Boeing 727 MLS Terminal Instrument Procedures (TERPS) Approach Data Collection and Processing

Data Report

Edward J. Pugacz

May 1987

DOT/FAA/CT-TN87/9

This document is available to the U.S. public through the National Technical Information Service, Springfield, Virginia 22161.

DISTRIBUTION STATEMENT A
Approved for public release
Distribution Unlimited

U.S. Department of Transportation
Federal Aviation Administration
Technical Center
Atlantic City International Airport, N.J. 08405
NOTICE

This document is disseminated under the sponsorship of the Department of Transportation in the interest of information exchange. The United States Government assumes no liability for the contents or use thereof.

The United States Government does not endorse products or manufacturers. Trade or manufacturer's names appear herein solely because they are considered essential to the object of this report.
This report documents the approaches portion of the Fixed Wing Microwave Landing System (MLS) Terminal Instrument Procedures (TERPS) data collection and processing project using a Boeing 727 (B-727) aircraft. This is one part of the Fixed Wing MLS TERPS data collection and processing program being performed at the Federal Aviation Administration (FAA) Technical Center. The program was undertaken to collect flight test data in various aircraft to establish a data base for development of MLS TERPS criteria.

Data were collected during both missed approaches and landings using glideslopes of 3°, 3° CAT II, 3.5°, and 4° with all flights being tracked by ground based tracking systems.

Statistical processing was performed on both the airborne and tracker data, and various graphical plots were produced. The processed data were delivered to AVN-210 for inclusion in the MLS TERPS criteria development data base.
TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>EXECUTIVE SUMMARY</td>
<td>vii</td>
</tr>
<tr>
<td>INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>Background and Objectives</td>
<td>1</td>
</tr>
<tr>
<td>SYSTEM/EQUIPMENT DESCRIPTION</td>
<td>1</td>
</tr>
<tr>
<td>MLS and Precision Distance Measuring Equipment</td>
<td>1</td>
</tr>
<tr>
<td>Test Aircraft</td>
<td>1</td>
</tr>
<tr>
<td>Airborne Data Collection Equipment</td>
<td>2</td>
</tr>
<tr>
<td>Aircraft Tracking Equipment</td>
<td>2</td>
</tr>
<tr>
<td>Test Location</td>
<td>2</td>
</tr>
<tr>
<td>PROCEDURE DEVELOPMENT AND EVALUATION</td>
<td>2</td>
</tr>
<tr>
<td>OPERATIONAL PROCEDURES</td>
<td>5</td>
</tr>
<tr>
<td>Subject Pilot Selection</td>
<td>5</td>
</tr>
<tr>
<td>Subject Pilot Briefing</td>
<td>5</td>
</tr>
<tr>
<td>Data Collection Flights</td>
<td>5</td>
</tr>
<tr>
<td>DATA PROCESSING</td>
<td>6</td>
</tr>
<tr>
<td>Flight Test Data</td>
<td>6</td>
</tr>
<tr>
<td>Subject Pilot Questionnaires</td>
<td>6</td>
</tr>
<tr>
<td>Plan and Profile Validity Plots</td>
<td>6</td>
</tr>
<tr>
<td>Merge</td>
<td>7</td>
</tr>
<tr>
<td>Fill</td>
<td>7</td>
</tr>
<tr>
<td>Data Partitioning</td>
<td>7</td>
</tr>
<tr>
<td>Statistics</td>
<td>8</td>
</tr>
<tr>
<td>RESULTS</td>
<td>8</td>
</tr>
<tr>
<td>Statistics Printouts and Tapes</td>
<td>8</td>
</tr>
<tr>
<td>Composite Plots has</td>
<td>12</td>
</tr>
<tr>
<td>Isoprobability Plots</td>
<td>12</td>
</tr>
<tr>
<td>Landing Segment Scatter Plots</td>
<td>12</td>
</tr>
<tr>
<td>Deliveries</td>
<td>12</td>
</tr>
<tr>
<td>APPENDIXES</td>
<td></td>
</tr>
<tr>
<td>A - Subject Pilot Information Package</td>
<td></td>
</tr>
<tr>
<td>B - Flight Logs</td>
<td></td>
</tr>
<tr>
<td>C - Subject Pilot Questionnaire</td>
<td></td>
</tr>
<tr>
<td>D - Sample Validity Plots</td>
<td></td>
</tr>
<tr>
<td>E - Sample Summary Statistics</td>
<td></td>
</tr>
<tr>
<td>F - Minima Analysis</td>
<td></td>
</tr>
<tr>
<td>G - Composite Plots</td>
<td></td>
</tr>
<tr>
<td>H - Isoprobability Plots</td>
<td></td>
</tr>
<tr>
<td>I - Sample Landing Segment Scatter Plots</td>
<td></td>
</tr>
</tbody>
</table>

