FAA APPROVED
AIRPLANE FLIGHT MANUAL SUPPLEMENT
For
Learjet Models 24 & 25 Series
REDUCED VERTICAL SEPARATION MINIMUM (RVSM) CAPABILITY
With
IS&S AIR DATA SYSTEM
And
ROSEMOUNT PITOT STATIC PROBES
Serial No. _________  Reg. No. _________
Installation Configuration No. _______

This Supplement must be attached to the FAA Approved Airplane Flight Manual when the airplane is modified for Reduced Vertical Separation Minimum (RVSM) Operational Capability in accordance with technical data approved by STC ST02016CH.

For limitations, Procedures, and Performance information not contained in this Supplement, consult the basic Airplane Flight Manual.

FAA APPROVED

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FAA Approved
Date: JUN 30 2010
### LOG OF REVISIONS

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<td>1</td>
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<td>Added reference to IS&amp;S 9D-80170-3 ADDU with 9B-06017-12 Config Module, Identified 3 Installation configurations, and added reference to Dee Howard XR Wing.</td>
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SECTION 0 – GENERAL

This Flight Manual Supplement is applicable to Learjet 24 and 25 series airplanes, modified by this STC, which installs a specific configuration module containing an approved Static Source Error Correction (SSEC) data for flight in Reduced Vertical Separation Minimum (RVSM) airspace.

As a prerequisite to this STC, the Learjet 24 and 25 series airplanes having certain Wings and equipped with a J.E.T. FC-110 Autopilot, are required to have been modified by STC ST01904CH which installs Innovative Solutions & Support (IS&S) Air Data System and Rosemount Pitot-Static Probes.

The applicable wings or wing modifications identified by the prerequisite STC are the “Mark II” Performance System, “Softflight I” or “Century III” Reduced Approach Speed System, and “Softflight, Century III” Wing Fences, Stall Strips, and Boundary Layer Energizers installation and the Dee Howard (STC now owned by Avcon) XR wing and pylon modifications.

The Air Data System installed by the prerequisite STC consists of 2 ea. self-sensing, RVSM capable, digital air data computing altimeters, referred to as Air Data Display Units (ADDUs), with selectable altitude alerting function. Each ADDU has a configuration module attached that contains the static source error correction data which is installed by this STC. The Analog Interface Unit (AIU) supplies an analog altitude hold error signal to the FC-110 autopilot that is proportional to the ALT HOLD errors related to ascending and descending. The AIU may not be required as the 9D-80170-3 ADDU is capable of supplying the ALT HOLD error signal in certain model aircraft.

There are 3 approved configurations as follows:

CONFIGURATION 1: Applicable to All model 24s and model 25s that have the JET FC-110 Autopilot requiring either an AC or DC altitude hold signal.

Configuration 1 uses:
- 2 ea. 9D-80130-15 IS&S Air Data Display Units (ADDU)
- 2 ea. 9B-03508-114 IS&S Configuration Modules.
- 1 ea. 9B-81040-30 IS&S Analog Interface Unit (AIU)
- 1 ea. RACB-72539-4-01 Wiring Harness
- 1 ea. RACB-72539-4-03 Wiring Harness
- 1 ea. RACB-72539-6 Accessory Circuit Breaker (ACB) Panel
CONFIGURATION 2: Applicable to all model 24s and model 25s that have the JET FC-110 Autopilot requiring either an AC or DC altitude hold signal.

Configuration 2 uses:
- 2 ea. 9D-80170-3 IS&S Air Data Display Units (ADDU)
- 2 ea. 9B-06017-12 IS&S Configuration Modules.
- 1 ea. 9B-81040-30 IS&S Analog Interface Unit (AIU)
- 1 ea. RACB-72539-4-01 Wiring Harness
- 1 ea. RACB-72539-4-03 Wiring Harness
- 1 ea. RACB-72539-6 Accessory Circuit Breaker (ACB) Panel

CONFIGURATION 3: Applicable to all model 24s and early model 25s from S/N 002 through 205, not modified for altitude hold improvement, that have the JET FC-110 Autopilot requiring an AC altitude hold signal.

