATING ARRANGEMENTS

The Baron 58P is a four- to six-place airplane. In the standard configuration, four forward facing seats are installed. A fifth and sixth forward facing seat are optional.

In the optional club seating configuration, the third and fourth seats are aft facing and the fifth and sixth are forward facing.

FLIGHT CONTROLS

CONTROL SURFACES

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

CONTROL COLUMN

The throw-over type control column for elevator and aileron control can be placed in front of either the pilot's or copilot's seat. Pull the T-handle latch at the base of the control arm and position the control column as desired.

RUDDER PEDALS

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

TRIM CONTROLS

Trim tabs on the rudder, left aileron, and elevator are adjustable with the controls mounted on the center console through closed cable systems. Mechanical position indicators for each of the trim tabs are integrated with their respective controls. The left aileron tab incorporates servo action in addition to its trimming purpose. Elevator trim is accomplished through either the electric or the manual pitch trim system.

ELECTRIC ELEVATOR TRIM

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

Incorporated in the system is an emergency release button located on the left handle grip of the pilot's control wheel. This button can be depressed to deactivate the system quickly in case of a malfunction in the system. The system will remain deactivated only while the release button is being held in the depressed position.

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 gyro pressure. A magnetic compass is mounted above the instrument panel and an outside air temperature indicator is located on the left side panel. The clock is mounted in the center of the pilot's control wheel.

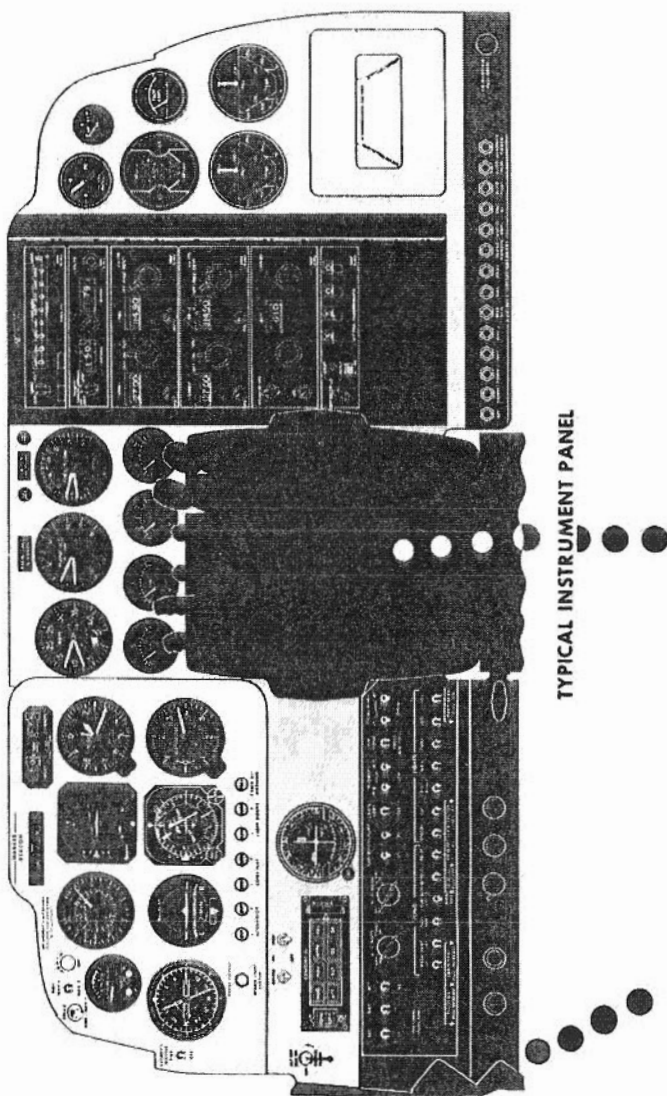
ENGINE INSTRUMENTATION

Most of the engine instruments are located in the upper center of the instrument panel. The standard grouping is the dual tachometer, dual manifold pressure, and dual fuel flow indicator. The left and right multiple readout indicator for oil pressure, oil temperature, and cylinder head temperature is located on the right panel. The left and right loadmeters, and the left and right fuel quantity indicators are located in the center panel. The turbine inlet temperature (TIT) indicator is located on the right panel.

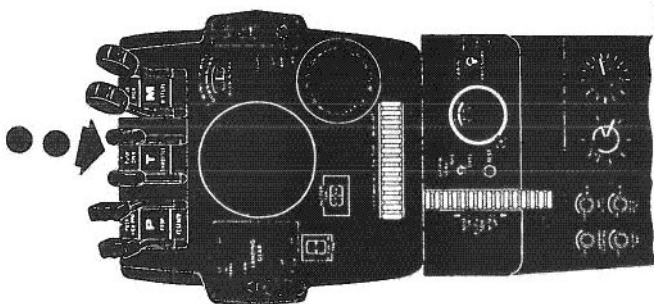
GROUND CONTROL

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. Sharper turns require light brake pedal pressure on the depressed rudder.

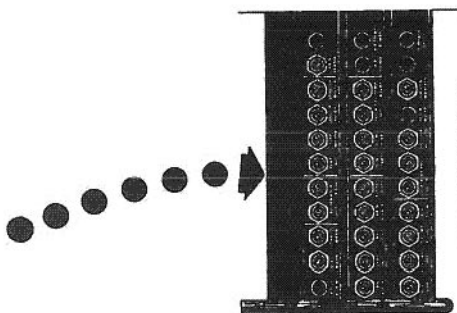
The minimum wing tip turning radius, using partial braking action and differential power, is 30 feet.



TYPICAL INSTRUMENT PANEL



CONTROL CONSOLE AND PEDESTAL



LEFT SIDE PANEL



FUEL SELECTOR

SEP-322-9

WING FLAPS

The wing flaps have three positions; UP (0°), APPROACH (15°), and DOWN (30°), with no intermediate positions. A flap position indicator and a control switch are located on the right side of the control console. The switch must be pulled out of a detent to change the flap position as required. The flaps will move to any position selected from any previously selected position.

Lowering the flaps in flight will produce the following effects:

| | | |
|-------------|---|-----------|
| Attitude | — | Nose Down |
| Airspeed | — | Reduced |
| Stall Speed | — | Lowered |

When the flaps are in the full down position, the landing gear warning horn will sound (regardless of throttle position) if the landing gear is not down and locked.

LANDING GEAR SYSTEM

CONTROL SWITCH

The landing gear is controlled by a two-position switch on the left 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.

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 out when the gears are up and locked. Pressing the press-to-test button on the instrument panel will verify the landing gear lamp bulbs are illuminating. The intensity of the lamps are automatically lowered for night flights when the navigation lights are turned on. If the navigation lights are being used during the daytime, the landing gear position lights may not be visible. In this case, momentarily turn off the navigation lights to provide for better illumination of the position indicator lights.

SAFETY SWITCH

A safety switch incorporated in the left main gear strut prevents inadvertent retraction of the landing gear. When the strut is compressed, the control circuit is open and the gear cannot retract. However, maneuvering over rough ground may allow the gear strut to extend momentarily, closing the circuit long enough to begin retraction. **NEVER RELY ON THE SAFETY SWITCH TO KEEP THE GEAR DOWN DURING GROUND MANEUVERING. CHECK TO SEE THAT THE LANDING GEAR SWITCH IS DOWN.**

WARNING HORN

If either or both throttles are retarded below an engine setting sufficient to sustain flight with the landing gear retracted, a warning horn will sound intermittently. Also, when the flaps are in the full down position, the warning horn will sound regardless of the throttle position if the landing gear is not down and locked.

MANUAL EXTENSION

The landing gear can be manually extended, but not retracted, by operating the handcrank at the rear of the pilot's seat. Make certain that the landing gear handle is in the down position and pull the landing gear MOTOR circuit breaker 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 airplane is on the ground and the malfunction has been determined and corrected, 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 each toe pedal until firm. Push the control in to release the brakes.

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. Linings should be replaced when .250 inch is measured between the brake housing and the brake lining.

BAGGAGE COMPARTMENTS

AFT BAGGAGE COMPARTMENT

The aft baggage compartment is accessible through the cabin door on the left 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 sub-compartments, each having a different weight limitation. Loading within the baggage compartment must be in accordance with the data in the WEIGHT AND BALANCE section. All baggage must be secured with the nylon net, which is provided for each compartment.

WARNING

Do not carry hazardous material anywhere in the airplane.

NOSE BAGGAGE COMPARTMENT

The forward baggage 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 compartment incorporates the full width of the fuselage as usable space. This compartment affords ac-

cessibility to some of the airplane's avionics, as well as a convenient storage area for the larger, heavier items. Straps are provided and should be used to secure any baggage or cargo loaded into the nose baggage 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 compartment.

Club seating is available. When occupied, aft facing chairs in the club seating arrangement must have the headrests in the fully raised position during takeoff and landing. If desired, these seats can be arranged to face forward. To convert aft facing club seats to forward facing, move seat stops on center tracks to the two forward existing holes. Move stops on outboard and inboard tracks to the existing aft holes.

SEAT BELTS AND SHOULDER HARNESSSES

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.

Each strap is worn over the shoulder and down across the body, where it is fastened by metal loops 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 Pressurized Baron is equipped with a fail-safe cabin door latching mechanism. When the door latch hooks are in position, a spring loaded secondary locking device main-

tains a safety locked condition. In addition, a pressure lock prevents inadvertent movement of either the secondary system or the door handle itself when pressurized. When the door is 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, rotate the safety release knob counterclockwise and lift the handle from its recess and turn it clockwise until the door opens. Return the handle so as to be in line with the recess and release. The door will swing out and forward over the wing. A door stay rod will pop into a receptacle to hold the door in the open position. The door may be closed from the outside by rotating the handle counterclockwise until the safety release knob locks in a streamlined position. Upon locking, return the handle so as to be in line with the recess and release. Two of the seven latch hooks activate two switches mounted in the door frame. A forward cabin door warning light on the annunciator panel illuminates when the cabin door is not secure. All door switches must be activated to turn off the annunciator light. In addition, a visual check will be made of each hook for engagement.

To close the door from the inside, first observe that the door handle is in the up position. Then grasp the door strap and

firmly pull the door closed. Rotate the handle down (clockwise) until the safety lock is engaged.

To open the door from the inside, turn the safety lock knob clockwise and, at the same time, rotate the door handle counterclockwise.

■ FORWARD CABIN DOOR SEAL

The forward cabin door seal is inflated by an electric air pump controlled by a two-position switch on the central pedestal, placarded DOOR SEAL-INFL-DEFL, which is normally in the INFL position. A door seal safety switch on the door frame de-energizes the system and prevents inflation of the door seal with the door open even if the switch is in the INFL position. An air pressure tank, between the door seal control valve and the door seal, provides an additional volume of air to reduce the cycling of the door seal pressure system. The electric pump and pressure tank are located below the nose baggage compartment floor. With the control switch in INFL, the electric pump supplies air to the air pressure tank and seal until the electrical contacts of the door seal control pressure switch open and de-energizes the electric pump. The electric pump is energized when air pressure in the system is too low. With the control switch in DEFL, two solenoid valves are energized to depressurize the door seal and pressure tank. If the seal does not deflate with switch in DEFL, an **EMERGENCY DOOR SEAL DEFLATE** valve on the forward cabin door upholstery panel or copilot's subpanel can be actuated and held approximately 4 seconds to depressurize the seal. The door seal pressure system should normally be deflated prior to opening the door.

NOTE

The door seal pressure system may cycle a couple of times because of ambient pressure fluctuation affecting the system during cruise or descent.

A blue annunciator low pressure light, on the center panel above the engine instruments, is used with the normal and standby door seal air pressure system. The light comes on whenever the door seal pressure system is below the proper setting, battery switch on, and door seal control switch in INFL. The low pressure light will not come on if there is a complete electrical failure. In that event, door seal pressure is monitored by listening for noise of air leaking around door seal and checking loss of cabin pressurization as indicated on the cabin altitude gage.

NOTE

The emergency door seal standby system is not intended to replace the normal door seal system for long periods of time. It should be used only to supply the door seal until the airplane can descend to an unpressurized flight altitude level.

The door seal standby system provides an alternate air source to the door seal when the electric pump or pump electrical circuit fails. A manually operated air valve, placarded DOOR SEAL STANDBY SYSTEM-PULL UP FOR ON, is located on the left subpanel. With the valve in the ON(up) position, the alternate air supply is routed from the engine driven air pumps to the door seal air pressure system. A momentary DOOR SEAL STANDBY switch on the pilot's left subpanel, when held in the on position, energizes the

two-stage solenoid valves in the engine nacelle. The dry air pumps supply the air pressure to the door seal control valve which regulates the standby air pressure to inflate the door seal. The momentary switch must not be held in the on position longer than 5 seconds with a 5 minute interval between actuations.

AFT CABIN DOOR

The aft cabin door is equipped with a fail-safe latching mechanism. When the door latch pins are in position, a slotted link and spring loaded detent pin maintain a safety locked condition. In addition, a pressure lock prevents inadvertent movement of either the secondary system or the door handle itself when pressurized. When the door is 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, push the safety release button and lift the handle from its recess and turn it clockwise until the door opens. Return the handle so as to be in line with the recess and release. The door will swing out and forward over the wing. An "overcenter" stay brace holds the door in the fully open position. The door may be closed from the outside by rotating the handle counterclockwise until the release button pops outward. Upon locking, return

the handle so as to be in line with the recess and release. Three of the four latch pins activate three switches mounted in the door frame. An aft cabin door warning light on the annunciator panel illuminates when the cabin door is not secure. All door switches must be activated to turn off the annunciator light. In addition, a visual check will be made of each latch pin for engagement.

To close the door from the inside, first observe that the door handle is in the up position. Then grasp the door strap and firmly pull the door closed. Rotate the handle down (clockwise) until the safety lock bolt pops into place. The word LATCHED should be visible through the view window.

To open the door from the inside, pull in on the red safety lock button and at the same time, rotate the door handle counterclockwise.

The aft cabin door is equipped with a resilient hollow seal, cushioned by filler material that holds it in the proper contour against the edge of the door. The seal is mounted on the door frame and, when the cabin is pressurized, is forced outward by cabin pressure to form a tight seal against the door.

CONTROL LOCKS

The control column pin assembly is placarded with the installation instructions. The placard reads:

On side facing pilot with locks properly installed:

CONTROLS LOCKED
REMOVE BEFORE
FLIGHT

On instruction side:

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.**

ENGINES

The Baron 58P is powered by two Continental TSIO-520-L or TSIO-520-LB six-cylinder, horizontally opposed, fuel injected engines rated at 310 horsepower each at 2700 rpm and 38 in. Hg, and are turbocharged for improved high altitude performance.

ENGINE CONTROLS

PROPELLER, THROTTLE, AND MIXTURE

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

INDUCTION AIR

Induction air is available from two sources, filtered ram air or automatic alternate air. Filtered ram air enters from a flush inlet air scoop on the left side of each cowl. Should the filter become obstructed, a spring-loaded door on the firewall will open automatically and the induction system will operate on alternate air taken from a louvered opening on the left side of the nacelle. Above critical altitude, on alternate air, a drop in manifold pressure will be noted. Below critical altitude, no change of manifold pressure will be indicated. If the manifold pressure drops, it may be regained by advancing the throttles. The mixture should be readjusted after resetting the power.

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.

The possibility of induction system icing is reduced by the non-icing characteristics of the turbocharged engines, flush induction air intakes, and the automatic alternate air source. The only significant ice accumulation is impact ice on the flush scoop and filter.

Should the induction air scoop or filter become clogged with ice, a spring-loaded door on the firewall will open automatically, and the induction system will operate on alternate air. When operating on alternate air above the critical altitude, a reduction of manifold pressure will be noted.

ENGINE LUBRICATION

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 cowling. A calibrated dip stick attached 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.

NOTE

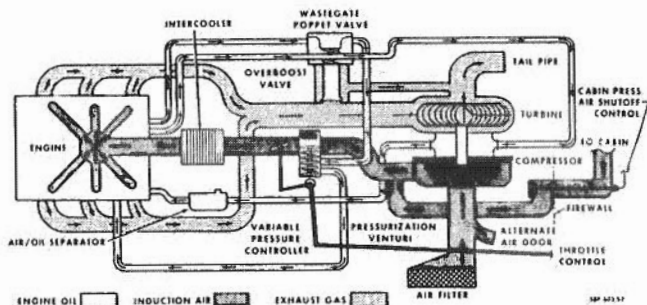
The turbocharged engines are to be operated with oil conforming to Teledyne Continental Motors Corporation Specification MHS-24A.

COWL FLAPS

The cowl flap of each engine is controlled by separate switches on the left subpanel. Each switch has three positions, placarded: CLOSED — OFF — OPEN. The switch allows the cowl flap to be stopped in any position so that the cylinder head temperature can be regulated.

TURBOCHARGER

The turbocharger consists of two separate components: a compressor and a turbine connected by a common shaft.



The compressor supplies pressurized air to the engines for high altitude operation, and to the cabin for pressurization. The compressor and its housing are located between the ambient air intake and the induction air manifold. The turbine and its housing are part of the exhaust system and utilize the flow of exhaust gases to drive the compressor.