Accesion For

<table>
<thead>
<tr>
<th>NTIS CR&amp;I</th>
<th>DTIC TAB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unannounced</td>
<td>Unannounced</td>
</tr>
</tbody>
</table>

Distribution /

Availability

A-1
<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Airborne Data Collection Parameters</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Sequence of Approaches and Departures</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>List of Usable Runs</td>
<td>7</td>
</tr>
<tr>
<td>4</td>
<td>Standard Statistics</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>Standard Statistics Equations</td>
<td>9</td>
</tr>
<tr>
<td>6</td>
<td>Parameters for Statistical Calculations; Intermediate and Final Approach Segments</td>
<td>10</td>
</tr>
<tr>
<td>7</td>
<td>Parameters for Statistical Calculations; Missed Approach Segment Longitudinal Bins</td>
<td>11</td>
</tr>
<tr>
<td>8</td>
<td>Parameters for Statistical Calculations; Missed Approach Segment Vertical Bins</td>
<td>11</td>
</tr>
<tr>
<td>9</td>
<td>Parameters for Statistical Calculations; Missed Approach Segment Minima Analysis</td>
<td>11</td>
</tr>
</tbody>
</table>
This report documents the Federal Aviation Administration (FAA) Technical Center's Boeing 727 (B-727) Fixed Wing Microwave Landing System (MLS) Terminal Instrument Procedures (TERPS) approach data collection and processing project. This is one portion of the Technical Center's MLS TERPS data collection program. As the implementation of MLS approaches, the application of Instrument Landing System (ILS) TERPS criteria to MLS guided procedures has become inadequate due to the MLS's more extensive guidance capabilities. The Technical Center's Engineering Division, ACT-100, was tasked by the Standards Development Branch, AVN-210, Aviation Standards National Field Office, through the Navigation and Landing Division, APM-400, with collecting and processing MLS TERPS flight test data in a Boeing-727 heavy jet aircraft. AVN-210 will use the data collected during this project, and additional projects being conducted in various aircraft by the Technical Center and other organizations, to develop MLS TERPS criteria.

During this flight test series, various approach and departure procedures were flown in the Technical Center's B-727 (N-40) to and from runway 13/31 at the Atlantic City International Airport (ACY). The departure procedures flown will be the subject of another report. A Bendix Basic Narrow MLS was used, along with a Bendix MLS receiver and precision distance measuring equipment (PDME) interrogator. Approach angles of 3°, 3° CAT-II, 3.5°, and 4° were used for both missed approaches and landings. Seventeen subject pilots from industry and government completed the entire flight test series, with three others flying partial missions. All flights had aircraft parameters recorded by an on-board data collection system, and were tracked throughout by ground based tracking systems.

The airborne and tracking data from each flight was checked for validity, merged, and gaps in the data were filled by either linear interpolation or a least-squares quadratic polynomial curve fitting routine. The data were partitioned into bins, and statistical calculations were performed. Plan, profile, composite, isoprobability and scatter plots were drawn. The processed data were delivered to AVN-210 for inclusion in the MLS TERPS criteria development data base.
INTRODUCTION

BACKGROUND AND OBJECTIVES.

As the implementation of the Microwave Landing System (MLS) approaches, the application of Instrument Landing System (ILS) Terminal Instrument Procedures (TERPS) criteria to MLS guided approaches and departures has become inadequate due to MLS's more extensive guidance capabilities. The Federal Aviation Administration (FAA) Technical Center's Engineering Division, ACT-100, was tasked by the Standards Development Branch, AVN-210, Aviation Standards National Field Office, through the Navigation and Landing Division, APM-400, with collecting and processing MLS TERPS flight test data in a Boeing-727 (B-727) heavy jet aircraft. AVN-210 will use the data collected during this project, and other projects being conducted in various aircraft by the Technical Center and other organizations, to develop an MLS TERPS criteria data base.

SYSTEM/EQUIPMENT DESCRIPTION

MLS AND PRECISION DISTANCE MEASURING EQUIPMENT.