Configuration 3 uses:
- 2 ea. 9D-80170-3 IS&S Air Data Display Units (ADDU)
- 2 ea. 9B-06017-12 IS&S Configuration Modules.
- 1 ea. RACB-72539-4-02 Wiring Harness
- 1 ea. RACB-72539-4-02-1 Valid Signal Inverter
- 1 ea. RACB-72539-4-03 Wiring Harness
- 1 ea. RACB-72539-6 Accessory Circuit Breaker (ACB) Panel

CONFIGURATION 5: Applicable to all model late model 25s from S/N 206 and subsequent and earlier aircraft modified for altitude hold improvement, that have the JET FC-110 Autopilot requiring a DC altitude hold signal.

Configuration 5 uses:
- 2 ea. 9D-80170-3 IS&S Air Data Display Units (ADDU)
- 2 ea. 9B-06017-41 IS&S Configuration Modules.
- 1 ea. RACB-72539-4-02 Wiring Harness
- 1 ea. RACB-72539-4-02-1 Valid Signal Inverter
- 1 ea. RACB-72539-4-03 Wiring Harness
- 1 ea. RACB-72539-6 Accessory Circuit Breaker (ACB) Panel

Note 1. Configurations 3 & 5 do NOT require the IS&S Analog Interface Unit (AIU). In this case the Pilot's ADDU has built in Analog Interfacing capabilities which will supply the autopilot altitude hold analog error signal to the FC-110 autopilot that is proportional to the ALT HOLD errors related to ascending and descending.
Air data sensing is accomplished using two heated Rosemount Pitot-Static Probes installed by the prerequisite STC. These provide an improved static source placement thereby minimizing the difference between the pressure sensed at the probe’s static port and the undisturbed ambient pressure (see system description and diagram on page 9).

The Rosemount Pitot-Static Probe System components are as follows:

- Pitot Static Probes p/n 856NA-1 (left) and 856NA-2 (right)

Other Installed components are as follows:

- Standby Barometric Altimeter
- Accessory/Circuit Breaker Panel (ACB) PN: RACB72539-6

SECTION I - LIMITATIONS

1. This aircraft has been evaluated in accordance with 14 CFR Part 91, Appendix G, “Operations in Reduced Vertical Separation Minimum (RVSM) Airspace”, and FAA Memorandum 91-RVSM, Change 2, dated February 10, 2004, “Guidance Material on the Approval of Operators/Aircraft for RVSM Operations” and is qualified for operations as an approved aircraft in RVSM airspace. This finding does not constitute approval to conduct Reduced Vertical Separation Minimum operations.
SECTION II - NORMAL PROCEDURES

1. EXTERIOR INSPECTION

POWER OFF CHECKS

A. Left Pitot Static Probe – COVER REMOVED, CLEAR OF OBSTRUCTIONS

B. Visually inspect Left Pitot-Static Probe for damage and fuselage for skin damage within a 3 foot diameter surrounding the Pitot-Static Probe. Support structure, alignment, and/or skin contour may have been altered which may cause Static Source Errors affecting flight into RVSM airspace.

C. Right Pitot Static Probe – COVER REMOVED, CLEAR OF OBSTRUCTIONS

D. Visually inspect Right Pitot-Static Probe for damage and fuselage for skin damage within a 3 foot diameter surrounding the Pitot-Static Probe. Support structure, alignment, and/or skin contour may have been altered which may cause Static Source Errors affecting flight into RVSM airspace.

2.

3. BEFORE STARTING ENGINES

POWER OFF CHECKS

A. ACB Panel
   1. ADDU MASTER switch – AS REQUIRED
   2. ADDU DAY/NIGHT TEST switch – AS REQUIRED
   3. Circuit Breakers – CHECKED

POWER ON CHECKS

A. Pilot Altimeter self test – COMPLETE
B. Copilot Altimeter self test – COMPLETE
SECTION II - NORMAL PROCEDURES

NOTES

The test sequence is performed automatically at power up and may be repeated by actuating the spring loaded test switch on the ACB Panel at any time the aircraft is under 40 knots. Actuating the test switch also illuminate each ADDU ALT lights and the AIU FAIL light. Do NOT attempt to press the small test switch on the ADDU bezel.