During cruise, with the engines leaned, the maximum allowable exhaust gas temperature is 1650°F and the turbine is turning between 60,000 and 90,000 revolutions per minute. During operation, the center housing is supplied with engine oil which both lubricates and cools the bearings. When the engine stops rotating, this supply of lubrication and cooling also stops. When the engine is stopped, it is possible for the turbine wheel to continue rotation for a period up to two minutes without continued lubrication. If by chance oil does remain in the center housing at this time, the higher temperatures tend to cause the oil to coke. The residue remaining from this coking process is destructive to the turbo seals and causes early failure, requiring seal replacement.

Proper shutdown procedures play an important part in the continued safe operation of the turbocharged engines. The shutdown procedure in the NORMAL PROCEDURES

section, allows the turbine to stabilize at a temperature of approximately 600°F and also allows the turbine to slow down considerably.

WASTE GATE AND EXHAUST BYPASS

The waste gate actuator, operated by engine oil pressure, activates a waste gate valve located in the turbine housing. Oil pressure closes the waste gate and all the exhaust gas is routed into the turbine side of the turbocharger, giving maximum compression to induction air. When the actuator opens the waste gate, a minimum of exhaust gas drives the turbocharger. The balance of the exhaust is dumped directly overboard. Thus, the waste gate position regulates the supercharger air available to the engine.

The following steps illustrate the operation of the system:

1. Induction air is taken in through the air filter and ducted to the compressor.
2. Induction air is compressed and ducted to the engine.
3. A portion of the compressed air is bled off for cabin pressurization.
4. As the waste gate opens, some of the exhaust gases are routed around the turbine, through the exhaust bypass and overboard.
5. When the waste gate is closed, all of the exhaust gases pass through and drive the turbine, which, in turn, drives the compressor.
6. The exhaust gases are dumped overboard.

VARIABLE ABSOLUTE PRESSURE CONTROLLER

The control center of the turbocharger system is the variable absolute pressure controller. This device simplifies tur-

bocharging to a single control — the throttle. Once the pilot has set the desired manifold pressure, virtually no throttle adjustment is required with changes in altitude. The controller senses manifold pressure requirements for various altitudes and regulates the oil pressure to adjust the waste gate. Thus, the turbocharger maintains only the manifold pressure called for by the throttle setting except for operation above the "critical altitude" or that altitude where the waste gate reaches the fully closed position.

OPERATIONAL CHARACTERISTICS

Aside from the absence of manifold pressure variation with altitude, there is little difference between the turbocharged and the unturbocharged engine when operated below the critical altitude. Above critical altitude, certain operational characteristics must be understood to fully realize the advantages and capabilities of this turbocharger engine combination. These are as follows:

RPM EFFECT ON MANIFOLD PRESSURE

Above the critical altitude, any change in rpm will result in a change in manifold pressure. A decrease in rpm will produce an increase in manifold pressure.

AIRSPEED EFFECT ON MANIFOLD PRESSURE

Above the critical altitude, an increase in airspeed will result in a corresponding increase in manifold pressure. This is true because the increase in ram air pressure from an increase in airspeed is magnified by the compressor resulting in an increase in manifold pressure. The increase in manifold pressure creates a higher mass flow through the engine,

causing higher turbine speeds and thus increasing manifold pressure. This characteristic may be used to best advantage by allowing the airplane to accelerate to cruise speed after leveling off and prior to reducing power.

ENGINE RESPONSE AT HIGH ALTITUDE

Large, sudden power reductions at altitude with rich mixtures can cause loss of engine power. These power reductions or increases should be made slowly with necessary mixture adjustments in a series of two or three steps.

OVERBOOST CONTROL

The engine incorporates a relief valve in the induction system which is set to relieve the manifold pressure at approximately 43.5 in. Hg. This valve will open only in the event of a malfunction in the variable absolute pressure control system.

To avoid exceeding normal manifold pressure limits, particularly in cold weather, the last 1½ inches of throttle travel should be applied slowly while observing manifold pressures. Momentary overboost to the limit of the relief valve (43.5 in. Hg) will have no detrimental effect on the engine, but is indicative of a malfunctioning variable absolute pressure controller. If overboost is more than momentary, or occurs when engine oil temperature is normal, the controller should be checked by an authorized facility.

PROPELLERS

The engines are equipped with 78 inch Hartzell, three-blade, full feathering, constant speed, air dome propellers. Centrifugal force from the propeller counterweights, assisted by

air pressure (and spring force, if the hubs are spring-equipped) in the propeller dome, moves the blades to high pitch. Engine oil under governor-boosted pressure moves the blades to low pitch. Propeller dome air pressure settings are listed in the **SERVICING** section.

The propellers should be cycled occasionally during high altitude flight and 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 is 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 obtaining complete manual synchronization of the propellers.

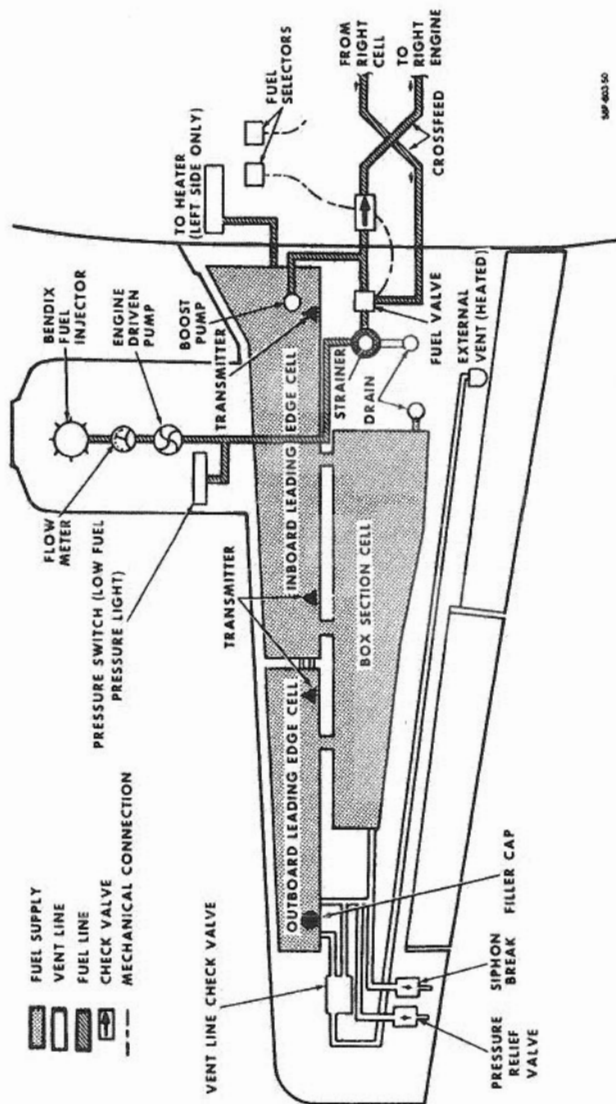
FUEL SYSTEM

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

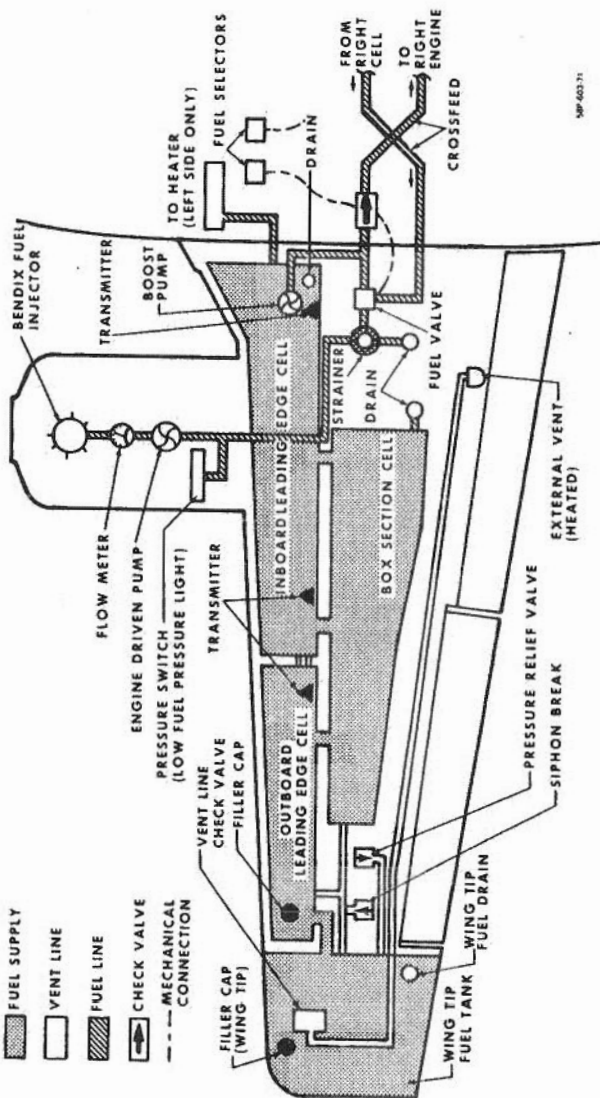
FUEL CELLS

The standard wing fuel system has a total capacity of 172 gallons. The optional wet wing tip tank system provides a total capacity of 196 gallons. Refer to the LIMITATIONS section for the usable fuel in each system.

The fuel cells in each wing are interconnected to make all of the usable fuel in each wing system available to its engine when the fuel selector is turned to ON. Each wing of the standard 172 gallon system is serviced through a single filler cap. The optional 196 gallon system has an additional filler cap in each wet wing tip tank. The fuel value placarded adjacent to each filler cap indicates fuel capacity and usable fuel when that wing fuel system is full. Refer to the SERVICING section for additional information.



172 GALLON FUEL SYSTEM SCHEMATIC



58P 603-71

196 GALLON FUEL SYSTEM SCHEMATIC

CAUTION

When the wet wing tip tanks are filled with fuel, DO NOT open the outboard wing leading edge filler caps, as fuel will exit from those openings.

The standard 172 gallon fuel system is drained at six locations. The optional 196 gallon fuel system is drained at eight locations.

FUEL QUANTITY INDICATORS

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

When the wet wing tip fuel system is installed, each fuel quantity indicator will read FULL until fuel quantity remaining in the respective wing is approximately 75 gallons. As the remaining fuel is used, each indicator will move, and indicate EMPTY when usable fuel is depleted.

FUEL CROSSFEED

The fuel lines for the engine are interconnected by crossfeed 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 all the available fuel from the opposite side.

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

FUEL BOOST PUMPS

Submerged, tank-mounted fuel boost pumps are provided for each engine and are located in the inboard leading edge tanks. They are controlled by separate ON-OFF toggle switches located on the pilot's subpanel and should be used for starting, takeoff, landing, and any time fuel flow fluctuations are noted. The fuel boost pumps provide for near maximum engine performance should the engine-driven pump fail. Left or right fuel boost pump failure is indicated by illumination of the respective LOW FUEL PRESSURE light on the panel.

FUEL OFF-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 you as the pilot are 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 takeoff. 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/start, and alternator switches are located on the pilot's subpanel. This panel contains most of the electrical system switches and switch type circuit breakers. Each is placarded as to its function. The remaining electrical equipment circuit breakers are located on the pilot's side panel. All avionics circuit breakers are located on the right subpanel.

BATTERY

Two 25 ampere hour, 12-volt lead acid batteries connected in series are standard. The battery installation is located beneath the floor of the nose baggage compartment. Battery servicing procedures are described in the **SERVICING** section.

ALTERNATORS

Two 50-ampere, 24-volt, gear-driven alternators are standard equipment.

The alternators are controlled by two fully transistorized electronic voltage regulators. The alternator systems are completely separate except for the mutual tie to the main battery bus. The regulators automatically maintain the bus voltage at a set value for all loads up to the alternator rating. The voltage regulators also maintain approximately equal load sharing between the two alternators.

Individual alternator output is indicated by two loadmeters (as opposed to the charge-discharge type ammeter) on the instrument panel. The loadmeters give a percentage reading

of the load on the system while an ammeter reading would increase or decrease in direct proportion to the electrical load applied.

Two warning lights placarded ALTERNATOR OUT-L-R, are located in the instrument panel. Any time either alternator voltage is 1.5 to 2.0 volts below the bus voltage, the light corresponding to the low voltage alternator will illuminate. If only one alternator is operating, the light corresponding to this alternator will illuminate when the alternator voltage is 1.5 to 2.0 volts below the bus voltage, or in this case, the battery voltage. The alternator out light will also illuminate when the over voltage relay is actuated. The overvoltage relay opens the affected alternator field, and the affected alternator voltage will drop to zero. When the battery is turned on with both alternators off, both alternator out lights will illuminate. The lamps can be tested by the PRESS TO TEST — WARN LIGHT SYSTEM located on the 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 subpanel. To energize the starter circuit, hold the magneto/start switch in the START position.

ALTERNATE BATTERY BUS

The optional alternate battery bus provides electrical power directly from the battery for any emergency situation requiring such action. Control of this system consists of one guarded switch mounted on the instrument panel.

In the event of a dual alternator failure and the alternate battery bus is required for use, the following items will be provided:

1. Electric Gyros (if installed)
2. Turn and Slip Indicator
3. Nav Lights
4. Instrument Lights
5. Cabin Lights
6. Left Landing Light
7. Audio
8. Com 1
9. Nav 1 (Nav 2 only, if installed)
10. Transponder

The standard battery installation will provide 30 minutes or more of operation, according to the number of the above loads used.

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 posts 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.

NOTE

If polarity is reversed, a diode in the coil circuit will prevent contactor operation.

LIGHTING SYSTEMS

INTERIOR LIGHTING

A courtesy step light will illuminate any time the forward door is in an unlocked position. The cabin dome light will illuminate whenever either the forward or aft cabin door is not locked. The cabin dome light can also be operated by a switch beside the light. The switches for the individual reading lights above the standard rear seats are located adjacent to the lights. Four rheostat switches are located on the pedestal below the elevator trim wheel. One switch adjusts the intensity of the individual instrument lights for the instruments directly above the pilot's subpanel. The second switch controls the intensity of the lighting for the radio panel, fuel selector panel, and trim tab indicators. The third switch controls the intensity of the instrument flood lights, mounted in the glareshield. The fourth switch controls the electroluminescent lighting in the pilot's subpanel. The magnetic compass light and the outside air temperature indicator light are controlled by a switch located on the pilot's control wheel.

EXTERIOR LIGHTING

The switches for the navigation lights and landing lights plus the switches for the rotating beacons, nose gear taxi light, and wing ice light are grouped along the top of the pilot's subpanel. The landing lights in the leading edge of each wing tip or on the front lower section of each engine cowling 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. The nose gear taxi light should be used 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 is not advisable under instrument or limited VFR conditions.

ENVIRONMENTAL SYSTEM

The environmental system consists of pressurization, heating and cooling systems, and their associated controls.

PRESSURIZATION

DESCRIPTION

The pressurization system consists of an altitude and rate controller, a test switch, a cabin pressure switch, a door seal switch, a cabin climb indicator, a combination differential pressure and cabin altitude indicator, and a cabin pressurized air shutoff control for each engine.

Pressurized air for the cabin is taken from the turbocharger compressor of each engine and reduced to a controlled flow by a restrictor in the line called a sonic nozzle. The air then passes through a firewall shutoff valve, through an intercooler and into the cabin beneath the pilot and copilot floorboards. The intercooler reduces the heat acquired by the air during pressurization with a flow of ram air from a scoop at the top of each engine nacelle. After the air enters the pressure vessel it is drawn into the conditioning plenums where it is either heated or cooled, according to the selected system, and distributed throughout the cabin. Located on the aft cabin bulkhead are two valves; the isobaric control valve and the safety valve. The controller pneumatically regulates the isobaric control valve to maintain the selected cabin altitude. The safety valve is connected to the cabin pressure switch, and to the landing gear safety switch. If

either of these switches is closed, the safety valve will open and the cabin will depressurize. The cabin pressurized air shutoff controls will stop the flow of pressurized air to the cabin when placed in the FULL CLOSED position.

CONTROLLER

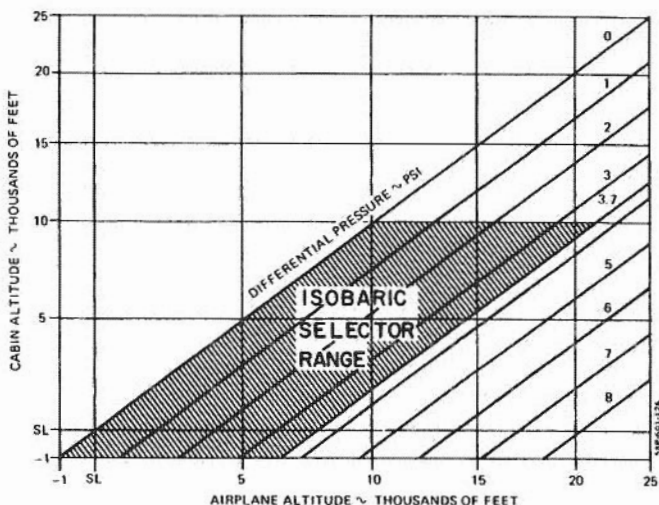
The controller contains a visual display of the selected altitude, an altitude selector, and a rate control. The altitude outer scale indicates the selected cabin altitude and the inner scale indicates the corresponding airplane altitude where the maximum differential pressure would occur. The rate control regulates the rate at which cabin pressure ascends or descends to the selected altitude. The pointer on the face of the knob set to the vertical position results in a rate of approximately 500 ft./min.