The "Basic Narrow" MLS used for this project was developed for the FAA by the Communications Division of the Bendix Corporation. It consists of azimuth and elevation subsystems in a noncollocated configuration. It provides proportional guidance through +40° of azimuth and 0° to 15° in elevation in the Phase III signal format. An International Civilian Aviation Organization (ICAO) signal format MLS could not be procured in time for this phase of the project. The precision distance measuring equipment (PDME) ground station was developed for the FAA by Cardion, and was located near the MLS azimuth site. Aircraft guidance was provided by a Bendix Service Test and Evaluation Program (STEP) MLS receiver and a Bendix STEP PDME interrogator.

TEST AIRCRAFT.

The test aircraft was the Technical Center's B-727, registration N-40. This is a large commercial jet aircraft with a maximum gross weight of 160,000 pounds, a cruising speed of 350 knots, and approach speeds in the range of 130 to 140 knots. The aircraft is standard, except that the electrical system has been upgraded to handle the additional loads of project equipment. For project data collection purposes the aircraft's avionics were augmented with a Litton LTN-51 Inertial Navigation System (INS) a Collins ADC-80F Digital Air Data Computer (DADC), and a Bendix MLS receiver and PDME interrogator.
AIRBORNE DATA COLLECTION EQUIPMENT.

The airborne data collection system (figure 1) is controlled by a Norden PDP 11/34M ruggedized minicomputer. An ACT-140 developed aircraft systems coupler (ASC) retrieves analog, synchro, discrete, and serial digital aircraft sensor data along with time code generator data, and formats it in 16-bit parallel form for processing by the computer. The data were recorded on a Kennedy 9-track tape recorder five times per second. The parameters collected are listed in table 1.

AIRCRAFT TRACKING EQUIPMENT.

In order to assure continuous tracking of the aircraft during all maneuvers, two different tracking systems were used: Extended Area Instrumentation Radar (EAIR) and a laser tracker.

The Technical Center's EAIR is a precision C-band instrumentation radar system that was designed to measure and record an aircraft's position in slant range and azimuth and elevation angles. In the primary tracking mode, EAIR has a maximum range of 100 nautical miles (nmi), and a minimum tracking distance of 1 nmi. This was the primary method of tracking the aircraft at distances of 5 nmi and greater from the ground point of intercept (GPI).

The pulsed infrared laser tracker is positioned approximately 0.5 mile north of runway 13/31. A mirrored retroreflector was mounted below the cockpit of the aircraft to return the laser beam. Slant range and azimuth and elevation angles were recorded as for EAIR. The laser tracker generally provided the more accurate tracking data at distances of 5 nmi or less from the GPI, and at these distances is preferred to EAIR data. Parallax corrections for MLS antenna and retroreflector locations were not made because of their relatively close proximity.

TEST LOCATION.

All procedure development and data collection flights were flown to and from runway 13/31 at the Atlantic City International Airport (ACY), which is located on the grounds of the FAA Technical Center, Egg Harbor Township, New Jersey.

PROCEDURE DEVELOPMENT AND EVALUATION

The procedures for this flight test series were developed by Mr. John Ryan, ACT-630, FAA Technical Center, and personnel from the Standards Development Branch, AVN-210, located at the FAA Aeronautical Center, Oklahoma City, OK. AVN-210 personnel were at the Technical Center during the procedure evaluation flights using N-40. The procedure evaluation flights were flown by Technical Center pilots to and from runway 13/31. Approach angles up to 5° were flown before the final determinations were made. After considering a number of factors including safety, minimum power settings to operate deicing equipment, and approaches during tailwinds, it was determined that the maximum operational elevation angle (MOEA) would be 4°. Since the shallowest approach angle would be 3°, it was obvious that the midpoint elevation angle should be 3.5°. At the
Master Floppy Disc Drive

Slave Floppy Disc Drive

Tektronix Ruggedized Graphics Terminal

NORDEN PDP11/34M
Mini Computer
32K Words Memory
Floating Point Arithmetic Hardware
Floppy Disc Controller
RS232 Serial Interface
Real Time Clock

Aircraft Systems Coupler

Aircraft Signals
Analog
Syncro/Resolver
Serial Digital
Discretes
Kennedy 9-Track Digital Recorder