The test sequence first activates all segments of the LCD displays fault history (if any) and fault codes (if any), then the installation configuration is displayed. The large letters in the center of the ADDU will display "24.25". The lower right will display "1 yes" on the pilot's side and "2 yes" on the copilot's side. The lower left of the standard 9D-80130-15 ADDU (configuration 1) will display "A 105". The 9D-80170-3 integrated ADDU (configurations 2, 3, & 5) will not display the "A 105".

It is recommended that the flight crew monitor the test sequence of each ADDU prior to flight. The failure of any LCD segment, the presence of fault history or fault codes, or incorrect configuration display, requires corrective action by qualified maintenance personnel.

SYSTEM DESCRIPTION

A. Air Data Display Unit (ADDU)

The integrally-lighted ADDU incorporates an electro-mechanical pointer/LCD digital display of baro/SSEC-corrected altitude, baro-correction display, and a selected altitude display and amber altitude alert (ALT) light. The barometric altitude display range is from -1,000 to 53,000 ft. (-300 to 16,154 meters).

Barometric pressure is set manually with the BARO knob and is displayed in inches of Mercury (inHG) or hectoPascals (hPa) on the baro-correction displays. Momentarily pressing the BARO knob selects standard barometric pressure (29.92 inHG/1013 hPa) at transition altitudes. (Note that 1 hectoPascal (hPa)=1 millibar (mbar)

Units of measure for the altitude readout (M/ft) are manually changed by pressing and holding the BARO knob for more than 8 seconds.

Units of measure for the barometric readout (inHG/hPa) are manually changed by pressing and holding the BARO knob for more than 4 seconds but less than 8 seconds.
SECTION II - NORMAL PROCEDURES

SYSTEM DESCRIPTION (cont.)

The Selected Altitude function uses the ALT SEL knob for setting the alert altitude and for canceling altitude alert notifications: rotate to set, or push to cancel. On approach to the selected altitude, audio and visual alerts are issued at 1000 ft. The visual alert can be cancelled by pressing the ALT SEL knob or by selecting a new 'selected altitude', or it will extinguish automatically 200 feet from the 'selected altitude'. On departure from the 'selected altitude' audio and visual alerts are issued at 200 feet and must be manually cancelled by pressing the ALT SEL knob, or by selecting a new 'selected altitude'. Either ADDU may be used to select the alert altitude. The other ADDU will repeat the selected alert altitude.

B. ADDU Master

The ACB Panel contains an ADDU MASTER select switch which selects which ADDU (#1 pilot's or #2 copilot's) will be the master. Each ADDU, when selected, will operate in master status for the function of Altitude Alerting, Altitude Encoding for the transponder, and Altitude Information sent to the AIU (if installed) for the autopilot altitude hold function. An "A" icon in the center of the ADDU identifies it as the master.

C. Configuration Module

Each 9D-80130-15 ADDU (configuration 1) has a 9B-03508-114 Configuration Module connected to it and each 9B-80170-3 ADDU (configurations 2 & 3) has a 9B-06017-12 Configuration Module connected to it. Configuration 5 uses a 9B-06017-41 Configuration Module. The configuration module contains the airplane specific installation configuration information and SSEC data.

D. Analog Interface Unit (AIU)

The AIU (if installed) receives digital information from the ADDU selected as master and converts it to an analog signal compatible with the J.E.T. FC-110 autopilot for altitude hold capability.

The integrated 9B-80170-3 ADDU has the analog interface built into it.

(continued)
SECTION II – NORMAL PROCEDURES

SYSTEM DESCRIPTION (cont.)

An AIU FAIL indicator, a yellow lamp located near the Standby Barometric Altimeter, will illuminate if the AIU Valid Signal is not present or the 26VAC pitch reference signal from the autopilot is not present.

E. Accessory/Circuit Breaker Panel (ACB)

The ACB Panel is located in the center console. It contains the 7 circuit breakers necessary for the Air Data System. It also contains the Sonalert for altitude alerting, an ADDU MASTER select switch, a DAY/NIGHT TEST switch for dimming the ALT and AIU FAIL lights and for preflight testing of the Air Data System.