Before take-off, the altitude may be set either to the desired cabin altitude (outer scale) or to the planned cruising altitude plus 500 feet (inner scale). Before descent to landing, the outer scale should be set to the field elevation plus 500 feet. If the cabin differential pressure reaches the maximum and the airplane is still climbing, the cabin altitude will climb with the airplane altitude.

The graph provides information to determine the relationship between cruise altitude, cabin altitude and differential pressure. The zero differential pressure line indicates that the cruise altitude and the cabin altitude are identical (unpressurized). The 3.7 psi line indicates the maximum differential pressure obtainable in the cabin. To determine the lowest cabin altitude which can be maintained for a given cruise altitude: enter the graph at the desired cruise altitude and read up to the 3.7 psi differential pressure line; then read left to the altitude which can be maintained in the cabin. The

shaded area on the graph corresponds to the altitude selections obtainable on the controllers visual display window.

Cabin Altitude vs Airplane Altitude



CABIN ALTITUDE WARNING SYSTEM

The cabin altitude warning system consists of a warning light mounted on the instrument panel and a preset barometric pressure switch mounted in the left cabin sidewall, forward of the instrument panel.

The system is designed to function while the cabin is either pressurized or unpressurized. Any time the cabin altitude reaches 12,500 feet, the barometric pressure switch completes a circuit and illuminates the warning light, to warn of operation requiring oxygen. The use of oxygen is re-

commended to be in accordance with current FAA operating rules, or a descent should be made to a lower cabin altitude, if the cabin altitude is above 12,500 feet.

HEATING

A 35,000 btu's per hour combustion heater is located in the nose compartment and functions separately from the cooling system. The combustion heater operates in conjunction with a recirculation duct, vent blower, and combustion air blower.

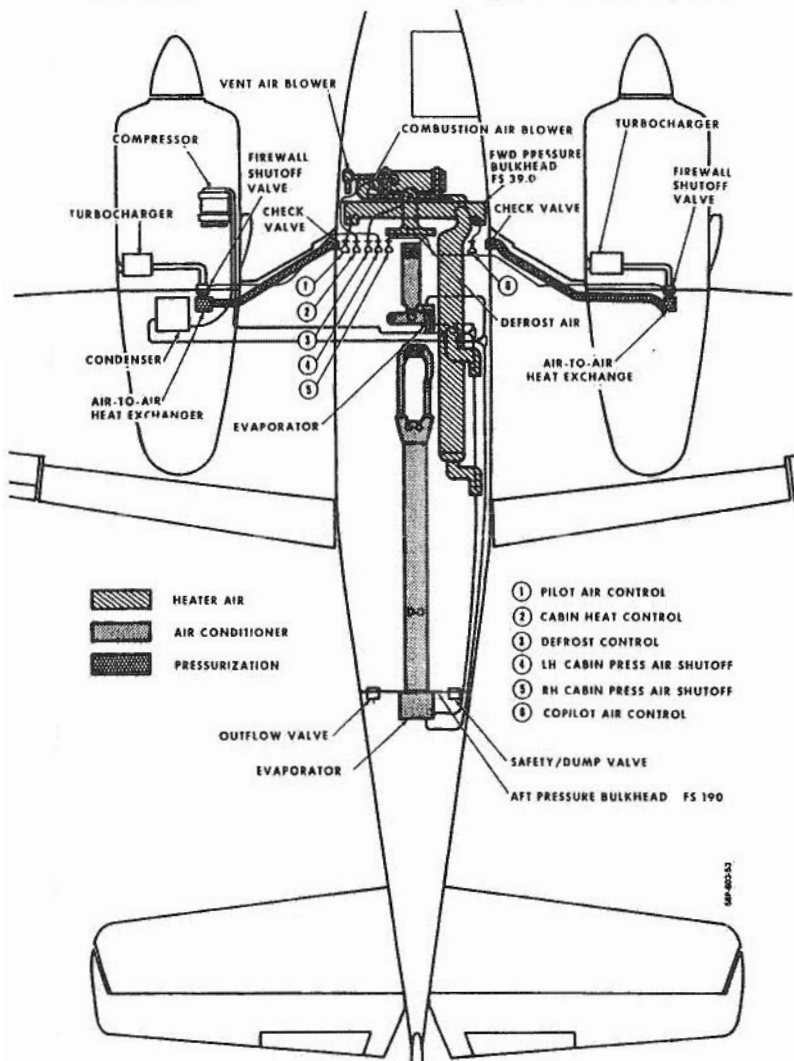
The CABIN HEAT switch, located on the pilot's subpanel energizes the fuel pump, heater ignition, combustion air blower, and LO vent blower. The HI mode of the vent blower can be selected with the adjacent blower switch if desired. Two thermo switches are installed as part of the heater assembly. A push-pull control on the lower left pilot's subpanel controls a variable thermo-switch (duct-stat) to obtain the desired cycling temperature. The cycling switch maintains a discharge temperature of 185°F in case of duct-stat malfunction.

To obtain maximum heater efficiency, the three position switch placarded AIR COND-PRESS AIR COOL should be placed in the center off position. In the off position, the nacelle doors are closed and will allow the temperature of the pressurized air entering the cabin to increase.

The manually resettable overtemp switch, located on the heater, shuts off the system until reset in case the discharge temperature reaches 300°F.

CAUTION

The entire system should be inspected and the malfunction determined and corrected before resetting the overtemp switch.



ENVIRONMENTAL SCHEMATIC

COOLING

The refrigerant 12 air conditioning system has a capacity of 14,000 btu's per hour and consists of forward and aft evaporator modules in the cabin, compressor in the left engine section, condenser and condenser blower in the left nacelle and a nacelle scoop door to introduce prop blast and ram air for condenser cooling.

Controls consist of three-position switches placarded AIR COND-PRESS AIR COOL with a center off position, and a blower switch placarded HI-OFF-LO. Both switches are located adjacent to each other on the pilot's subpanel. The evaporator blowers may be turned on independent of the air conditioning system to provide cabin air circulation when the air conditioning system is off.

When the air conditioning system is on during takeoff, the nacelle scoop door opens automatically to the mid-position or to the full open position when landing. The condenser blower is on any time the landing gear is extended and remains on for 5 minutes after landing gear retraction. The nacelle door is closed when the system is off.

The condenser and air-to-air heat exchanger are located in the left nacelle and only an air-to-air heat exchanger is located in the right nacelle. After the air passes through the condenser it is ducted overboard. One evaporator is recessed into the aft pressure bulkhead and distributes air to the cabin outlets. The forward evaporator is located under the front seats and distributes air to the pilot and co-pilot outlets. The forward evaporator blower can be controlled independently of the rear blower.

VENTILATION

Ventilation to the cabin is normally supplied by 4-5 lbs per minute of fresh air from each turbocharger. Ventilation from this source is adequate with one firewall air supply valve closed. If for any reason, both firewall valves are closed, the

Cabin Pressure switch should be placed in the DUMP (off) position to allow vent flow from the aft fuselage.

If smoke clearance is desired, in addition to the above, the door seal pressure should be dumped to allow more than normal ventilation air flow.

OXYGEN SYSTEM

WARNING

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

The recommended masks are provided with the system. The masks are designed to be easily adjustable to fit the average person comfortably, with minimum leakage of oxygen.

CAUTION

Make certain the masks fit properly. 90% of the system efficiency is determined by the fit of the oxygen mask.

Properly fitted, the 2.7 liters per minute masks are considered adequate for continuous use up to 22,000 feet. In case of depressurization, descent should be made to 22,000 feet or less within 30 minutes. Masks with a flow rate of 3.7 liters per minute are approved for continuous use to 30,000 feet and for therapeutic use. It is a general practice to have at least one 3.7 SLPM mask available for the aged or persons with anemia.

The system is equipped with a 15 cu ft oxygen cylinder and is available with either four, five, or six outlets and 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 non-compensating and provides a constant flow at all altitudes. The use of oxygen is recommended to be in accordance with current FAR operating rules.

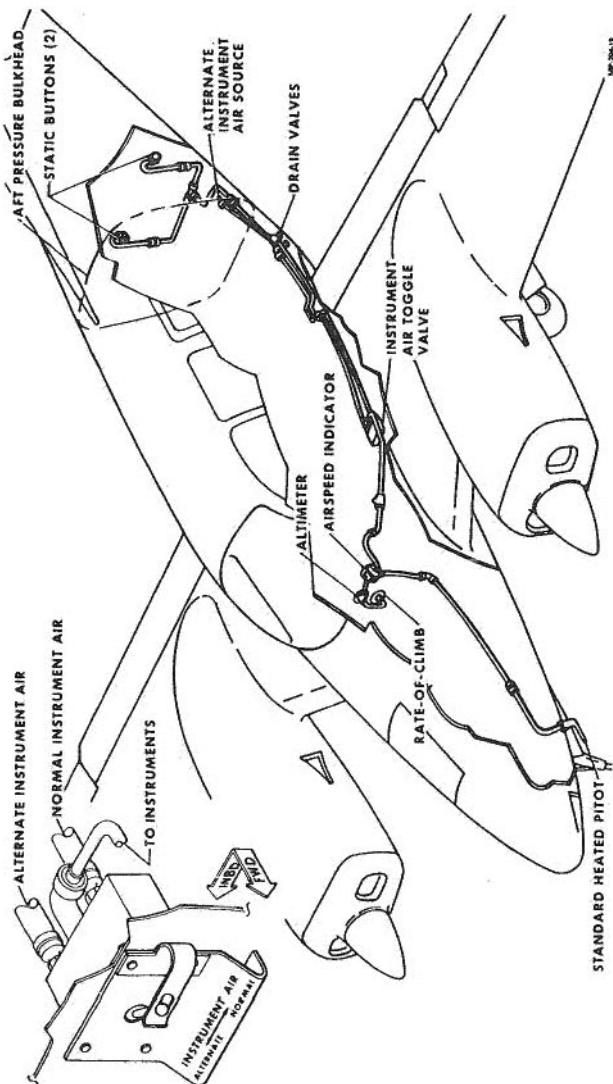
PITOT AND STATIC SYSTEM

HEATED PITOT

A standard pitot tube for the pilot's flight instruments is located immediately to the left of the nose gear doors. The optional pitot tube for the copilot's instruments is located to the right of the nose gear doors. Left and right pitot heat switches, supply heat to the left and right pitot masts respectively, and are located on the pilot's left subpanel.

INSTRUMENT STATIC AIR

The alternate instrument air source is designed to provide a source of static pressure to the instruments from inside the tail section just aft of the pressure bulkhead should the normal 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 guarded INSTRUMENT AIR toggle valve, located on the left forward side of the front spar cover is placarded, ALTERNATE-NORMAL. When it is required, select the ALTERNATE position. Refer to the Airspeed Calibration and Altimeter Correction graphs in the PERFORMANCE section.



STATIC DRAIN

The pitot system needs no drain because of the location of the components. Static air plumbing is drained through the drain valves located on the exterior, under the aft cabin door.

INSTRUMENT PRESSURE SYSTEM

Pressure for the flight instruments, and deice boots, 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 from carbon dust.

The pressure system also serves to create vacuum for the pressurization system by use of a small ejector. Vacuum is required for the pressurization controller and for dumping the safety valve.

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 equally effective at all

flight attitudes, weights, and airspeeds. The signal is irregular and intermittent at first, but 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 and base plate are provided with electric heating to aid in preventing ice from forming on the lift transducer. However, 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

CAUTION

Operation of the surface deice system in ambient temperatures below -40°C can cause permanent damage to the deice boots.

Deice boots cemented to the leading edges of the wings, horizontal tail surfaces, and vertical tail surface, are operated by engine-driven pump pressure. Compressed air, after passing through the pressure regulators, goes to the distributor manifold. When the deice system is not in operation, the deice valve applies vacuum to the boots to deflate and hold the boots flat against the surface. Then, when the deice system is operated, the deice valve changes from vacuum to pressure and 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 down MAN (manual) OFF position, and an up CYCLE position, controls the system. When the switch is in the CYCLE position, the deice boots inflate until a pre-determined pressure is reached, then deflate automatically and return to the vacuum hold down condition. The switch must be tripped for each complete cycle. The MAN OFF position is used if the boots will not deflate.

Deice boots are intended 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 $\frac{1}{2}$ to 1 inch of ice accumulates. Bridging can occur if boots are actuated too early or too frequently.

A wing ice light, used to check for ice accumulation during night operation, is located on the outboard side of the left nacelle. The light switch is on the pilot's subpanel.

WINDSHIELD ANTI-ICE (ELECTROTHERMAL)

The pilot's electrically heated windshield segment is controlled by a switch located on the left subpanel. Windshield heat is designed for continuous in flight use and should be applied prior to, or upon first encountering, icing conditions. This system is also beneficial as an aid in preventing frost and fogging due to rapid descents from higher altitudes into warm, moist air.

Operation of the windshield heat will cause the standby compass to become erratic; therefore, windshield heat should be turned off for a period of 15 seconds to allow a stable reading of the standby compass.

CAUTION

Ground use of windshield heat is limited to 10 minutes.

WINDSHIELD ANTI-ICE (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 windshield by wetting the windshield surface with anti-ice fluid. This system is controlled by a two position, ON-OFF circuit breaker switch, located on the pilot's subpanel. An indicator on the right side of the instrument panel indicates the amount of fluid in the supply tank.

ELECTROTHERMAL PROPELLER DEICE

Propeller ice removal is accomplished by the electrically heated deice boots bonded to each propeller blade. The system uses the airplane's electrical power to heat portions of the deice boots in a sequence controlled by a timer. The system is controlled by an ON-OFF circuit breaker switch on the pilot's subpanel. When the system is turned on, the ammeter will register 14 to 18 amperes. 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 nose. 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

On airplanes approved for flight in icing conditions, the mounting pad and the stall warning vane are equipped with a heating element that is activated anytime the switch on the pilot's subpanel, placarded STALL WARN is turned on.

Airplanes not approved for flight in icing conditions, the switch on the pilot's subpanel, placarded PITOT HEAT-LT, supplies power to the left heated pitot mast and to the heating plate and sensing vane of the stall warning device.

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.

SECTION VIII

HANDLING, SERVICING AND MAINTENANCE

TABLE OF CONTENTS

| <i>SUBJECT</i> | <i>PAGE</i> |
|---|-------------|
| Introduction to Servicing | 8-3 |
| Publications..... | 8-4 |
| Airplane Inspection Periods..... | 8-4 |
| Preventative Maintenance That May Be Accomplished | |
| By a Certificated Pilot | 8-5 |
| Alterations or Repairs to Airplane | 8-5 |
| GROUND HANDLING | 8-5 |
| Towing..... | 8-6 |
| Parking | 8-6 |
| Tie-Down | 8-7 |
| Main Wheel Jacking..... | 8-7 |
| Prolonged Out of Service Care | 8-8 |
| Flyable Storage — 7 to 30 Days | 8-8 |
| External Power..... | 8-10 |
| Recharging Battery Using Auxiliary Power | 8-11 |
| Checking Electrical Equipment | 8-11 |
| SERVICING..... | 8-12 |
| Fuel System..... | 8-12 |
| Cells | 8-12 |
| Drains..... | 8-13 |
| Strainers..... | 8-13 |
| Oil System | 8-14 |
| Battery | 8-15 |
| Tires..... | 8-15 |
| Shock Struts..... | 8-16 |
| Brakes..... | 8-18 |
| Induction Air Filters | 8-18 |

TABLE OF CONTENTS (Continued)

| <i>SUBJECT</i> | <i>PAGE</i> |
|---|-------------|
| Pressure Pump and Instrument Air Filters..... | 8-19 |
| Propellers | 8-19 |
| Propeller Dome Air Pressure Setting..... | 8-20 |
| Propeller Blade Bearing Lubrication | 8-20 |
| Windshield Anti-ice Tank (Fluid) | 8-21 |
| Oxygen System | 8-21 |
| Oxygen Cylinder Retesting..... | 8-21 |
| MINOR MAINTENANCE | 8-22 |
| Cabin Heater | 8-22 |
| Alternators | 8-22 |
| Magnetos..... | 8-23 |
| Cleaning | 8-23 |
| Exterior Painted Surfaces | 8-23 |
| Windshield and Windows..... | 8-24 |
| Surface Deice Boots..... | 8-25 |
| Engine | 8-25 |
| Interior..... | 8-25 |
| Lubrication Points..... | 8-28 |
| Recommended Servicing Schedule | 8-34 |
| Consumable Materials | 8-42 |
| Approved Engine Oils | 8-44 |
| Lamp Bulb Replacement Guide | 8-46 |
| Overhaul and Replacement Guide | 8-47 |

INTRODUCTION TO SERVICING

The purpose of this section is to outline the requirements for maintaining the Baron 58P 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 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.