FIGURE 1. AIRBORNE DATA COLLECTION SYSTEM
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Units</th>
<th>Resolution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>Hours, minutes, seconds, 1/10 second</td>
<td>0.1 sec</td>
</tr>
<tr>
<td>True airspeed (TAS)</td>
<td>Knots</td>
<td>1.0 knot</td>
</tr>
<tr>
<td>Vertical velocity</td>
<td>Feet/minute</td>
<td>20 ft/min</td>
</tr>
<tr>
<td>Aircraft heading</td>
<td>Degrees</td>
<td>1°</td>
</tr>
<tr>
<td>Barometric altitude (29.92)</td>
<td>Feet</td>
<td>1 foot</td>
</tr>
<tr>
<td>Radio altitude</td>
<td>Feet</td>
<td>1 foot</td>
</tr>
<tr>
<td>Vertical deviation (flight technical error (FTE))</td>
<td>Crosspointer deviation in millivolts (mV)</td>
<td>0.5 mV</td>
</tr>
<tr>
<td>Lateral deviation (FTE)</td>
<td>Crosspointer deviation (mV)</td>
<td>0.5 mV</td>
</tr>
<tr>
<td>MLS azimuth</td>
<td>Degrees</td>
<td>0.005°</td>
</tr>
<tr>
<td>MLS elevation</td>
<td>Degrees</td>
<td>0.005°</td>
</tr>
<tr>
<td>PDME</td>
<td>Nautical miles (nmi)</td>
<td>0.01 nmi</td>
</tr>
<tr>
<td>Pitch angle</td>
<td>Degrees</td>
<td>0.02°</td>
</tr>
<tr>
<td>Roll angle</td>
<td>Degrees</td>
<td>0.02°</td>
</tr>
</tbody>
</table>
same time, two departure procedures were evaluated. They will be discussed in the B-727 "Departures Data Report."

OPERATIONAL PROCEDURES

SUBJECT PILOT SELECTION.

The subject pilots for this flight test program were taken from the ranks of commercial airline pilots, except one who was an FAA aircraft certification pilot. In all, 20 subject pilots were used, with 17 completing the full set of runs, and 3 completing only a portion of the runs. All pilots were qualified B-727 captains, and had no previous experience flying MLS procedures.

SUBJECT PILOT BRIEFING.

When a subject pilot arrived at the Technical Center, he received a thorough briefing by one of the project safety pilots. Included in the briefing was an explanation of the operation of MLS, a review of aircraft operating procedures, and a review of the procedures to be flown. A sample of the information packet given to each subject is in appendix A.

DATA COLLECTION FLIGHTS.

In addition to the subject and safety pilots, each flight had a test conductor and a data collection technician on board. The test conductor recorded event mark times and other observations on a flight log (see appendix B), operated the MLS receiver control head, and ensured that the test flight was conducted according to plan. The data collection technician operated the data collection system and monitored all project equipment. The project safety pilot handled all communication with air traffic control (ATC) and the tracking facilities, monitored the subject pilot for safe operation of the aircraft, and operated the vision restricting goggles.

Instead of conventional vision restricting goggles or a hood, an electronically controlled set of instrument meteorological condition (IMC) simulation goggles were used. These goggles have the ability of simulating runway visual range (RVR) of 0 to 1 mile. They can also be instantly cleared to simulate breaking out of clouds. The goggles have a sensing switch that allows a portion of the goggles to be clear while the subject pilot is looking at the instruments, but causes the goggles to completely fog over if the subject lifts his head to look out of the cockpit. Since the goggles were operated by the safety pilot, the chances of cheating were reduced, and a more natural flight environment was presented. Therefore, the subject pilot was able to concentrate on flying the aircraft and not have to worry about removing a hood at decision height (DH). During the approach, the visibility was set to zero. When the subject pilot reached DH, the safety pilot simply cleared the glasses for a landing or kept them fogged for a missed approach. This was important since the subject pilot did not know if the procedure would terminate in a landing or a missed approach until reaching DH.
Each subject pilot flew 15 approaches. Nine resulted in missed approaches and six were flown to landing. In addition, six departures were flown and will be discussed in the B-727 Departures Data Report. The sequence of runs is listed in table 2.

<table>
<thead>
<tr>
<th>Session 1</th>
<th>Session 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Shuttle departure</td>
<td>11. Course reversal departure</td>
</tr>
<tr>
<td>2. 3° Missed approach</td>
<td>12. 4° Missed approach</td>
</tr>
<tr>
<td>3. 3.5° Missed approach</td>
<td>13. 3° Missed approach</td>
</tr>
<tr>
<td>4. 3° CAT-II Missed approach</td>
<td>14. 3.5° Missed approach</td>
</tr>
<tr>
<td>5. 4° Landing</td>
<td>15. 3° CAT-II Landing</td>
</tr>
<tr>
<td>7. 3.5° Missed approach</td>
<td>17. 3° Missed approach</td>
</tr>
<tr>
<td>8. 4° Missed approach</td>
<td>18. 4° Missed approach</td>
</tr>
<tr>
<td>9. 3° CAT-II Missed approach</td>
<td>19. 3° CAT-II Missed approach</td>
</tr>
<tr>
<td>10. Shuttle departure</td>
<td>20. 3.5° Landing</td>
</tr>
</tbody>
</table>

DATA PROCESSING

FLIGHT TEST DATA.