F. Rosemount Pitot/Static Probes

There are 2ea. 856NA Rosemount Pitot-Static Probes installed, one on each side of the aircraft between frames 4 and 5 via a prerequisite STC. The Total pressure (pitot) portion of the Rosemount probes replaces the original pitot tubes. The Static pressure portion of the Rosemount probes are connected only to the IS&S Air Data Computers (ADDUs). The original flush static ports are retained for use with the standby altimeter, pilot/copilot airspeed indicators, vertical speed indicators, Mach switch, and EPR system as shown.
Pitot / Static System Diagram

Note: The Pitot Tube, being the lowest point in the Pitot system, may not have a drain in the nose section of the aircraft.
SECTION II - NORMAL PROCEDURES

SYSTEM DESCRIPTION (cont.)

G. Circuit Breakers

The following circuit breakers are associated with the IS&S ADDU systems:

<table>
<thead>
<tr>
<th>CB NAME</th>
<th>AMPS</th>
<th>BUS</th>
<th>LOCATION</th>
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<tbody>
<tr>
<td>ALT PRI</td>
<td>5A</td>
<td>28 VDC PRI (Essential)</td>
<td>Copilot CB Panel</td>
</tr>
<tr>
<td>#1 ADDU</td>
<td>1A</td>
<td>28 VDC PRI ADDU</td>
<td>ACB Panel</td>
</tr>
<tr>
<td>#2 ADDU</td>
<td>1A</td>
<td>28 VDC PRI ADDU</td>
<td>ACB Panel</td>
</tr>
<tr>
<td>AIU</td>
<td>1A</td>
<td>28 VDC PRI AIU</td>
<td>ACB Panel</td>
</tr>
<tr>
<td>ALT SEC</td>
<td>5A</td>
<td>28 VDC SEC (Nonessential)</td>
<td>Copilot CB Panel</td>
</tr>
<tr>
<td>#1 ADDU</td>
<td>1A</td>
<td>28 VDC SEC ADDU</td>
<td>ACB Panel</td>
</tr>
<tr>
<td>#2 ADDU</td>
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<td>28 VDC SEC ADDU</td>
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<tr>
<td>AIU</td>
<td>1A</td>
<td>28 VDC SEC AIU</td>
<td>ACB Panel</td>
</tr>
<tr>
<td>AIU</td>
<td>1A</td>
<td>26 VAC ref from autopilot computer amplifier</td>
<td>ACB Panel</td>
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</table>

**Note:** The aircraft Primary and secondary DC Electrical Busses are referred to as the Essential and Non-Essential DC Busses in Learjet Model 25B and subsequent.
SECTION III – EMERGENCY/ABNORMAL PROCEDURES

EMERGENCY PROCEDURES

No change to basic AFM Procedures

ABNORMAL PROCEDURES

FAILURE OF BOTH ADDUs          BLANK or OFF or UNUSABLE DISPLAYS

A. Maintain aircraft control using the standby displays for attitude and altitude.
   Use the pneumatic Mach-airspeed indicators for airspeed.

B. ACB Panel circuit breakers – CHECKED

C. If in RVSM airspace, notify ATC of loss of all primary altimetry systems and
   altitude reporting capability.

D. Land as soon as possible

MASTER ADDU FAILURE          BLANK or OFF or UNUSABLE DISPLAY

A. Maintain aircraft control using the standby or cross-side ADDU display for
   altitude.

B. ACB Panel circuit breakers – CHECKED

C. ADDU MASTER switch – SELECT OPERATIONAL ADDU AS MASTER,
   verify that the selected ADDU’s Active Master “A” is illuminated.

D. If in RVSM airspace, notify ATC of loss of redundancy of primary altimetry
   systems.

SLAVE ADDU FAILURE           BLANK or OFF or UNUSABLE DISPLAY

A. Maintain aircraft control using the standby or cross-side ADDU display for
   altitude.

B. ACB Panel circuit breakers – CHECKED

C. If in RVSM airspace, notify ATC of loss of redundancy of primary altimetry
   systems.

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### MINOR ADDU FAILURES/ANNUNCIATIONS