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 a question should arise 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 side of the fuselage near the aft cabin door and is visible when the flaps are lowered.

PUBLICATIONS

The following publications are available through BEECHCRAFT 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 BEECHCRAFT Parts and Service Outlet or refer to BEECHCRAFT Service Instructions No. 0250-010, Revision III or subsequent revisions.

AIRPLANE INSPECTION PERIODS

1. FAA Required 100 Hour and/or Annual Inspections.
2. BEECHCRAFT Recommended Inspection Guide.
3. Continuing Care Inspection Guide.
4. See "Recommended Servicing Schedule" and "Overhaul or Replacement Schedule" for further inspection schedules.
5. 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 before performing preventative maintenance.
2. All other maintenance must be performed by licensed personnel.

NOTE

Pilots operating airplanes of other than U. S. registry should refer to the regulations of the 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 airplane to ensure that 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 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 with the 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 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 control 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 the control out and pump each toe pedal until solid resistance is felt. Push the control in to release the brakes.

NOTE

Excessive pedal pressure may prevent releasing of 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

Individual main wheels may be jacked by placing a floor jack under the jacking point located under each axle.

CAUTION

Prior to jacking the airplane, ensure that an unbalanced fuel condition does not exist. Fuel should be distributed evenly in both wings to prevent an unbalanced condition which could cause the airplane to be unstable while on jacks.

PROLONGED OUT OF SERVICE CARE

STORAGE

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

Flyable Storage — 7 to 30 Days — has been considered here. For more extended storage periods consult the Beech Airplane Maintenance Manual and Continental Service Bulletin M74-9 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 to 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.

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

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

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 engines 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. 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.

After a ground warm-up, drain engine oil and fill with Tele-dyne Continental Motors recommended oil before 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 external power unit to the positive terminal of the airplane's external power receptacle and the negative lead to the negative terminal of the external power receptacle. A positive voltage must also be applied to the small guide pin.

2. To prevent arcing, make certain no power is being supplied when the connection is made.
3. Make certain that the 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 BATTERY USING AUXILIARY POWER

1. Battery Switch — ON
2. Alternators, Electrical and Avionics Equipment — OFF
3. Connect auxiliary power unit.
4. Set the output of the auxiliary 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 airplane 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.

CAUTION

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

SERVICING

FUEL SYSTEM

FUEL CELLS

See Consumable Materials for recommended fuel grades. The standard fuel system has a total capacity of 172 gallons with a filler cap in each outboard wing leading edge. The optional fuel system has a total capacity of 196 gallons with a filler cap in each outboard wing leading edge and in each wet wing tip. Refer to the LIMITATIONS section for the usable fuel in each system.

NOTE

To obtain the maximum capacity of the fuel system when the wet wing tips are installed, fill the fuel system from the wet wing tip tank filler caps.

CAUTION

Caution must be taken when the wet wing tip tanks are filled with fuel. DO NOT open the outboard wing leading edge filler cap, as fuel will exit from that opening. If this occurs, wash the fuel from the wing surface to prevent possible paint damage.

Ground the airplane with a static line before refueling and secure the filler caps immediately after filling. Before leaving the airplane to 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.

NOTE

The optional 196 gallon fuel system should be filled from the outboard wing leading edge filler cap when airplane must stand for several days. Check and fill to capacity at wet wing tip filler cap before flight if required for the mission.

The fuel fillers are equipped with spring loaded anti-syphon valves which may restrict large fuel nozzles. Push the valve plate down carefully to fully insert filler nozzle.

FUEL DRAINS

Six snap-type fuel drains are provided to purge any water from the system. Two sump drains extend through the bottom of each wing. A fuel strainer in each wheel well is provided with a drain extending through the wheel well skin. In addition, a flush-type fuel drain is located on the lower surface of each wet wing tip (if installed). A wrench is provided in the loose tools and accessories for draining the wet wing tip tanks.

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.

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 cowling. A calibrated dipstick attached 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 and the oil filter should be changed every 50 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. Also, remove the lower oil line at the bottom of the turbocharger air/oil separator to completely drain the oil system (refer to Maintenance Manual).

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-24A.

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

BATTERY

Access to the lead acid battery is obtained by opening the forward baggage compartment door and removing the battery box cover in the floor of the compartment. Check the battery electrolyte level after each 25 hours of operation; maintain the electrolyte level to cover the plates by adding distilled battery water. 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 insure the disposal of these fumes the vent hose connections at the battery box should be checked frequently for obstructions.

TIRES

The main wheel tires are 19.5 × 6.75-8, 10 ply rated, tube type. The nose wheel tire is a 5 × 5.00, 6 ply, tube type.

Inflate the nose wheel tire to 47 to 50 psi, and the main wheel tires to 76 to 82 psi. If necessary to comply with runway landing restrictions, main gear tire inflation pressure may be reduced to 65 psi. Maintaining recommended tire inflation will help to avoid damage from landing shock and contact with sharp stones and ruts, and will minimize tread wear. When inflating tires, inspect them visually 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 nose gear shock struts. To service a strut, proceed as follows:

1. Remove the air valve cap and depress the valve core to release the air pressure.

WARNING

Do not unscrew the air valve assembly until all air pressure has been released or it may be blown off with considerable force, causing injury to personnel or property damage.

2. Remove the air valve 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 $4\frac{1}{16}$ to $4\frac{5}{16}$ 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. The shock strut piston must be clean. Remove foreign material by wiping the strut with a cloth containing hydraulic fluid.

CAUTION

If a compressed air bottle containing air under extremely high pressure is used, exercise care to avoid over-inflation of the strut.

WARNING

NEVER FILL SHOCK STRUTS WITH OXYGEN.

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 outward to compensate for lining wear. The brake linings should be replaced when .250 inch is measured between the brake housing and the brake lining.

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 service the filters:

1. Open left cowl door.
2. Remove left aft cowl panel and induction scoop.
3. Remove the filter and clean as noted by the manufacturer's instructions on the filter.
4. Reinstall the filter, panel, and the scoop.

PRESSURE PUMP AND INSTRUMENT AIR FILTERS

The filters should be inspected for foreign matter at least once during each 100-hour operating period. In adverse climatic conditions or if the airplane is stored, preflight inspection is recommended for the filter located on the rear baffle of the engine. If a decrease in normal pressure is noted on the pressure gage, the filters must be examined for possible blockage before adjustment is made to the pressure regulating valves.

PROPELLERS

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 the ignition switch is off and that the engine has cooled completely. **STAND IN THE CLEAR WHEN MOVING A PROPELLER. THERE IS ALWAYS SOME DANGER OF A CYLINDER FIRING WHEN A PROPELLER IS MOVED.**

PROPELLER DOME AIR PRESSURE SETTING

The propeller spinner dome air pressure should be checked for sufficient pressure each 100 hours as follows:

For PHC-J3YF-2F hub assemblies;

1. Remove the cap on the propeller spinner.
2. Connect a dry air or nitrogen supply line to the air valve and fill to 80 ± 2 psi. This should be done at 70°F.

NOTE

Increase 2 psi for every 10 degrees of temperature increase. Decrease 2 psi for every 10 degrees of temperature decrease.

For PHC-J3YF-2UF hub assemblies;

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.

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 left side panel.
2. Make certain that the oxygen control valve is closed (push in).
3. Remove the cap from the filler valve, and attach the recharging outlet.
4. Fill the cylinder to 1800 ± 50 psi (add 3.5 psi per degree above 70°F; subtract 3.5 psi per degree below 70°F).
5. Remove the recharging outlet, and replace the filler valve cap.

OXYGEN CYLINDER RETESTING

The oxygen cylinders, (light weight cylinders, stamped "3HT" on the plate on the side) must be hydrostatically tested every three years and the test data stamped on the cylinder. This cylinder has a service life of 4380 pressurizations or fifteen years, whichever occurs first, and then must be discarded.

MINOR MAINTENANCE

CABIN HEATER

The heater fuel pump is located under the nose baggage floorboard on the left side. The pump has a normal pressure of 7 psi.

Do not reset the over-temp switch until a thorough inspection of the system has determined the cause of the malfunction and the problem has been corrected.

The heater backfire trap filter should be vacuum cleaned at approximately every 25 hours of heater operation.

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 BEECHCRAFT 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

CAUTION

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

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.

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

WINDSHIELD AND WINDOWS

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

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

After thoroughly cleaning, the surface should be waxed with a good grade of commercial wax. The wax will fill in minor

scratches and help prevent further scratching. Apply a thin, even coat of wax and bring it to a high polish by rubbing lightly with a clean, dry, soft flannel cloth. Do not use a power buffer; the heat generated by the buffing pad may soften the plastic.

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

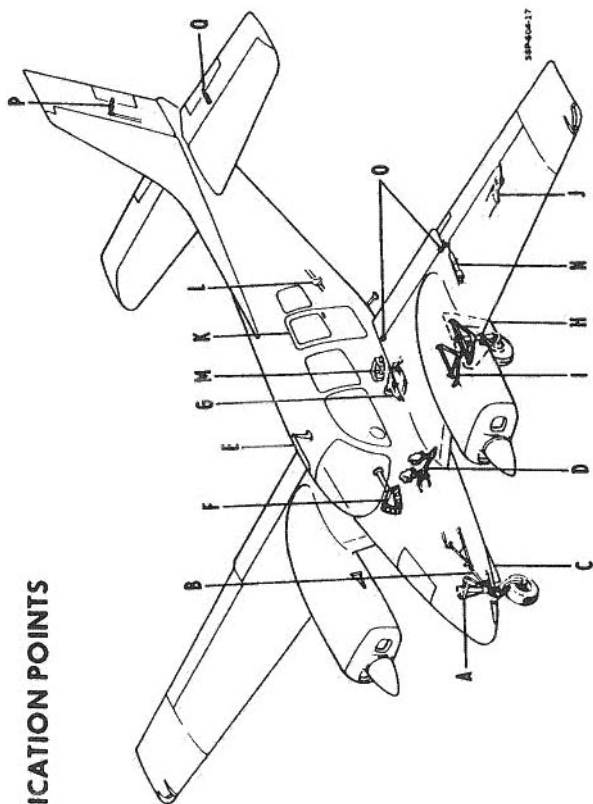
and hold it for several seconds. Continue blotting until no more liquid is taken up. Scrape off sticky materials with a dull knife, then spot-clean the area.

Oil 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.

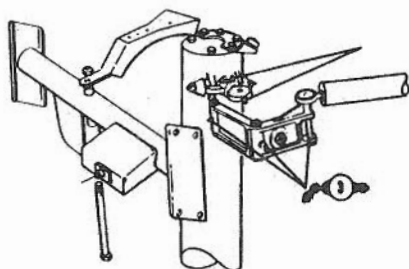
The plastic trim, instrument panels, and control knobs need only be wiped with a damp cloth. Oil and grease on these surfaces can be removed with a cloth moistened with isopropyl alcohol. Volatile solvents, such as gasoline, benzine, acetone, carbon tetrachloride, fire extinguisher fluid, anti-ice fluid, lacquer thinner, or glass cleaner should not be used. These materials will soften the plastic and may cause it to craze.

INTENTIONALLY LEFT BLANK



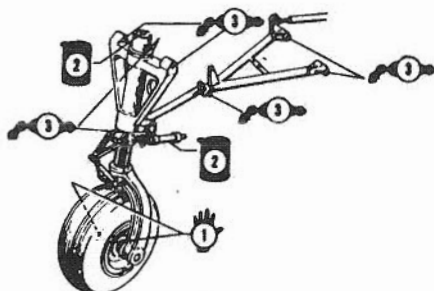
LUBRICATION POINTS

A



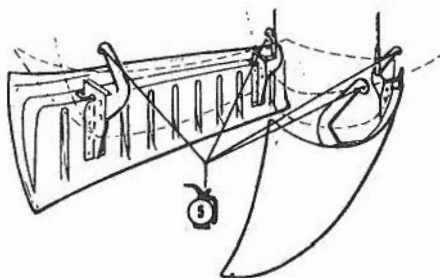
NOSE WHEEL STEERING

B



NOSE GEAR RETRACT

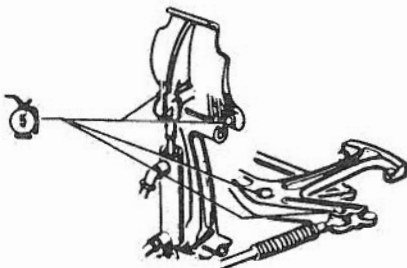
C



LANDING GEAR DOOR HINGES

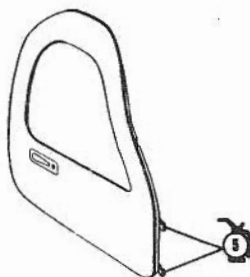
58P-604 18

D



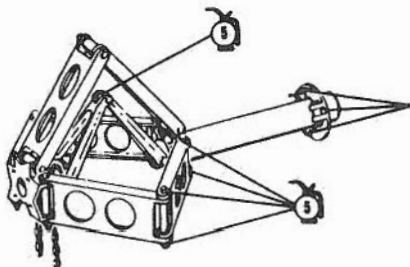
RUDDER PEDALS

E



FORWARD CABIN DOOR

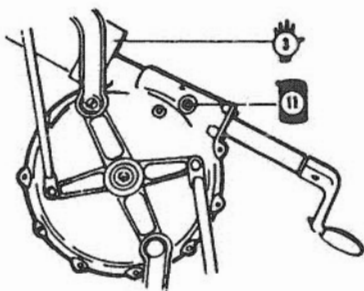
F



CONTROL COLUMN LINKAGE

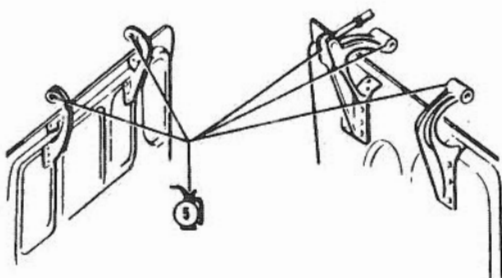
58P-604-19

G



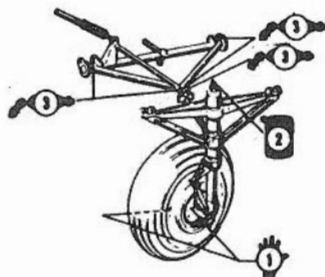
LANDING GEAR MANUAL EXTENSION

H



LANDING GEAR DOOR HINGES

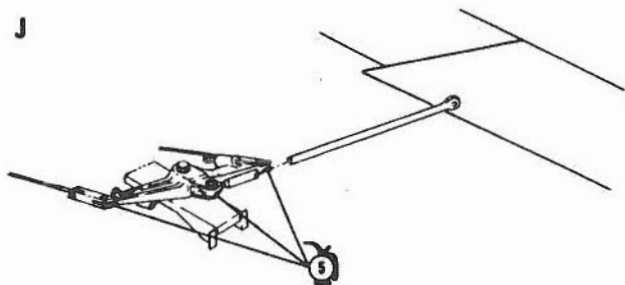
I



MAIN GEAR RETRACT

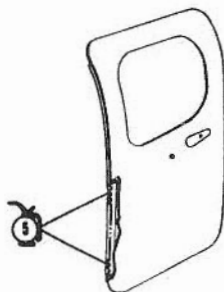
85P-604-20

J



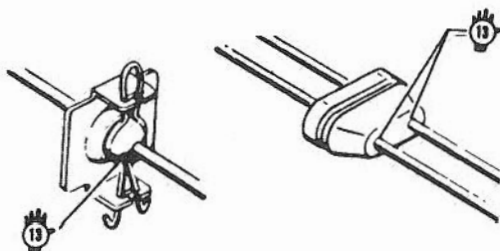
AILERON BELL CRANKS

K



AFT CABIN DOOR

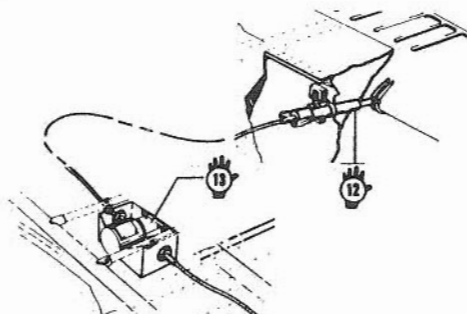
L



CABLE PRESSURE SEALS

33P404-21

M



FLAP MOTOR AND ACTUATOR



FLUID CONTAINER



ZERK FITTING



HAND OR PACK



SQUIRT CAN

Letters are keyed to the Service Schedule ; numbers refer to items in Consumable Materials.