Flight test data came from four sources: an airborne data tape, an EAIR tracking tape, a laser tracking tape, and observer flight logs. The airborne tape contained the aircraft parameters collected on board the aircraft during the data collection flights (table 1). The EAIR and Laser tracking tapes contained tracking data that had been converted from slant range, azimuth, and elevation to X, Y, and Z coordinates using the Technical Center coordinate system. During processing the origin of the tracking data was translated to the appropriate GPI for each glidescope angle. The observer flight logs contained the times for specific events during the procedures and any other pertinent information about the flight.

SUBJECT PILOT QUESTIONNAIRES.

At the conclusion of the second flight session, the subject pilot was given a questionnaire to fill out (see appendix C). These questionnaires asked the pilot his opinions on the flyability of each procedure. The completed questionnaires were forwarded to AVN-210 for tabulation and analysis.

PLAN AND PROFILE VALIDITY PLOTS.

For each approach, plan and profile view validity plots were generated (see appendix D). These plots depict vertical and lateral aircraft position and the corresponding azimuth and elevation crosspointer deviations, with respect to the intended path. The plots determined which runs contained valid data. Runs that had bad tracking data were incorrectly flown due to ATC instructions, or
were invalid for other reasons were eliminated from the statistics pool. The total number of runs flown and the number that were usable are shown in table 3.

MERGE.

In order to process data that came from three different sources, it was necessary to merge the data from the airborne, EAIR, and laser tapes into one file. When recorded, each record on each tape had been tagged with synchronized time. Thus, it was possible to merge the data from the three different tapes into one data file. The time on the airborne tape was considered the "master," and the data from the tracking tapes were aligned with the data from the airborne tape. A mode flag was created for each merged data file to indicate which tracking data sets were valid. Tracking data were considered invalid only if there were no data with the proper time tag.

TABLE 3. LIST OF USABLE RUNS

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Number of Pilots:</td>
<td>20</td>
</tr>
<tr>
<td>Total Number of Approaches:</td>
<td>303</td>
</tr>
<tr>
<td>Number of Missed Approaches and Landings Providing Usable Data:</td>
<td>291</td>
</tr>
<tr>
<td>Number of Missed Approaches Providing Usable Data:</td>
<td></td>
</tr>
<tr>
<td>3° Missed Approaches:</td>
<td>54</td>
</tr>
<tr>
<td>3° CAT-II Missed Approaches:</td>
<td>54</td>
</tr>
<tr>
<td>3.5° Missed Approaches:</td>
<td>56</td>
</tr>
<tr>
<td>4° Missed Approaches:</td>
<td>55</td>
</tr>
<tr>
<td>Total</td>
<td>219</td>
</tr>
<tr>
<td>Number of Landings Providing Usable Data:</td>
<td></td>
</tr>
<tr>
<td>3° Landings:</td>
<td>18</td>
</tr>
<tr>
<td>3° CAT-II Landings:</td>
<td>18</td>
</tr>
<tr>
<td>3.5° Landings:</td>
<td>18</td>
</tr>
<tr>
<td>4° Landings:</td>
<td>18</td>
</tr>
<tr>
<td>Total</td>
<td>72</td>
</tr>
</tbody>
</table>

FILL.

Occasionally, gaps were present in both the airborne and tracking data. To provide as continuous a string of data as possible, two methods were used to fill in these gaps. If the gap consisted of only one missing record, linear interpolation was used to calculate the missing data. If the gap was between 2 and 20 records long, a least-squares, quadratic polynomial curve fitting routine was used. If the gap was greater than 20 records, the gap was too long for the filling routines and was left in the data base.

DATA PARTITIONING.