<table>
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<tr>
<th>Equipment</th>
<th>Indication</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Pilot’s Altimeter</td>
<td>PWR flag</td>
<td>ADDU operating on SEC (Nonessential) Bus power. ADDU operates normally</td>
</tr>
<tr>
<td></td>
<td>STBY flag</td>
<td>Loss of SSEC. Select #2 ADDU as Master. ADDU not approved for RVSM operation, notify ATC of loss of redundancy of primary altimetry system. Refer to charts 4-14 &amp; 4-14A</td>
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<tr>
<td></td>
<td>COM flag</td>
<td>Loss of received communication from the cross-side ADDU. If COM (yellow) is displayed on the SLAVE ADDU, the Selected Altitude Display (counter) will blank. If COM (yellow) is displayed on the MASTER ADDU, the SLAVE unit can no longer control the Selected Altitude Display (counter)</td>
</tr>
<tr>
<td>Copilot’s Altimeter</td>
<td>PWR flag</td>
<td>ADDU operating on PRI (Essential) Bus power. ADDU operates normally</td>
</tr>
<tr>
<td></td>
<td>STBY flag</td>
<td>Loss of SSEC. Select #1 ADDU as Master. Refer to charts 4-14 &amp; 4-14A. The affected ADDU not approved for RVSM operation, notify ATC of loss of redundancy of primary altimetry system.</td>
</tr>
<tr>
<td></td>
<td>COM flag</td>
<td>Loss of received communication from the cross-side ADDU. If COM (yellow) is displayed on the SLAVE ADDU, the Selected Altitude Display (counter) of the unit will blank. If COM (yellow) is displayed on the MASTER ADDU, the SLAVE unit can no longer control the Selected Altitude Display (counter)</td>
</tr>
</tbody>
</table>
SECTION III - EMERGENCY/ABNORMAL PROCEDURES

ABNORMAL PROCEDURES (cont.)

AIU FAILURE

AIU FAIL (YELLOW) LIGHT ILLUMINATED

Autopilot altitude function is inoperative

A. Altitude hold – OFF

B. Maintain altitude manually with the autopilot pitch wheel. Closely monitor altitude.

C. ADDU MASTER switch – SELECT OTHER OPERATIONAL ADDU AS MASTER, verify that the selected ADDU’s Active Master “A” is illuminated.

D. If the AIU FAIL annunciator remains illuminated after switching ADDU’s:
   a. Verify Autopilot Altitude Hold is disengaged.
   b. If aircraft is in RVSM airspace, notify ATC of loss of Altitude Hold capability.

E. If the AIU FAIL annunciator extinguishes after switching ADDU’s:
   a. Re-Engage Autopilot Altitude Hold.
   b. Monitor and maintain aircraft altitude using the operating ADDU.(1)
   c. Cross-check aircraft altitude using the operating ADDU and the Standby Altimeter. Closely monitor altitude.
   d. If aircraft is in RVSM airspace, notify ATC of loss of redundancy of primary altimetry systems.

DIVERGENCE of ADDU’s By More Than 200 FT

Autopilot altitude function is inoperative

A. Ensure both baros are set the same.

B. If both baros are set the same:
   a. Attempt to identify the defective altimetry system by cross-checking the pilot and copilot ADDU’s with the Standby Altimeter.
SECTION III - EMERGENCY/ABNORMAL PROCEDURES

ABNORMAL PROCEDURES (cont.)

C. If unable to determine the accuracy of either altimetry system:
   a. Disengage Autopilot Altitude Hold.
   b. Monitor and maintain assigned altitude using the Standby Altimeter.
   c. If aircraft is in RVSM airspace, notify ATC of loss of all primary altimetry systems and altitude reporting capability.

D. If able to identify defective altimetry system as the Master ADDU:
   a. Disengage Autopilot Altitude Hold.
   b. SELECT OTHER OPERATIONAL ADDU AS MASTER, verify that the selected ADDU’s Active Master “A” is illuminated.
   c. Reengage Autopilot Altitude Hold.
   d. Monitor and maintain aircraft altitude using operating ADDU.
   e. Cross-check aircraft altitude using the operating ADDU and the Standby Altimeter. Closely monitor altitude.
   f. If aircraft is in RVSM airspace, notify ATC of loss of redundancy of primary altimetry systems.

E. If able to identify defective altimetry system as the Slave ADDU:
   a. Monitor and maintain aircraft altitude using operating ADDU.
   b. Cross-check aircraft altitude using the operating ADDU and the Standby Altimeter. Closely monitor altitude.
   c. If aircraft is in RVSM airspace, notify ATC of loss of redundancy of primary altimetry systems.