58P-604-22

| RECOMMENDED SERVICING SCHEDULE | | | |
|--------------------------------|--|--|--|
| INTER- VAL | ITEM | LOCATION (Letters refer to Lubri- cation Points Diagram) | MATERIALS (Numbers refer to items in Consumable Materials) |
| 25 Hrs | Check Battery Electrolyte Level | Fwd baggage compartment under floor | Distilled water only |
| 50 Hrs | Clean Engine Induction Air Filter | Left side cowl door | (9) Clean per instructions on filter |
| | Change Engine Oil | Through cowl flap opening | (6) |
| | Replace Engine Oil Filter | Access through left cowl door | Refer to engine maintenance manual |
| | Lub Uplock Rollers | Each main landing gear (I) | (3) |
| | Inspect Main Landing Gear Downlocks | Each main landing gear (I) | |

| 100 Hrs | Clean Fuel Strainers | In wheel wells | Clean with solvent (9) and blow dry with compressed air |
|--|--------------------------|----------------|---|
| Calibrate TIT Gage | Engine compartment | AlCal unit | |
| Clean and Check Spark Plugs | Under cowl, both sides | — | |
| Check Magneto Timing | Engine compartment | — | |
| Lub Landing Gear | Landing gear wheel wells | (5) | |
| Door Hinges | (C) (H) | (3) | |
| Lub Nose Wheel | Nose wheel well (A) | | |
| Steering Mechanism | Nose wheel and main gear | (3) | |
| Lub Landing Gear | wheel wells (B) (I) | (1) | |
| Retract Mechanism | Landing gear (B) (I) | (2) | |
| Lub Wheel Bearings | Nose landing gear (B) | (2) | |
| Lub Nose Shock Strut | Main landing gear (I) | | |
| Lub Main Shock Struts | Top of each strut | | |
| Service Main and Nose Landing Gear Struts | | | Compressed air and hydraulic fluid (2) |

| RECOMMENDED SERVICING SCHEDULE | | | |
|--------------------------------|--|--|--|
| INTER-VAL | ITEM | LOCATION (Letters refer to Lubrica- tion Points Diagram) | MATERIALS (Numbers refer to items in Consumable Materials) |
| 100 Hrs (Cont.) | Lub Forward and Aft Cabin Door Mechanisms | Cabin doors (E) (K) (latches, hinges, and mechanisms) | (5) |
| | Lub Aileron Bell Crank | Access panel underside wings (J) | (5) |
| | Lub Control Column Linkage | Forward of instrument panel (F) | (5) |
| | Lub Rudder Pedals | Cockpit (D) | (5) |
| | Lub Propeller Blade Bearings | Propellers | (13) |
| | Check Propeller Air Dome | Access cap on propeller spinner | Dry air or nitrogen |
| | Check Propeller Accumu- lator | Lower rear of engine | Dry air or nitrogen (125 psi) |
| | Check Pressure System Inlet Air Filter | Forward side of aft engine baffle | Replace as necessary |

| | | | |
|---------------------|--|--|---|
| 100 Hrs (Cont'd) | Clean Servo Fuel Filter | Fuel control unit | Clean with solvent (9) and blow dry with compressed air |
| | Clean Aft Air Conditioner Return-air Filter | Aft of rear cabin upholstery panel | Back-blow with dry compressed air |
| | Clean Cabin Altitude Control Filter | Pedestal | Clean with solvent (9) and blow dry with compressed air |
| | Pressurization System Safety Valve Filter | Aft pressure bulkhead | Clean with solvent (9) and blow dry with compressed air |
| | Clean Static Air Buttons | Aft fuselage skin | Clean with solvent (9) and wipe dry with clean rag |
| | Drain Static Air Lines | Fuselage exterior, below aft cabin door | — |
| | Lub Rudder Trim Tab Hinge | Rudder (P) | (16) |
| | Lub Elevator Trim Tab Hinge | Elevator (Q) | (16) |
| | Lub Aileron Trim Tab Hinge | Aileron (N) | (16) |

| RECOMMENDED SERVICING SCHEDULE | | | |
|--------------------------------|--|--|--|
| INTER-VAL | ITEM | LOCATION (Letters refer to Lubrica- tion Points Diagram) | MATERIALS (Numbers refer to items in Consumable Materials) |
| 300 Hrs | Landing Gear Motor | Under floor, center of cabin (G) | (3) |
| | Reduction Gears | Under floor, center of cabin (G) | (11) |
| | Service Landing Gear Actuator Gearbox | Forward of flap underside of wing (M) | (12) |
| | Lub Flap Actuators | Under floor, in cabin (M) | (13) |
| 500 Hrs | Lub Flap Motor | | |
| | Reduction Gears | | |
| 500 Hrs | Replace Pressure System | Aft of engine firewall in | Airborne IJ4-7 P/N102-530025-9 |
| | Inline Air Filter | upper nacelle | |
| | Replace Aft Air Conditioner Return-air Filter | Aft of rear cabin upholstery panel | |

| | | | |
|--------|---------------------------------------|--|---|
| As Req | Service Windshield Anti-Ice Reservoir | Under left floorboard, forward baggage compartment | — |
| | Service Oxygen Cylinder | Aft fuselage | (19) |
| | Service Brake Fluid Reservoir | Nose baggage compartment | (2) |
| | Drain Moisture from Engine Oil Sump | Through cowl flap opening | — |
| | Service Shimmy Damper | Nose landing gear (B) | (2) |
| | Check Brake Lining Wear | Main landing gear wheels | — |
| | Air Conditioner Compressor Oil Level | See Maintenance Manual | Suniso No. 5 or Texaco Capella E, 500 Viscosity Oil |
| | Air Conditioner Refrigerant | See Maintenance Manual | Refrigerant No. 12 |
| | Lub Rudder Trim Tab Actuator | On rudder (P) | (12) |
| | Lub Elevator Trim Tab Actuator | On elevator (Q) | (12) |
| | Lub Aileron Trim Tab Actuator | On aileron (N) | (12) |

| RECOMMENDED SERVICING SCHEDULE | | | |
|---|--|--|--|
| INTER- VAL | ITEM | LOCATION (Letters refer to Lubrica- tion Points Diagram) | MATERIALS (Numbers refer to items in Consumable Materials) |
| †† | Emergency Locator Transmitter Battery | Right side of aft fuselage | — |
| Every 25 Hrs of Heater Operation | Clean Heater Backfire Filter Trap | Left side in nose compartment | Vacuum Clean |

NOTES: 1. Any time the control surfaces are altered, repaired, or repainted, they must be rebalanced per Maintenance Manual.

2. 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.

†† 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.

INTENTIONALLY LEFT BLANK

CONSUMABLE MATERIALS

| ITEM | MATERIAL | SPECIFICATION |
|-------|---|--|
| 1. | Lubricating Grease, High Temperature | MIL-G-3545 |
| 2. | Hydraulic Fluid | MIL-H-5606 or MIL-H-83282 |
| *3. | Lubricating Grease, General Purpose, Wide Temperature | MIL-G-81322 |
| 4. | Molybdenum Disulfide | MIL-M-7866 |
| 5. | Lubricating Oil | SAE 20 or 10W30 |
| **6. | Engine Oil | SAE 30 (Below 40°F) SAE 50 (Above 40°F) |
| ***7. | Engine Fuel | Grade 100 LL (Blue) Grade 100/130 (Green) |
| 8. | Anti-Ice Fluid | MIL-F-5566 |
| 9. | Solvent | Federal Specification, PD680 |
| 10. | Lubricant | Scintilla 10-86527 |
| 11. | Lubricant | Mobil Compound GG |
| 12. | Lubricating Oil, Gear | MIL-L-6086, Grade M |
| 13. | Lubricating Grease, Aircraft and Instruments, Gear and Actuator Screw | MIL-G-23827 |

**BEECHCRAFT
Baron 58P**

**Section VIII
Handling, Serv and Maint**

| ITEM | MATERIAL | SPECIFICATION |
|--|---|-----------------------------------|
| †14. | Lubricant, Rubber Seal | Oakite 6 Compound |
| 15. | Naphtha, Aliphatic | Federal Specification, TT-N-95 |
| 16. | Graphite, Lubricating | SS-G-659 |
| ††17. | Tape, Antiseize Tetrafluorethylene | MIL-T-27730 |
| 18. | Leak Test Compound, Oxygen Systems | MIL-L-25567 |
| 19. | Oxygen, Aviator's Breathing | MIL-O-27210 |
| * In extremely cold climates use MIL-G-23827 grease in place of MIL-G-81322. (These greases harmful to paint.) | | |
| ** Ashless dispersant oil (Continental Motors Corp. Spec. MHS-24A) recommended; a straight mineral oil is recommended for break-in period. See servicing data. | | |
| *** If grade 100 LL fuel (blue) or grade 100/130 fuel (green) not available, use grade 115/145 fuel (purple). | | |
| † | Product of Oakite Products, Inc., New York, New York. | |
| †† | For sealing pipe threads on high pressure oxygen lines. | |

APPROVED ENGINE OILS

| COMPANY | BRAND NAME |
|----------------------------------|---|
| BP Oil Corporation | BP Aero Oil D65/80 |
| Castrol Limited (Australia) | Grade 40, Castrolaero AD, Type III Grade 50, Castrolaero AD, Type II |
| Continental Oil Co. | *Conoco Aero S No. 65 (SAE 30) *Conoco Aero S No. 80 (SAE 40) Conoco Aero S (SAE 10W30) |
| Delta Petroleum Co. | Delta Avoil—Grades 30, 40, & 50 |
| Gulf Oil Corporation | *Gulfpride Aviation Series D |
| Exxon Oil Co. | Exxon Aviation Oils in Grades E65, E80, E100 E120, & A100 |
| Kendall Refining Co. | *Kendall Aviation Oil, Type D |
| Penzoil Company | Penzoil Aircraft Engine Oil, Heavy Duty Dispersant, Grades 30, 40 & 50 |
| Phillips Petroleum Co. | Phillips 66 Aviation Oil Type A (Replaced HD Aviation Oil) |
| Quaker State Oil & Ref. Corp. | Quaker State AD Aviation Engine Oil Grades 20W/30, 40, & 50 |
| Sinclair Refining Co. | Sinclair Avoil 20W40 |
| Std Oil of California | *RPM Aviation Oil(Compounded) |

**BEECHCRAFT
Baron 58P**

**Section VIII
Handling, Serv and Maint**

| COMPANY | BRAND NAME |
|--------------------------------|---|
| Shell Oil Company | Aeroshell Oil W Aeroshell Oil W (in 4 grades); Grade 120 (Nominal SAE 60)— Military Grade 1120 Grade 100 (Nominal SAE 50)— Military Grade 1100 Grade 80 (Nominal SAE 40)— Military Grade 1080 Grade 65 (Nominal SAE 20 or 30)— Military Grade 1065 |
| Socony-Mobil | *Aero Red Band HD (SAE 50) *Aero Gray Band HD (SAE 40) *Aero White Band HD (SAE 30) Mobil Aero Oil 65 { (Ashless Mobil Aero Oil 80 { Dispersant Mobil Aero Oil 100 { Aviation Mobil Aero Oil 120 { Engine Oil) |
| Texaco, Inc. | *Texaco Aircraft Engine Oil D100 *Texaco Aircraft Engine Oil D80 Texaco Aircraft Engine Oil Premium AD, Grades 65, 80, 100 |
| Union Oil Co. of California | *Union Engine Oil HD Grades 80 & 100 |

*Designates ash residue type oils;
The balance of oils are ashless.

This chart lists all oils which were certified as meeting the requirements of Teledyne Continental Motors Corporation Specification MHS-24A at the time this handbook was published. Any other oil which conforms to this specification may be used.

LAMP BULB REPLACEMENT GUIDE

| LOCATION | NUMBER |
|-------------------------------|--------------|
| Compass light | 327 |
| Dome light, cabin | 1864 |
| Electrical panel light | 327 |
| Flap position indicator light | 158-100-5T |
| Fuel selector placard light | 327 |
| ■ Ice light | A7079B-24 |
| Instrument light, flood | 313 |
| Instrument light, post | 327 |
| Landing gear position light | 327 |
| Landing light | 4596 |
| Map light | 1495 |
| Navigation light, tail | 1203 |
| Navigation light, wing | MS25309-7512 |
| Alternator out light | 327 |
| Reading light | 303 |
| Rotating beacon | A-7079B-24 |
| Tab position indicator light | 1819 |
| ■ Taxi light | 4596 |
| Step light | 1495 |

OVERHAUL AND REPLACEMENT GUIDE

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 inspections 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 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 | Every 2000 hours |
| Nose gear | Every 2000 hours |
| Actuator assembly | Every 2000 hours |
| Retract motor | Every 2000 hours |
| Retract motor brushes | Every 500 hours or on condition |
| Shimmy damper | Every 2000 hours or 3 years |
| 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 seating is approximately 50 hours.

| | |
|----------------------------------|------------------|
| Engine | Every 1400 hours |
| Engine controls | On condition |
| Engine vibration isolator mounts | On condition |

| COMPONENT | OVERHAUL OR REPLACE |
|--------------------------|---|
| Exhaust system | On condition |
| Oil cooler | On condition (Replace when contaminated) |
| Propeller | Every 1400 hours or 4 calendar years |
| Propeller controls | On condition |
| Propeller governor | Every 1400 hours |
| Turbocharger & Wastegate | Every 1400 hours or on condition |
| Dry air pressure pumps | Every 1400 hours or on condition |
| All hose | Hose carrying flammable liquids at engine overhaul or every 5 years. All other hose on condition. |

FUEL SYSTEM

| | |
|----------------------------|---|
| Fuel cells | On condition |
| Fuel quantity transmitters | On condition |
| Fuel cell drain valves | On condition |
| Fuel system check valves | On condition |
| Fuel selector valves | Inspect every 500 hours, overhaul every 1400 hours |
| Fuel boost pumps | Every 800 hours |
| Float valves | On condition |
| All hose | Hose carrying flammable liquids at engine overhaul or every 5 years. All other hose on condition. |
| Fuel pumps, engine-driven | Every 1400 hours |

| COMPONENT | OVERHAUL OR REPLACE |
|------------------|----------------------------|
|------------------|----------------------------|

INSTRUMENTS

| | |
|--|-----------------------------------|
| Turn and bank indicator | On condition |
| Altimeter | Every 24 mo. per FAA directive |
| Directional gyro | On condition |
| Gyro horizon | On condition |
| Dry air pressure gage | On condition |
| Manifold pressure gage | On condition |
| Turbine inlet temp. gage | On condition |
| Cabin altitude controller | On condition |
| Cabin climb gage | On condition |
| Cabin altitude/pressure differential gage | On condition |
| Airspeed indicator | On condition |
| Rate-of-climb gage | On condition |
| Fuel flow gage | On condition |
| Tachometer | On condition |
| Flap position indicator | On condition |
| Free air temp. indicator | On condition |
| All hose | On condition |

ELECTRICAL SYSTEM

| | |
|----------------------|---|
| Dynamic brake relay | On condition |
| Battery master realy | On condition |
| Paralleling relay | On condition |
| All other relays | On condition |
| Voltage regulators | On condition |
| Heater vibrator | Replace at heater overhaul |
| Starter | Inspect at engine overhaul and overhaul or replace on condition |
| Starter relay | On condition |
| Alternator | On condition |

COMPONENT

OVERHAUL OR REPLACE

UTILITY SYSTEMS

| | |
|--------------------------------|---|
| Cabin heater | Every 500 hours of operation with periodic inspections |
| Heater ignition | Replace every 500 hours of heater operation |
| Heater ignitor and 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 |
| Evaporator blower | On condition |
| Evaporator blower brushes | Every 500 hours |
| Oxygen regulator | Every 2000 hours or 48 months |
| Oxygen cylinder (3HT) | Hydrostatically test every 3 years, replace every 15 years or 4,380 refills (ICC Regulation) |
| Oxygen cylinder (3A or 3AA) | Hydrostatically test every 5 years; no replacement duration |
| Differential control valve | Inspect every 100 hours, replace on condition |
| Safety valve | Inspect every 100 hours, replace on condition |

FLAPS AND FLIGHT CONTROLS

| | |
|----------------------|--------------|
| Flight controls | On condition |
| Aileron tab actuator | On condition |

| COMPONENT | OVERHAUL OR REPLACE |
|------------------|----------------------------|
|------------------|----------------------------|

FLAPS AND FLIGHT CONTROLS (Cont'd)

| | |
|-----------------------|------------------|
| Elevator tab actuator | On condition |
| Rudder tab actuator | On condition |
| Flap track rollers | Every 1000 hours |
| Flap motor and drives | Every 2000 hours |
| Flap gearbox | Every 2000 hours |
| Flap actuators | Every 2000 hours |
| Flap flexible shaft | Every 2000 hours |

NOTE

Any time the control surfaces are altered, repaired, or repainted, they must be rebalanced per Maintenance Manual.