In order to compute the required statistics, it was necessary to partition, or bin, the data horizontally (perpendicular to the intended flight path) and vertically (parallel to the ground). For horizontal bins, the first bin (bin zero) is located along the system x-axis (runway centerline) at the point where a line dropped from the theoretical threshold crossing height (TCH), which is 50 feet above ground level (AGL), intersects the X-axis. Each subsequent bin was located at 50-meter intervals, with positive bins located on the approach
side of bin zero and negative bins located on the landing, or missed, approach side of bin zero. Additional bins were located at the following points:

1. Intermediate approach fix
2. Final approach fix
3. Missed approach point (DH)
4. Missed approach boundary

Vertical partitions were established for missed approach segments. The vertical bins were located at 10-meter intervals AGL while below DH (100 or 200 feet), and at 25-meter intervals AGL above DH to 2000 feet AGL.

STATISTICS.

Statistical calculations were performed on the data in each bin. The parameters calculated are in table 4.

To aid in the calculations for skewness and kurtosis, the first 4 moments about zero were calculated. The equations used to calculate the standard statistics and first 4 moments about zero are shown in table 5.

TABLE 4. STANDARD STATISTICS.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of data points</td>
<td>N</td>
</tr>
<tr>
<td>Arithmetic mean</td>
<td>( \bar{X} )</td>
</tr>
<tr>
<td>Maximum value</td>
<td>( X_{\text{max}} )</td>
</tr>
<tr>
<td>Minimum value</td>
<td>( X_{\text{min}} )</td>
</tr>
<tr>
<td>Unbiased estimate of variance</td>
<td>( S_u^2 )</td>
</tr>
<tr>
<td>Biased estimate of variance</td>
<td>( S_b^2 )</td>
</tr>
<tr>
<td>Unbiased estimate of standard deviation</td>
<td>( S_u )</td>
</tr>
<tr>
<td>Biased estimate of standard deviation</td>
<td>( S_b )</td>
</tr>
<tr>
<td>Skewness</td>
<td>( b_1 )</td>
</tr>
<tr>
<td>Kurtosis</td>
<td>( b_2 )</td>
</tr>
</tbody>
</table>

RESULTS

STATISTICS PRINTOUTS AND TAPES.

The statistical data were delivered to AVN-210 in two different formats. A set of summary statistics and the minima analysis were printed to allow a quick overview of the statistical data. The full set of statistical data was recorded on magnetic tapes due to the extensive volume of paper that would be needed to print the complete set. Examples of the summary statistics printouts are provided in appendix E. The complete set of minima analysis printouts are provided in appendix F. The parameters for which statistics were calculated are listed by segment in tables 6, 7, and 8. The parameters for the minima analysis are listed in table 9.
TABLE 5. STANDARD STATISTICS EQUATIONS

Arithmetic Mean (first moment about zero): \( \bar{x} = M_1 = \frac{\sum x}{N} \)

Second Moment About Zero: \( M_2 = \frac{\sum x^2}{N} \)

Third Moment About Zero: \( M_3 = \frac{\sum x^3}{N} \)

Fourth Moment About Zero: \( M_4 = \frac{\sum x^4}{N} \)

Biased Estimate of Variance: \( S_b^2 = M_2 - M_1^2 \)

Unbiased Estimate of Variance: \( S_u^2 = \frac{(S_b^2) N}{N-1} \)

Biased Estimate of Standard Deviation: \( S_b = \sqrt{M_2 - M_1^2} \)

Unbiased Estimate of Standard Deviation: \( S_u = \sqrt{\frac{(S_b^2) N}{N-1}} \)

Skewness: \( b_1 = \frac{M_3 - 3M_1M_2 + 2M_1^3}{(M_2 - M_1^2)^{1.5}} \)

Kurtosis: \( b_2 = \frac{M_4 - 4M_1M_3 + 6M_1^2M_2 - 3M_1^4}{(M_2 - M_1^2)^2} \)
<table>
<thead>
<tr>
<th>Parameters for Statistics</th>
<th>Intermediate</th>
<th>Final</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crosstrack Position (feet)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Altitude (feet)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Azimuth TSE (degrees)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Azimuth TSE (feet)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Azimuth FTE (degrees)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Azimuth FTE (feet)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Azimuth FTE (% full scale)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Azimuth NSE (degrees)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Azimuth NSE (feet)</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Elevation TSE (degrees)</td>
<td>-</td>
<td>Yes</td>
</tr>
<tr>
<td>Elevation TSE (feet)</td>
<td>-</td>
<td>Yes</td>
</tr>
<tr>
<td>Elevation FTE (degrees)</td>
<td>-</td>
<td>Yes</td>
</tr>
<tr>
<td>Elevation FTE (feet)</td>
<td>-</td>
<td>Yes</td>
</tr>
<tr>
<td>Elevation FTE (% full scale)</td>
<td>-</td>
<td>Yes</td>
</tr>
<tr>
<td>Elevation NSE (degrees)</td>
<td>-</td>
<td>Yes</td>
</tr>
<tr>
<td>Elevation NSE (feet)</td>
<td>-</td>
<td>Yes</td>
</tr>
</tbody>
</table>