PITOT HEAT FAILURE  PITOT (AMBER) ANNUNCIATOR ILLUMINATED

A. Maintain aircraft control using the standby altimeter

B. Alternate Static Source – SELECTED

If the autopilot is engaged:

C. Altitude hold – OFF

D. Maintain altitude manually with the autopilot pitch wheel. Closely monitor altitude.
SECTION IV – PERFORMANCE

INTRODUCTION

The new Rosemount pitot static probe installation changes the static source position error for the basic aircraft. New charts included in this AFM Supplement were derived from flight test calibrations. The chart numbering system in this AFM Supplement matches the basic aircraft AFM to the maximum extent possible.

The pilot and copilot altimeters are identical, electrically-powered IS&S ADDUs. The Rosemount probe pitot and static lines are routed to the ADDUs (see system description and diagram on page 9).

The standby altimeter is connected to the original flush static ports, and has a considerably larger static source error as compared to the Rosemount probe static source. The pilot and copilot airspeed indicators receive total pressure from the Rosemount pitot-static probes, and static pressure from the flush static ports. Therefore, the airspeed indicators position error is also from the flush static ports and remains essentially unchanged from that of the aircraft's original system.

The following charts, 4-14 and 4-14A, represent the error associated with the Rosemount pitot-static system installation which is connected to the IS&S ADDUs. The Configuration Modules incorporated within the ADDUs subtracts the static source error, thus the crew sees only corrected altitude without errors (no altitude position correction chart required). However, should a malfunction occur in either of the air data computers the ADDU will illuminate the “STBY” flag which indicates that the ADDU no longer displays corrected information. In this case the crew should refer to charts 4-14 and 4-14A “with Zero SSEC Curve” to obtain corrected altitude position information.

Charts 4-15 and 4-15A represent the error associated with the existing flush static system installation which is connected to the standby altimeter. The altitude displayed on the standby altimeter contains these errors thus the crew should refer to charts 4-15 and 4-15A to obtain corrected standby altimeter altitude position information.
Figure 4-14

Pilot and CoPilot Altitude Position Error

Rosemount Pitot Static Probe

ALTITUDE POSITION CORRECTION
ADDU WITH ZERO SSEC CURVE

EXAMPLE:
ALTITUDE 30000 FT.
AIRSPEED 315 KIAS
POSITION CORRECTION PLUS 20 FT
ACTUAL ALTITUDE 30020 FT

INDICATED AIRSPEED - KNOTS

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Figure 4-14A

Pilot and Copilot Altitude Position Error

Rosemount Pitot Static Probe

ALTITUDE POSITION CORRECTION
ADU WITH ZERO SSEC CURVE
FLAPS - TO 8°, 10°, 20° OR 40° GEAR UP OR DOWN

<table>
<thead>
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<td>220</td>
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</tbody>
</table>

INDICATED AIRSPEED - KNOTS

FLAPS 20, GEAR UP
FLAPS 40, GEAR DOWN
FLAPS 8 OR 10 GEAR UP
FLAPS 20, GEAR DOWN
Figure 4-15

Flush Static Ports

ALTITUDE POSITION CORRECTION
STANDBY ALTIMETER

EXAMPLE:
FLAPS UP
GEAR UP

ALTITUDE
20000 FT.
AIRSPEED
255 KIAS
POSITION CORRECTION
MINUS 200 FT
ACTUAL ALTITUDE
19800 FT

INDICATED AIRSPEED - KNOTS
100 150 200 250 300 350 400

ALTITUDE POSITION CORRECTION - FEET
100 0 -100 -200 -300 -400 -500 -600

SEA LEVEL
45000 FT
10000 FT
20000 FT
30000 FT

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Figure 4-15A

Flush Static Ports

ALTIMETER
STANDBY ALTIMETER
FLAPS - TO 8°, 10°, 20° OR 40° GEAR UP OR DOWN

EXAMPLE:
FLAPS 20, GEAR UP/DOWN
AIRSPEED 194 KIAS
POSITION ERROR -120 FT

INDICATED AIRSPEED - KIAS

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