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. Airplane Flight Manual Supplements for equipment for which the vendor obtained a Supplemental Type Certificate were included as loose equipment with the airplane at the time of delivery. These and other Airplane Flight Manual Supplements for other equipment that was installed after the airplane was delivered new from the factory should be placed in this Supplemental Data Section IX, of this Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

INTENTIONALLY LEFT BLANK

PILOT'S OPERATING HANDBOOK
AND
FAA APPROVED AIRPLANE FLIGHT MANUAL
(TJ-46, TJ-55, TJ-83, AND TJ-85 THRU TJ-168)
102-590000-31
LOG OF SUPPLEMENTS

| <i>FAA Supplements must be in the airplane for flight operation when subject equipment is installed.</i> | | | |
|--|---|---------|----------|
| Part Number | Subject | Rev No. | Date |
| 102-590000-39 | KN-74 Area Navigation System | | 10/76 |
| Deleted | Deleted | | 12/76 |
| 102-590000-35 | Propeller Reset Governors | 2 | 8/81 |
| 96-590011-21 | Bendix NP-2041A NAV Computer Programmer | 1 | 1/80 |
| 58-590000-25 | AirData AD611/D Area Navigation | | 6/21/77 |
| 106-590000-15 | Collins ANS-351 Area Navigation System | | 11/16/77 |
| 102-590000-47 | Item Deleted | | |
| 58-590000-27 | AirData AD-511/AD-511G Area Navigation System | 1 | 7/79 |
| 102-590000-45 | King KNC-610 Area Navigation System | | 11/78 |
| 58-590000-29 | King KNS-80 Integrated Navigation System | | 1/79 |

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

| Part Number | Subject | Rev No. | Date |
|---------------|--|---------|-------|
| 96-590010-27 | Narco RNAV 161 Multi-Waypoint Area Navigation System | | 1/79 |
| 102-590000-65 | Flight In Icing Conditions | | 10/95 |

NOTE: Supplements applicable to equipment other than installed may be removed from the manual at the discretion of the owner/operator.

** Supplements marked with an asterisk will not be supplied with handbooks sold through Authorized Beech Outlets due to their limited applicability. If a document is required for your airplane, please order the document through normal channels.*

BEECHCRAFT BARON 58P/58PA LANDPLANE

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 NAVIGATION EQUIPMENT AS REQUIRED.
2. VOR or Distance flag appears while in APPR mode:
 - a. If flag appears while on an approach, execute a 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)

FAA Approved

Date: October, 1976

P/N 102-590000-39

PERFORMANCE - No change.

Approved: 
for Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

BEECHCRAFT LANDPLANE 58P/58PA and 58TC/58TCA

PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL SUPPLEMENT for the Propeller Reset Governor 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 Propeller Reset Governors which have 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.

ENGINES

Two Continental TSIO-520-L or TSIO-520-LB six cylinder horizontally opposed, turbocharged, fuel-injected engines, each rated at 301 horsepower at 2600 rpm and 38.0 in. Hg.

Take-off and Maximum
Continuous Power 38.0 in. Hg at 2600 rpm

Maximum One-engine
Inoperative Power 38.0 in. Hg at 2700 rpm

LIMITATIONS

POWER PLANT LIMITATIONS

ENGINES

Two Continental TSIO-520-L or TSIO-520-LB six-cylinder, horizontally opposed, fuel injected turbocharged engines.

Take-off and Maximum Continuous

Power.....38.0 in. Hg at 2600 rpm

Maximum One-engine

Inoperative Power38.0 in. Hg at 2700 rpm

POWER PLANT INSTRUMENT MARKINGS

Tachometer

Normal Operating Range (Green Arc)

Two Engine 2000 to 2600 rpm

One Engine 2000 to 2700 rpm

Maximum (Red Radial)

Two Engine 2600 rpm

One Engine 2700 rpm

REQUIRED EQUIPMENT FOR VARIOUS CONDITIONS OF FLIGHT

ATA 100 CHAPTER 61, PROPELLERS

Two propeller reset governors are required to be installed and operational for all flight operations.

EMERGENCY PROCEDURES

EMERGENCY DESCENT

1. Propellers - 2600 RPM
2. Throttles - CLOSED
3. Airspeed - 175 KTS (below 21,000 feet)
4. Landing Gear - DOWN
5. Flaps - APPROACH(15°)

FAA Approved

Revised: August, 1981

P/N 102-590000-35

NORMAL PROCEDURES

BEFORE TAKE-OFF (after Magneto check)

Governors - CHECK

- (a) Propeller Controls - HIGH RPM
- (b) Throttles - 2000 RPM
- (c) Left Throttle - REDUCE MANIFOLD PRESSURE
APPROXIMATELY 5 in. Hg
- (d) Both Governor Annunciator Lights - CHECK
ILLUMINATED
- (e) Repeat for Right Engine

NOISE CHARACTERISTICS

No special noise reduction procedures are required to comply with FAR 36.1501. Corrected flyover noise levels were measured as follows:

Take-off Power, flaps 0°SPL 79.2 dB(A)

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

PERFORMANCE

| GRAPHS | PAGE |
|--|-------------|
| 1. Recommended Manifold Pressure | 4 of 11 |
| 2. Take-Off Distance | 5 of 11 |
| 3. Take-Off Distance - Grass Surface | 6 of 11 |
| 4. Accelerate - Stop | 7 of 11 |
| 5. Accelerate - Go | 8 of 11 |
| 6. Climb - Two Engine | 9 of 11 |
| 7. Climb - Balked Landing | 10 of 11 |

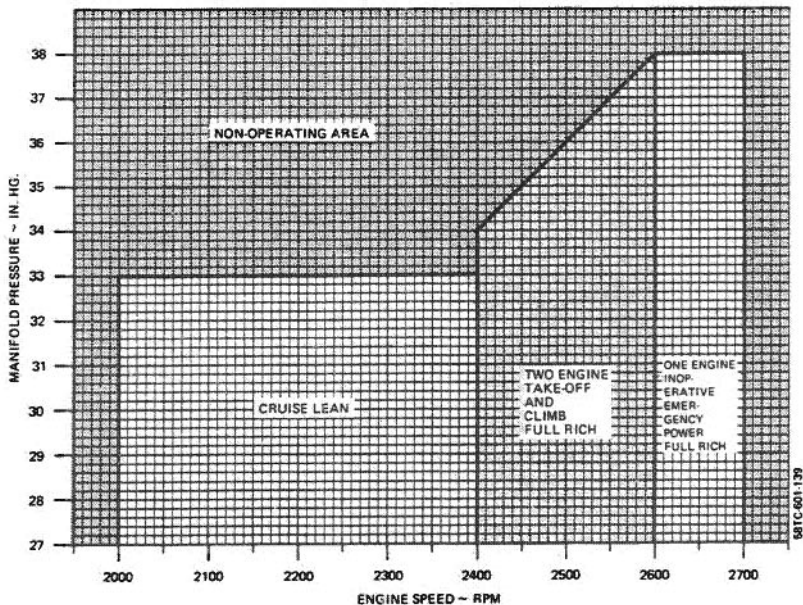
FAA Approved

Revised: August, 1981

P/N 102-590000-35

3 of 11

RECOMMENDED MANIFOLD PRESSURE



ASSOCIATED CONDITIONS:

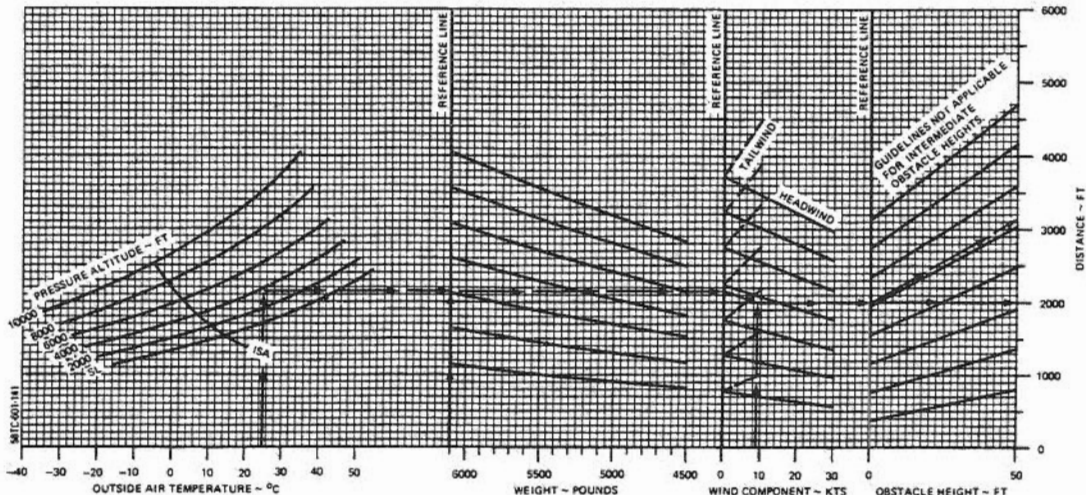
POWER TAKE-OFF AT 2600 RPM SET
BEFORE BRAKE RELEASE
FLAPS UP (10°)
LANDING GEAR RETRACT AFTER LIFT OFF
RUNWAY PAVED, LEVEL, DRY SURFACE
COWL FLAPS OPEN

TAKE-OFF DISTANCE

| WEIGHT LBS | TAKE-OFF SPEEDS - KNOTS | |
|---------------|-------------------------|-------|
| | LIFT-OFF | 50 FT |
| 6100 | 81 | 96 |
| 6000 | 81 | 96 |
| 5500 | 81 | 95 |
| 5000 | 81 | 94 |
| 4500 | 81 | 94 |

EXAMPLE:

OAT 25°C
PRESSURE ALTITUDE 3966 FT
TAKE-OFF WEIGHT 6100 LBS
HEADWIND COMPONENT 9.5 KTS
GROUND ROLL 2000 FT
TOTAL DISTANCE OVER 50 FT OBSTACLE 3130 FT
TAKE-OFF SPEEDS: AT LIFT OFF 81 KTS
AT 50 FT. 96 KTS



TAKE-OFF DISTANCE - GRASS SURFACE

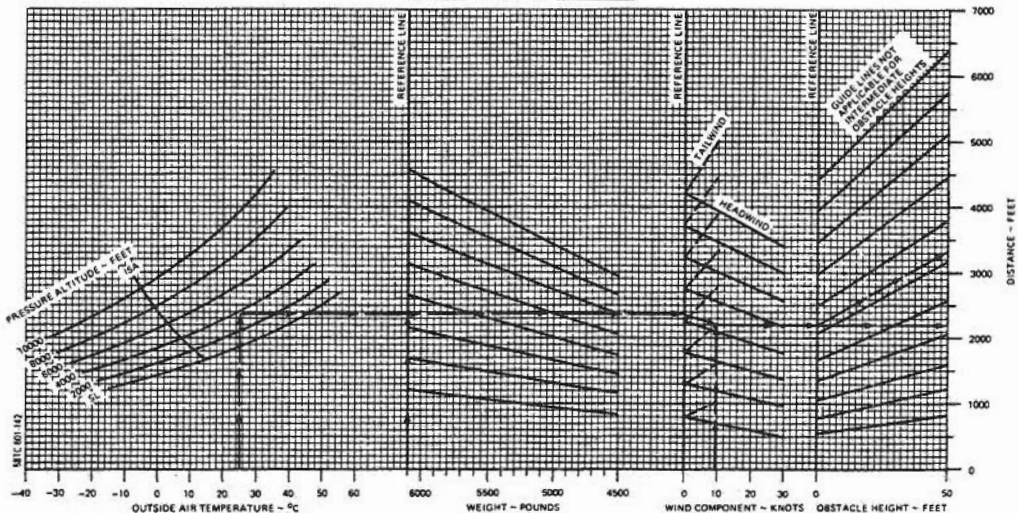
ASSOCIATED CONDITIONS

POWER TAKE OFF AT 2600 RPM SET
BEFORE BRAKE RELEASE
FLAPS UP (10°)
LANDING GEAR RETRACT AFTER LIFT OFF
RUNWAY SHORT, DRY GRASS, LEVEL SURFACE
COWL FLAPS OPEN

| WEIGHT LBS | TAKE OFF SPEEDS - KNOTS | |
|---------------|-------------------------|-------|
| | LIFT OFF | 50 FT |
| 6100 | 81 | 96 |
| 6000 | 81 | 96 |
| 5500 | 81 | 95 |
| 5000 | 81 | 94 |
| 4500 | 81 | 94 |

EXAMPLE:

DAT 25°C
PRESSURE ALTITUDE 3946 FT
TAKE OFF WEIGHT 6100 LBS
HEADWIND COMPONENT 9.5 KTS
GROUND ROLL 2200 FT
TOTAL DISTANCE OVER 50 FT OBSTACLE 3330 FT
TAKE OFF SPEED AT LIFT OFF 81 KTS
AT 50 FT 96 KTS



ACCELERATE-STOP

DECISION SPEED-81 KNOTS (ALL WEIGHTS)

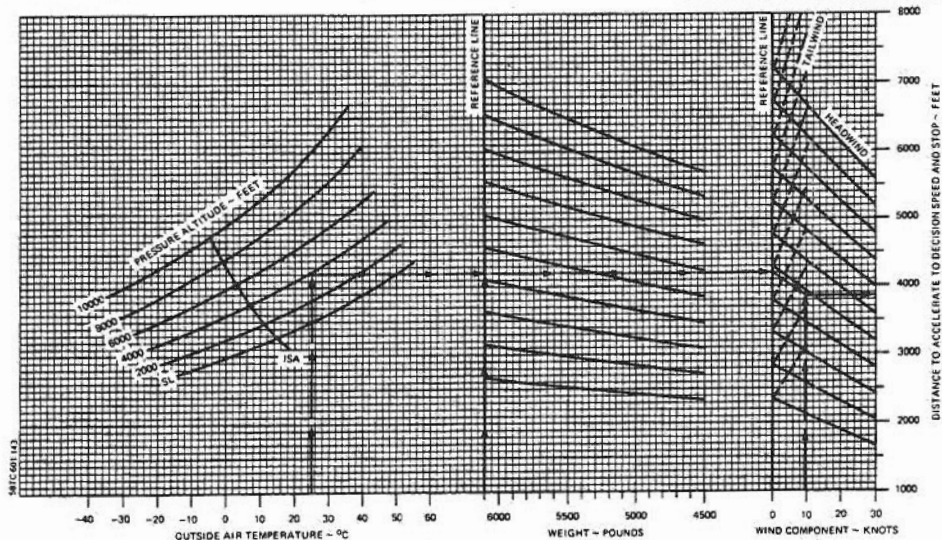
ASSOCIATED CONDITIONS:

POWER 1. TAKE-OFF POWER AT 2500 RPM
 2. SET BEFORE BRAKE RELEASE
 3. ENGINE IDLE AT DECISION SPEED
 FLAPS UP (10°)
 RUNWAY PAVED, LEVEL, DRY SURFACE
 COWL FLAPS OPEN

NOTE: DISTANCES INCLUDE 3-SECOND
 FAILURE RECOGNITION TIME.

EXAMPLE:

OAT 25°C
 PRESSURE ALTITUDE 3966 FT
 TAKE OFF WEIGHT 6100 LBS
 HEADWIND COMPONENT 9.5 KTS
 ACCELERATE AND STOP DISTANCE 3860 FT
 DECISION SPEED 81 KTS



ACCELERATE-GO

ASSOCIATED CONDITIONS:

POWER TAKE-OFF POWER AT 2600 RPM SET
BEFORE BRAKE RELEASE
FLAPS UP (0°)
LANDING GEAR RETRACT AFTER LIFT-OFF
RUNWAY PAVED, LEVEL, DRY SURFACE

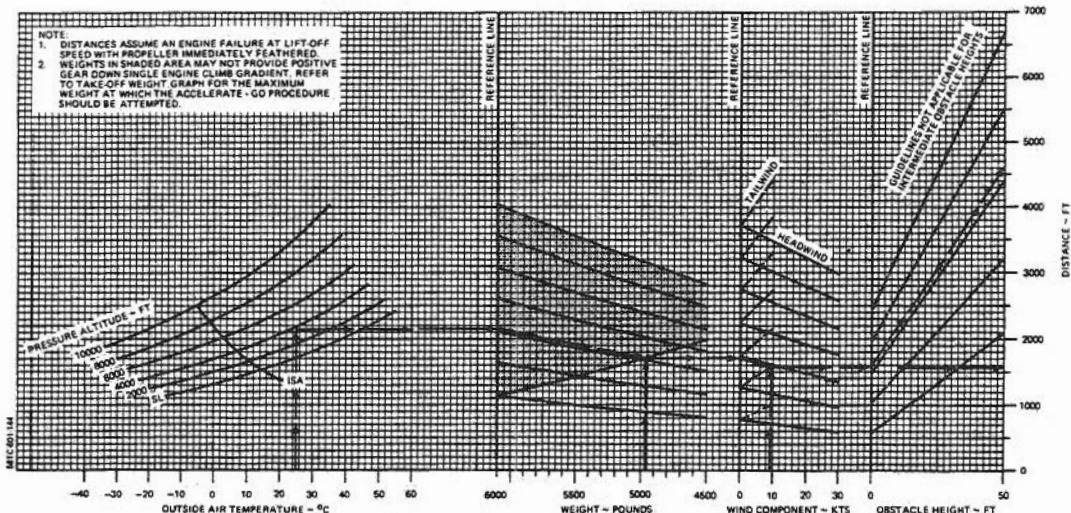
TAKE-OFF SPEEDS:

LIFT-OFF 81 KTS
50 FT 96 KTS

EXAMPLE:

OAT 25°C
PRESSURE ALTITUDE 3866 FT
TAKE-OFF WEIGHT 4875 LBS
HEADWIND COMPONENT 9.5 KTS

GROUND ROLL 1580 FT
TOTAL DISTANCE OVER 50 FT OBSTACLE 4630 FT
TAKE-OFF SPEEDS: AT LIFT-OFF 81 KTS
AT 50 FT 96 KTS



CLIMB-TWO ENGINE

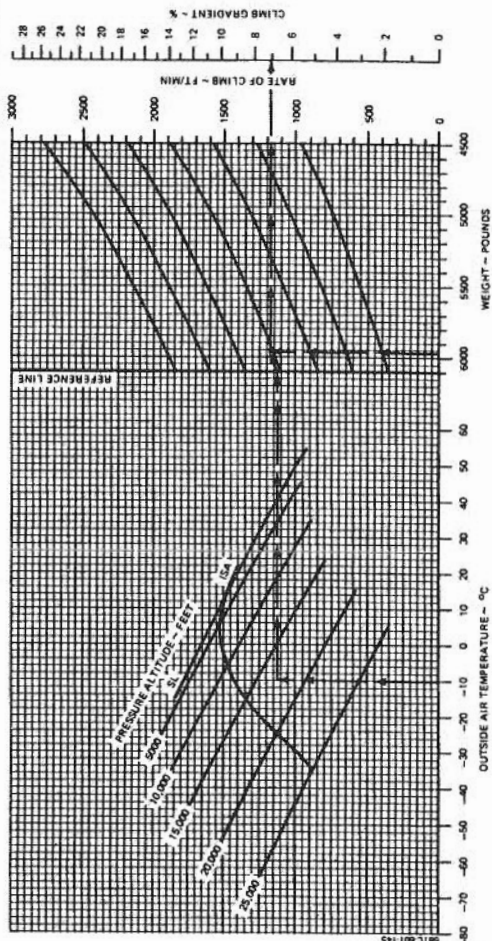
CLIMB SPEED-115 KNOTS (ALL WEIGHTS)

ASSOCIATED CONDITIONS:

POWER MAXIMUM CONTINUOUS AT 2600 RPM
FLAPS UP
LANDING GEAR UP
COWL FLAPS OPEN

EXAMPLE:

OAT -10°C
PRESSURE ALTITUDE 17,000 FT
WEIGHT 5969 LBS
RATE OF CLIMB 1175 FT/MIN
CLIMB GRADIENT 7.1%
CLIMB SPEED 115 KTS



CLIMB-BALKED LANDING

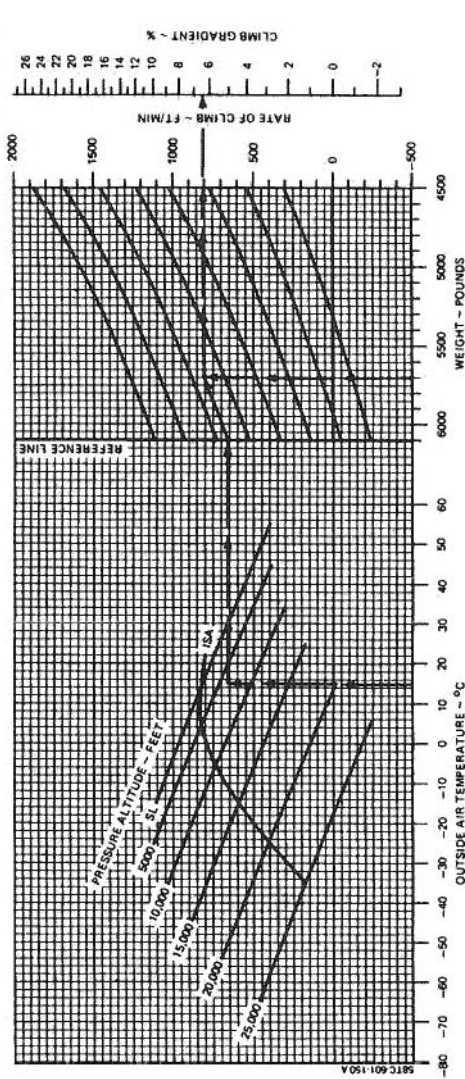
CLIMB SPEED - 92 KNOTS (ALL WEIGHTS)

ASSOCIATED CONDITIONS:

POWER TAKE-OFF AT 2600 RPM
FLAPS DOWN (30°)
LANDING GEAR DOWN

EXAMPLE:

OAT 15°C
PRESSURE ALTITUDE 5650 FT
WEIGHT 5702 LBS
RATE OF CLIMB 810 FT/MIN
CLIMB GRADIENT 6.3%
CLIMB SPEED 92 KTS



FAA Approved

Revised: August, 1981

P/N 102-590000-35

WEIGHT AND BALANCE - no change.

SYSTEMS DESCRIPTION


ENGINES

The airplane is powered by two Continental TSIO-520-L or TSIO-520-LB six-cylinder, horizontally opposed, fuel-injected engines rated at 301 horsepower each at 2600 rpm and 38 in. Hg, and are turbocharged for improved high altitude performance.

PROPELLER GOVERNOR

The airplane is equipped with two propeller governors which incorporate an automatic speed reset feature. Under normal two-engine operation, maximum propeller speed is limited to 2600 rpm by the governors. In the event of an engine malfunction the resulting split in manifold pressure releases a stop on the governor allowing single-engine operation at 2700 rpm. The system is preflight checked by advancing both propeller levers to the HIGH RPM position and retarding the throttle levers, one at a time, at any power setting, to produce approximately 4 to 5 in. Hg difference in manifold pressure. Illumination of both governor annunciator lights indicates the system has functioned.

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**

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

FAA Approved
Revised: January, 1980
P/N 96-590011-21

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.

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 ± 0.5 degrees.
 - c. DST window equals 30.0 nautical miles.
 - B. HSI
 - a. The needle should center at 0 ± 2 degrees TO.
 - b. Rotate the CRS control on the HSI for a 10 ± 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 ± 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:

Donald H. Peter

for

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

**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 ± 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 ± 5 nautical miles. Approach sensitivity, available with the APPR pushbutton depressed, provides a constant course width of ± 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.

FAA Approved
Issued: June 21, 1977
P/N 58-590000-25

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 backlit when ever 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 backlit whenever it is switched ON.

3. Digital Display:

Normally indicates the distance to the waypoint in nauti-

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 ± 1 NM.
 - b. The course setting is 000 ± 2 degrees.

FAA Approved
Issued: June 21, 1977
P/N 58-590000-25

6. Press and hold BRG and TEST buttons. Check that:
 - a. Digital display indicates 0 ± 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.

FAA Approved

Issued: June 21, 1977

P/N 58-590000-25

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_i 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 ± 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

FAA Approved
Issued: June 21, 1977
P/N 58-590000-25

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 ± 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:



f.

Chester A. Rembleske
Beech Aircraft Corporation
DOA CE-2

FAA Approved

Issued: June 21, 1977

P/N 58-590000-25

**BEEHCRAFT 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:

FAA Approved
Issued: November 16, 1977
P/N 106-590000-15

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.

FAA Approved

Issued: November 16, 1977

P/N 106-590000-15

- 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

FAA Approved

Issued: November 16, 1977

P/N 106-590000-15

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

**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

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 ± 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 ± 5 NM. During RNAV instrument approach operations the Approach position offers more sensitive needle deflection of ± 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

FAA Approved
Revised: July, 1979
P/N 58-590000-27

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

FAA Approved
Revised: July, 1979
P/N 58-590000-27

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 ± 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.

FAA Approved
Revised: July, 1979
P/N 58-590000-27

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

FAA Approved

Revised: July, 1979

P/N 58-590000-27

7 of 10

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 backlighted whenever 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 ± 5 NM for Enroute to ± 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 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).

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. Peters
for

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

**BEEHCRAFT 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.

FAA Approved
Issued January, 1979
P/N 58-590000-29

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° 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

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 ± 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 ± 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

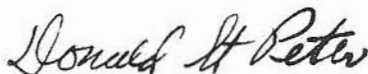
The outer knob varies the 10 NM digit with a carryover occurring from the tens to hundreds place. The center knob in the "in" position varies the 1 NM digit and in the "out" position varies the 0.1 NM digit.

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

FAA Approved
Issued January, 1979
P/N 58-590000-29

**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.

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 preceeding 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

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.

FAA Approved

Issued: January, 1979

P/N 96-590010-27

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° to 359.9° are possible in increments of $.1^{\circ}$.

Format: XXX.X i.e. 059.8

Decimal point is set automatically for bearings greater than 100° .

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

FAA Approved
Issued: January, 1979
P/N 96-590010-27

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.

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 ± 2.5 NM or 5 NM constant course width.

Course width in the RNAV APPR mode is 2.5 NM or a sensitivity of ± 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.

FAA Approved
Issued: January, 1979
P/N 96-590010-27

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 preceding 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.

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®

58P, 58PA, 58TC, 58TCA LANDPLANES

**Pilot's Operating Handbook and
FAA Approved Airplane Flight Manual
Supplement
for
Flight In Icing Conditions**

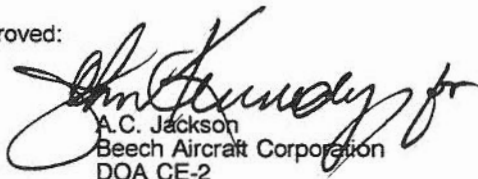
This Supplement is applicable to the following manual(s):

102-590000-13B, 102-590000-31, 102-590000-41,
102-590000-57,
106-590000-5, 106-590000-19, 106-590000-21

Airplane Serial Number: _____

Airplane Registration Number: _____

FAA Approved:


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

COPYRIGHT © BEECH 1995

**FAA Approved
Issued: October, 1995
P/N 102-590000-65**

1 of 6

CONTENTS

| | |
|---|--------|
| GENERAL | Page 2 |
| LIMITATIONS | Page 2 |
| EMERGENCY PROCEDURES..... | Page 3 |
| NORMAL PROCEDURES..... | Page 4 |
| PERFORMANCE..... | Page 5 |
| WEIGHT & BALANCE/EQUIPMENT LIST..... | Page 5 |
| SYSTEMS DESCRIPTION..... | Page 5 |
| HANDLING, SERVICING & MAINTENANCE | Page 5 |

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 whenever the airplane is flown in icing conditions.

LIMITATIONS

ICING LIMITATIONS

Minimum Airspeed for Sustained Icing Flight.....130 Knots

Sustained flight in icing conditions is prohibited with flaps extended. This does not include approach and landings.

Windshield Electrothermal Anti-ice

System (If Installed) Ground operation limited
to 10 minutes

FAA Approved

Issued: October, 1995

P/N 102-590000-65

EMERGENCY PROCEDURES

ICE PROTECTION SYSTEMS

OPERATIONS OUTSIDE THE FAR 25, APPENDIX C ICING ENVELOPE

Icing conditions that lie outside of the FAR 25, Appendix C icing envelope include freezing rain, freezing drizzle, mixed conditions, or conditions defined as severe. Such conditions could produce hazardous ice accumulations such as:

- Ice accumulations which exceed the capabilities of ice protection equipment
- Ice accumulations which produce unacceptable performance reductions

The pilot should be continuously alert to the possibility that icing conditions which lie outside the FAR 25, Appendix C envelope may produce hazardous accumulations and divert the flight as soon as such conditions are confirmed. Early cues that such conditions exist include:

- Ice accumulations on the prop spinners which extend further aft than normally observed
- Ice accumulations which occur beyond the aft limit of the wing boots
- Continued increases in power which fail to curtail air-speed decelerations

NORMAL PROCEDURES

ICING FLIGHT

This airplane is approved for flight in icing conditions as defined in FAR 25, Appendix C, when equipped in accordance with Beech Drawing 102-000018 or Beech Kit Drawing 102-5006. These conditions do not include, nor were tests conducted in, all icing conditions that may be encountered (e.g., freezing rain, freezing drizzle, mixed conditions, or conditions defined as severe). Some icing conditions not defined in FAR 25 have the potential of producing hazardous ice accumulations, which: 1) exceed the capabilities of the airplane's ice protection equipment and/or 2) create unacceptable airplane performance. Flight into icing conditions which lie outside the FAR-defined conditions is not prohibited; however, pilots must be prepared to divert the flight promptly if hazardous ice accumulations occur.

Refer to the POH/AFM, Section II, LIMITATIONS, for limitations relating to icing flight, and the POH/AFM, Section III, EMERGENCY PROCEDURES, for emergency procedures associated with icing equipment malfunctions and operations outside the FAR 25, Appendix C icing envelope.

WARNING

Due to distortion of the wing airfoil, ice accumulations on the leading edges can cause a significant loss in rate of climb and in speed performance, as well as increases in stall speed. Even after cycling the deicing boots, the ice accumulation remaining on the boots and unprotected areas of the airplane can cause large performance losses. For the same reason, the aural stall warning system may not be accurate and should not be relied upon. Maintain a comfortable margin of airspeed above the normal stall airspeed. In order to minimize ice accumulation on unprotected surfaces of the wing, maintain a minimum of 130 knots during operations in sustained icing conditions. If ice continues to accumulate on the airplane, exit icing conditions as soon as possible. Prior to a landing approach, cycle the deicing boots to shed any accumulated ice.

PERFORMANCE

No Change

WEIGHT & BALANCE/EQUIPMENT LIST

No Change

SYSTEMS DESCRIPTION

No Change

HANDLING, SERVICING & MAINTENANCE

No Change

FAA Approved

Issued: October, 1995

P/N 102-590000-65

**THIS PAGE INTENTIONALLY LEFT
BLANK**

SECTION X
SAFETY INFORMATION
TABLE OF CONTENTS

| <i>SUBJECT</i> | <i>PAGE</i> |
|---|-------------|
| Introduction | 3 |
| General | 5 |
| Do's | 5 |
| Don'ts | 6 |
| Sources of Information | 7 |
| Pilot's Operating Handbook and FAA Approved Airplane Flight Manual | 7 |
| BEECHCRAFT Service Publications | 7 |
| Federal Aviation Regulations | 9 |
| Airworthiness Directives | 10 |
| Airman's Information Manual | 10 |
| Advisory Information | 11 |
| FAA Advisory Circulars | 11 |
| FAA General Aviation News | 15 |
| FAA Accident Prevention Program | 15 |
| Additional Information | 16 |
| General Information on Specific Topics | 17 |
| Maintenance | 17 |
| Hazards of Unapproved Modifications | 19 |
| Flight Planning | 20 |
| Passenger Information Cards | 20 |
| Stowage of Articles | 21 |
| Flight Operations | 21 |
| General | 21 |
| Preflight Inspection | 21 |
| Weight and Balance | 22 |
| Autopilots and Electric Trim Systems | 23 |
| Flutter | 26 |
| Turbulent Weather | 28 |
| Wind Shear | 30 |
| Flight in Icing Conditions | 31 |
| Weather Radar | 36 |
| Mountain Flying | 39 |
| VFR - Low Ceilings | 39 |

SECTION X

SAFETY INFORMATION

TABLE OF CONTENTS (Continued)

| <i>SUBJECT</i> | <i>PAGE</i> |
|---|-------------|
| VFR at Night | 40 |
| Vertigo - Disorientation | 40 |
| Flight of Multi-Engine Airplanes With One Engine Inoperative | 42 |
| Air Minimum Control Speed (V_{MCA}) | 44 |
| Intentional One-Engine Inoperative Speed (V_{SSE}) | 45 |
| One-Engine-Inoperative Best Rate-of-Climb Speed (V_{YSE}) | 45 |
| One-Engine-Inoperative Best Angle-of-Climb Speed (V_{XSE}) | 46 |
| Single Engine Service Ceiling | 46 |
| Basic Single Engine Procedures | 46 |
| Engine Failure on Takeoff | 47 |
| When to Fly V_X , V_Y , V_{XSE} and V_{YSE} | 48 |
| Stalls, Slow Flight and Training | 48 |
| Spins | 51 |
| Descent | 53 |
| Vortices - Wake Turbulence | 54 |
| Takeoff and Landing Conditions | 55 |
| Medical Facts for Pilots | 55 |
| General | 55 |
| Fatigue | 56 |
| Hypoxia | 56 |
| Hyperventilation | 58 |
| Alcohol | 59 |
| Drugs | 60 |
| Scuba Diving | 61 |
| Carbon Monoxide and Night Vision | 61 |
| Decompression Sickness | 61 |
| A Final Word | 63 |

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

Section X **Safety Information**

Beechcraft **Twin Engine (Piston)**

to obtain publications relating to your airplane is contained in BEECHCRAFT Service Bulletin number 2001, entitled "General - BEECHCRAFT Service Publications - What is Available and How to Obtain It."