*TSE = Total System Error  
NSE = Navigation System Error*
TABLE 7. PARAMETERS FOR STATISTICAL CALCULATIONS:
MISSED APPROACH SEGMENT LONGITUDINAL BINS

1. Crosstrack position (feet)
2. Altitude (feet)

TABLE 8. PARAMETERS FOR STATISTICAL CALCULATIONS:
MISSED APPROACH SEGMENT VERTICAL BINS

1. Along track position (feet)
2. Altitude (feet)

TABLE 9. PARAMETERS FOR STATISTICAL CALCULATIONS:
MISSED APPROACH SEGMENT MINIMA ANALYSIS

1. Altitude at DH (feet)
2. Along track deviation at DH (feet)
3. Crosstrack deviation at DH (feet)
4. Along track deviation at lowest altitude (feet)
5. Crosstrack deviation at lowest altitude (feet)
6. Lowest altitude (feet)
7. Height loss (feet)
8. Radio altimeter at DH (200 ft AGL (tracker))
9. Baro altimeter at DH (200 ft AGL (tracker))
10. Radio altimeter at lowest altitude
11. Baro altimeter at lowest altitude
COMPOSITE PLOTS.

To see how the subject pilots performed as a group, composite plots of each type of approach were produced and are shown in appendix G. These plots are an overlay of each of the individual plan and profile view validity plots and provide an indication of how much airspace needs to be protected for a particular procedure.

ISOPROBABILITY PLOTS.

A graphical presentation of the computed statistics was performed by the plotting of +6 standard deviation isoprobability plots. The complete set of isoprobability plots is included in appendix H. Some of the final approach segment plots have a spike at 2 nmi from the GPI. This was caused by the switchover from EAIR to laser tracker at this point. This particular bin used both tracker's data to interpolate to this bin, which caused a larger than normal dispersion of data points than in the other bins. This caused a small deflection in plotting the mean, but was exaggerated by the effects of plotting +6 standard deviations.

LANDING SEGMENT SCATTER PLOTS.

Due to the relatively small number of landings performed during this flight test series, no statistical analysis was done on the landing segment data. However, landing segment scatter plots with a 95 percent error ellipse on each plot were generated for both horizontal and vertical bins. Samples of the landing segment scatter plots are shown in appendix I.

DELIVERIES.

The following plots and processed data were shipped to AVN-210 on January 15, 1987:

1. All validity plots for missed approaches and landings.
2. All isoprobability plots for missed approaches and landings.
3. All composite plots for missed approaches and landings.
4. All summary statistics printouts for missed approaches and landings.
5. All minima analysis printouts for missed approaches.
6. Complete standard statistics on magnetic tapes for missed approaches and landings.
7. All landing segment scatter plots with 95% error ellipses.

The archival tapes will be delivered to AVN-210 after the approach data processing for all aircraft being flown at the Technical Center is completed.
APPENDIX A

SUBJECT PILOT INFORMATION PACKAGE
Project: Fixed Wing MLS Steep Angle Approaches for TERPS, 70603F

Task: MLS Steep Angle Approach Data Collection

Sponsor: FAA Navigation and Landing Branch, AM-410

Monitor: FAA Standards Development Branch, Aviation Standards National Field Office, AVH-210

Objective:

To provide flight data suitable for procedures specialists to develop criteria for MLS guided approaches and departures for heavy jet aircraft, and update Terminal Instrument Procedures (TERPS) for fixed wing aircraft.

Operational Areas Include

1. MLS Precision Approaches
2. Normal and Steep (30° and greater) Approach Gradients
3. Height Loss at Missed Approach Point
4. MLS Azimuth Departures