Beech Aircraft Corporation automatically mails original issues and revisions of BEECHCRAFT Service Bulletins (Mandatory, Recommended and Optional), FAA Approved Airplane Flight Manual Supplements, reissues and revisions of FAA Approved Airplane Flight Manuals, Flight Handbooks, Owners Manuals, Pilot's Operating Manuals and Pilot's Operating Handbooks, and original issues and revisions of BEECHCRAFT Safety Communiques to BEECHCRAFT Owner addresses as listed by the FAA Aircraft Registration Branch List and the BEECHCRAFT International Owner Notification Service List. While this information is distributed by Beech Aircraft Corporation, Beech can not make changes in the name or address furnished by the FAA. The owner must contact the FAA regarding any changes to name or address. Their address is: FAA Aircraft Registration Branch (AAC250) P.O. Box 25082, Oklahoma City, OK 73125, Phone (405) 680-2131.

It is the responsibility of the FAA owner of record to ensure that any mailings from Beech are forwarded to the proper persons. Often the FAA registered owner is a bank or financing company or an individual not in possession of the airplane. Also, when an airplane is sold, there is a lag in processing the change in registration with the FAA. If you are a new owner, contact your BEECHCRAFT Authorized Outlet and ensure your manuals are up to date.

Beech Aircraft Corporation provides a subscription service which provides for direct factory mailing of BEECHCRAFT publications applicable to a specific serial number airplane. Details concerning the fees and ordering information for this owner subscription service are contained in Service Bulletin number 2001.

For owners who choose not to apply for a Publications Revision Subscription Service, Beech provides a free Owner

Notification Service by which owners are notified by post card of BEECHCRAFT manual reissues, revisions and supplements which are being issued applicable to the airplane owned. On receipt of such notification, the owner may obtain the publication through a BEECHCRAFT Authorized Outlet. This notification service is available when requested by the owner. This request may be made by using the owner notification request card furnished with the loose equipment of each airplane at the time of delivery, or by a letter requesting this service, referencing the specific airplane serial number owned. Write to :

Supervisor, Special Services
Dept. 52
Beech Aircraft Corporation
P.O. Box 85
Wichita, Kansas 67201-0085

From time to time Beech Aircraft Corporation issues BEECHCRAFT Safety Communiques dealing with the safe operation of a specific series of airplanes, or airplanes in general. It is recommended that each owner/operator maintain a current file of these publications. Back issues of BEECHCRAFT Safety Communiques may be obtained without charge by sending a request, including airplane model and serial number, to the Supervisor, Special Services, at the address listed above.

Airworthiness Directives (AD's) are not issued by the manufacturer. They are issued and available from the FAA.

FEDERAL AVIATION REGULATIONS

FAR Part 91, General Operating and Flight Rules, is a document of law governing operation of airplanes and the owner's and pilot's responsibilities. Some of the subjects covered are:

Responsibilities and authority of the pilot-in-command

Section X

Safety Information

Beechcraft

Twin Engine (Piston)

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

Section X
Safety Information

Beechcraft
Twin Engine (Piston)

ordering information. Many Advisory Circulars which are for sale can be purchased locally in aviation bookstores or at FBO's. These documents are subject to periodic revision. Be certain the Advisory Circular you are using is the latest revision available. Some of the Advisory Circulars of interest to pilots are:

| | |
|---------------|--|
| *00-6 | Aviation Weather |
| 00-24 | Thunderstorms |
| 00-30 | Rules of Thumb for Avoiding or Minimizing Encounters with Clear Air Turbulence |
| *00-45 | Aviation Weather Services |
| 00-46 | Aviation Safety Reporting Program |
| 20-5 | Plane Sense |
| 20-32 | Carbon Monoxide (CO) Contamination in Aircraft - Detection and Prevention |
| 20-35 | Tie-Down Sense |
| 20-43 | Aircraft Fuel Control |
| 20-105 | Engine-Power Loss Accident Prevention |
| 20-113 | Pilot Precautions and Procedures to be Taken in Preventing Aircraft Reciprocating Engine Induction System and Fuel System Icing Problems |
| 20-125 | Water in Aviation Fuels |
| 21-4 | Special Flight Permits for Operation of Overweight Aircraft |
| 43-9 | Maintenance Records: General Aviation Aircraft |

| | |
|---------------|--|
| 43-12 | Preventive Maintenance |
| 60-4 | Pilot's Spatial Disorientation |
| 60-6 | Airplane Flight Manuals (AFM), Approved Manual Materials, Markings and Placards - Airplanes |
| 60-12 | Availability of Industry-Developed Guidelines for the Conduct of the Bien- nial Flight Review |
| 60-13 | The Accident Prevention Counselor Program |
| *61-9 | Pilot Transition Courses for Complex Single-Engine and Light Twin-Engine Airplanes |
| *61-21 | Flight Training Handbook |
| *61-23 | Pilot's Handbook of Aeronautical Knowledge |
| *61-27 | Instrument Flying Handbook |
| 61-67 | Hazards Associated with Spins in Air- planes Prohibited from Intentional Spinning. |
| 61-84 | Role of Preflight Preparation |
| *67-2 | Medical Handbook for Pilots |
| 90-23 | Aircraft Wake Turbulence |
| 90-42 | Traffic Advisory Practices at Nontower Airports |
| 90-48 | Pilot's Role in Collision Avoidance |
| 90-66 | Recommended Standard Traffic Pat- terns for Airplane Operations at Uncontrolled Airports |

Section X
Safety Information

Beechcraft
Twin Engine (Piston)

| | |
|---------------|---|
| 90-85 | Severe Weather Avoidance Plan (SWAP) |
| 91-6 | Water, Slush and Snow on the Runway |
| 91-13 | Cold Weather Operation of Aircraft |
| *91-23 | Pilot's Weight and Balance Handbook |
| 91-26 | Maintenance and Handling of Air Driven Gyroscopic Instruments |
| 91-33 | Use of Alternate Grades of Aviation Gasoline for Grade 80/87 |
| 91-35 | Noise, Hearing Damage, and Fatigue in General Aviation Pilots |
| 91-43 | Unreliable Airspeed Indications |
| 91-44 | Operational and Maintenance Practices for Emergency Locator Transmitters and Receivers |
| 91-46 | Gyroscopic Instruments - Good Operating Practices |
| 91-50 | Importance of Transponder Operations and Altitude Reporting |
| 91-51 | Airplane Deice and Anti-ice Systems |
| 91-59 | Inspection and Care of General Aviation Aircraft Exhaust Systems |
| 91-65 | Use of Shoulder Harness in Passenger Seats |
| 103-4 | Hazards Associated with Sublimation of Solid Carbon Dioxide (Dry Ice) Aboard Aircraft |
| 135-9 | FAR Part 135 Icing Limitations |

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.

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

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:

| Class of Turbulence | Effect |
|----------------------------|--|
| Extreme | Airplane is violently tossed about and is practically impossible to control. May cause structural damage. |
| Severe | Airplane may be momentarily out of control. Occupants are thrown violently against the belts and back into the seat. Unsecured objects are tossed about. |
| Moderate | Occupants require seat belts and occasionally are thrown against the belt. Unsecured objects move about. |

Light

Occupants may be required to use seat belts, but objects in the airplane remain at rest.

Thunderstorms, squall lines and violent turbulence should be regarded as extremely dangerous and must be avoided. Hail and tornadic wind velocities can be encountered in thunderstorms that can destroy any airplane, just as tornadoes destroy nearly everything in their path on the ground.

Thunderstorms also pose the possibility of a lightning strike on an airplane. Any structure or equipment which shows evidence of a lightning strike, or of being subjected to a high current flow due to a strike, or is a suspected part of a lightning strike path through the airplane should be thoroughly inspected and any damage repaired prior to additional flight.

A roll cloud ahead of a squall line or thunderstorm is visible evidence of extreme turbulence; however, the absence of a roll cloud should not be interpreted as denoting that severe turbulence is not present.

Even though flight in severe turbulence must be avoided, flight in turbulent air may be encountered unexpectedly under certain conditions.

The following recommendations should be observed for airplane operation in turbulent air:

Flying through turbulent air presents two basic problems, the answer to both of which is proper airspeed. On one hand, if you maintain an excessive airspeed, you run the risk of structural damage or failure; on the other hand, if your airspeed is too low, you may stall.

If turbulence is encountered, reduce speed to the turbulent air penetration speed, if given, or to the maneuvering speed, which is listed in the Limitations section of the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

These speeds give the best assurance of avoiding excessive stress loads, and at the same time provide the proper margin against inadvertent stalls due to gusts.

Beware of overcontrolling in an attempt to correct for changes in attitude; applying control pressure abruptly will build up G-forces rapidly and could cause structural damage or even failure. You should watch particularly your angle of bank, making turns as wide and shallow as possible. Be equally cautious in applying forward or back pressure to keep the airplane level. Maintain straight and level attitude in either up or down drafts. Use trim sparingly to avoid being grossly out of trim as the vertical air columns change velocity and direction. If necessary to avoid excessive airspeeds, lower the landing gear.

WIND SHEAR

Wind shears are rapid, localized changes in wind direction, which can occur vertically as well as horizontally. Wind shear can be very dangerous to all airplanes, large and small, particularly on approach to landing when airspeeds are slow.

A horizontal wind shear is a sudden change in wind direction or speed that can, for example, transform a headwind into a tailwind, producing a sudden decrease in indicated airspeed because of the inertia of the airplane. A vertical wind shear, is a sudden updraft or downdraft. Microbursts are intense, highly localized severe downdrafts.

The prediction of wind shears is far from an exact science. Monitor your airspeed carefully when flying near storms, particularly on approach. Be mentally prepared to add power and go around at the first indication that a wind shear is being encountered.

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:

| Intensity | Ice Accumulation |
|------------------|--|
| Trace | 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). |
| Light | 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. |
| Moderate | The rate of accumulation is such that even short encounters become potentially hazardous and use of deicing/anti-icing equipment or diversion is necessary. |
| Severe | 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.

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:

Section X
Safety Information

Beechcraft
Twin Engine (Piston)

All Baron and Travel Air Models - 130 KIAS

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.

3. Don't fly without airborne radar into a cloud mass containing scattered embedded thunderstorms. Embedded thunderstorms usually can not be visually circumnavigated.
4. Don't trust visual appearance to be a reliable indicator of the turbulence inside a thunderstorm.
5. Do avoid by at least 20 miles any thunderstorm identified as severe or giving an intense radar echo. This is especially true under the anvil of a large cumulonimbus.
6. Do circumnavigate the entire area if the area has 6/10 or greater thunderstorm coverage.
7. Do remember that vivid and frequent lightning indicates the probability of a severe thunderstorm.
8. Do regard as extremely hazardous any thunderstorm with tops 35,000 feet or higher, whether the top is visually sighted or determined by radar.

If you cannot avoid penetrating a thunderstorm, the following are some do's BEFORE entering the storm:

9. Tighten your safety belt, put on your shoulder harness, and secure all loose objects.
10. Plan and hold your course to take you through the storm in minimum time.
11. To avoid the most critical icing, establish a penetration altitude below the freezing level or above the level of -15°C.
12. Verify that pitot heat is on and turn on carburetor heat or engine anti-ice. Icing can be rapid at any altitude and cause almost instantaneous power failure and/or loss of airspeed indication.

MOUNTAIN FLYING

Pilots flying in mountainous areas should inform themselves of all aspects of mountain flying, including the effects of topographic features on weather conditions. Many good articles have been published, and a synopsis of mountain flying operations is included in the FAA Airman's Information Manual, Part 1.

Avoid flight at low altitudes over mountainous terrain, particularly near the lee slopes. If the wind velocity near the level of the ridge is in excess of 25 knots and approximately perpendicular to the ridge, mountain wave conditions are likely over and near the lee slopes. If the wind velocity at the level of the ridge exceeds 50 knots, a strong mountain wave is probable with extreme up and down drafts and severe turbulence. The worst turbulence will be encountered in and below the rotor zone, which is usually 8 to 10 miles downwind from the ridge. This zone is sometimes characterized by the presence of "roll clouds" if sufficient moisture is present; altocumulus standing lenticular clouds are also visible signs that a mountain wave exists, but their presence is likewise dependent on moisture. Mountain wave turbulence can, of course, occur in dry air and the absence of such clouds should not be taken as assurance that mountain wave turbulence will not be encountered. A mountain wave downdraft may exceed the climb capability of your airplane. Avoid mountain wave downdrafts.

VFR - LOW CEILINGS

If you are not instrument rated, do not attempt "VFR on Top" or "Special VFR" flight or clearances. Being caught above a solid cloud layer when an emergency descent is required (or at destination) is an extremely hazardous position for the VFR pilot. Accepting a clearance out of airport control zones with no minimum ceiling and one-mile visibility as permitted with "Special VFR" is a foolish practice for the VFR pilot.

Avoid areas of low ceilings and restricted visibility unless you are instrument rated and proficient and have an instrument equipped airplane. Then proceed with caution and with planned alternates.

VFR AT NIGHT

When flying VFR at night, in addition to the altitude appropriate for the direction of flight, pilots should maintain a safe minimum altitude as dictated by terrain, obstacles such as TV towers, or communities in the area flown. This is especially true in mountainous terrain, where there is usually very little ground reference. Minimum clearance is 2,000 feet above the highest obstacle 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:

| | |
|-----------------|---|
| Airspeed | too little, or too much, will decrease climb performance |
| Drag | gear, flaps, cowl flaps, prop, and speed |
| Power | amount available in excess of that needed for level flight |
| Weight | 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:

| Symbol | Description |
|-----------|--|
| V_{MCA} | Airspeed below which directional control cannot be maintained |
| V_{SSE} | Airspeed below which an intentional engine cut should never be made |
| V_{YSE} | Airspeed that will give the best single engine rate-of-climb (or the slowest loss of altitude) |
| V_{XSE} | Airspeed that will give the steepest angle-of-climb with one engine out |

AIR MINIMUM CONTROL SPEED (V_{MCA})

V_{MCA} is designated by the red radial on the airspeed indicator and indicates the minimum control speed, airborne at sea level. V_{MCA} 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_{MCA} 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_{MCA} . Consequently, it is not advisable to fly at speeds approaching V_{MCA} , except in training situations or during flight tests. Adhering to the practice of never flying at or below the published V_{MCA} 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° 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.)

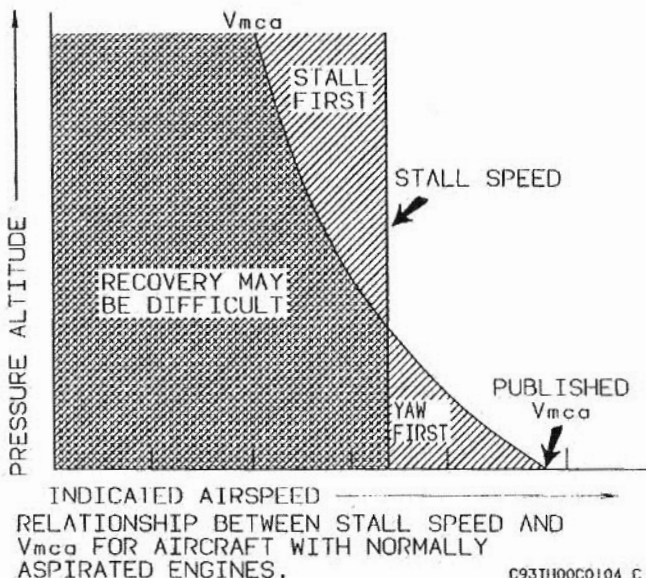
STALLS, SLOW FLIGHT AND TRAINING

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.



C93TH00C0104 C

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.

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

Section X Safety Information

Deechcraft
(Twin)Engine(Piston)

and numbness. Some of these symptoms are similar to hypoxia. The only known remedy for decompression sickness is recompression, which can only be accomplished in an unpressurized airplane by descending. The pilot should immediately descend if it is suspected that this condition exists, since the effects will only worsen with continued exposure to the reduced pressure environment at altitude and could result, if uncorrected, in complete incapacitation.

The possibility of decompression sickness can be greatly reduced by pre-breathing oxygen prior to flight and by commencing oxygen breathing well below the altitudes where it is legally mandatory.

A FINAL WORD

Airplanes are truly remarkable machines. They enable us to shrink distance and time, and to expand our business and personal horizons in ways that, not too many years ago, were virtually inconceivable. For many businesses, the general aviation airplane has become the indispensable tool of efficiency.

Advances in the mechanical reliability of the airplanes we fly have been equally impressive, as attested by the steadily declining statistics of accidents attributed to mechanical causes, at a time when the airframe, systems and power plants have grown infinitely more complex. The explosion in capability of avionics systems is even more remarkable. Radar, RNAV, LORAN, sophisticated autopilots and other devices which, just a few years ago, were too large and prohibitively expensive for general aviation size airplanes, are becoming increasingly commonplace in even the smallest airplanes.

It is thus that this Safety Information is directed to the pilot, for it is in the area of the skill and proficiency of you, the pilot, that the greatest gains in safe flying are to be made over the years to come. Intimate knowledge of your airplane, its capabilities and its limitations, and disciplined adherence to the procedures for your airplane's operation, will enable you to transform potential tragedy into an interesting hangar story when - as it inevitably will - the abnormal situation is presented.

Know your airplane's limitations, and your own. Never exceed either.

Safe flying,

BEECH AIRCRAFT CORPORATION

**THIS PAGE INTENTIONALLY LEFT
BLANK**