Technical Issues

1. Pilot Workload
2. Aircraft Performance Limitations

Location

Federal Aviation Administration Technical Center
Atlantic City Airport, NJ 08405

Project Personnel

1. Mr. Bob Pursel, Manager
   Guidance & Airborne Systems Branch, ACT-140
   (609) 484-6918

2. Mr. Ed Zyzys, Technical Program Manager
   MLS Fixed Wing TERPS Flight Tests, ACT-140
   (609) 484-5707

3. Mr. Ed Pugacz, Project Manager
   MLS Fixed Wing TERPS Flight Tests, ACT-140
   (609) 484-5707

4. Mr. John Ryan, Project Pilot
   Flight Test Pilot, ACT-631
   (609) 484-6466

5. Mr. David F. Reuter, Project Engineer
   MLS Fixed Wing Flight Test, ACT-140
   (609) 484-4614
ATTACHMENT #1

VOLUNTARY FAA EMPLOYEE

Background

In order to cover our legal obligations to you during your participation in this project, you will be required to complete a request for personnel action. Completion of said form will make you a WITHOUT COMPENSATION VOLUNTEER EMPLOYEE with the FAA Guidance and Airborne Systems Branch, ACT-140, Atlantic City, NJ without compensation during the term of involvement in this project, which is scheduled to be 3 days.

Employee Status

A WITHOUT COMPENSATION VOLUNTEER is NOT a Federal employee for any purposes other than injury compensation or laws related to the Torts Claims Act. Service is NOT creditable for leave accrual or any other employee benefits; however, travel orders will be issued to you, and thereby, provide a method to reimburse you for travel expenses as described in attachment #2.

Employee Duties

During your involvement in this project you will perform the duties of pilot for a Boeing 727 aircraft, including preflight planning, aircraft control, navigation, and communication. You will be assigned to perform the technical inflight evaluation of various guidance and airborne systems. You will normally be assigned to work between the hours of 8:00 am to 4:30 pm, however, not to exceed 8 hours in any day. You will be the pilot of the aircraft, however, the project pilot will be pilot-in-command at ALL times.

Qualifications

You will be required to meet the following minimum qualifications to participate in this project:

2. Hold a valid FAA Medical Certificate.
3. Meet the recent flight experience as required by FAR 61.58.

Termination

Upon the expiration of the assignment your employment will be terminated with no further obligation to either party.
ATTACHMENT #2

TRAVEL EXPENSES

You will be reimbursed for normal travel expenses incurred while participating in this project. A U.S. Government travel voucher, Standard Form 1012, has been provided for you to record expenses and submit upon the completion of your participation in the program. The following is a list of important information to keep in mind while on government reimbursed travel.

1. Mileage for actual miles driven in your own car is reimbursed at 20.5¢ per mile.

2. Air travel (if necessary) should be via coach class, and at a discount or excursion fare, if available.

3. By Federal Law, the MAXIMUM ALLOWABLE AMOUNT you can be reimbursed for lodging and meals during any one day is $126.00. Of that amount, $33.00 is a flat reimbursement for meals and incidental expenses, except for the first day of travel, which is limited to $16.50. The remainder, $93.00, is a maximum amount reimbursable for lodging. All other reasonable expenses (car rental, airline tickets, tolls, etc.) are reimbursed at full rate.

4. All receipts for airline tickets, lodging, taxis, and tolls must be remitted with your travel voucher. Receipts for meals are not required.

5. Upon completion of the form, mail to the following address in the postage paid envelope provided for your convenience.

Edward Pugacz
FAA Technical Center
ACT-140
Atlantic City Airport, NJ 08405
ATTACHMENT #3

HOW TO FIND THE FAA TECHNICAL CENTER

- Take the ATLANTIC CITY EXPRESSWAY to EXIT 7S which is the GARDEN STATE PARKWAY.

- Take the GARDEN STATE PARKWAY to EXIT 37.

- Turn right and proceed approximately 1/4 mile to the first traffic circle, KEEP RIGHT and take the FIRST EXIT off the circle (ROUTE 563).

- Continue on ROUTE 563 (approximately 1 1/2 miles) to the traffic circle. Again keep right and the TECHNICAL CENTER entrance is the second exit off the circle.

- Proceed to the main gate and indicate that you have an appointment with Jim Enias, ACT-140, Building 301 (Hangar). Parking is across the road from the hangar.

- Once at the hangar, proceed across the hangar floor to the elevator and we are on the THIRD FLOOR, ROOM 305B.

HOW TO FIND THE PIER 4 HOTEL

- Take the GARDEN STATE PARKWAY to EXIT 30.

- When you leave the toll booth proceed straight ahead approximately 3/4 mile to the STOP sign. Proceed straight across that intersection to the Somers Point Circle. The PIER 4 will be directly off your right.

- Telephone (609) 927-9141

PIER 4 TO TECHNICAL CENTER

- Proceed back to the GARDEN STATE PARKWAY.

- Take the GARDEN STATE PARKWAY NORTH to EXIT 36.

- After you exit the Parkway TURN LEFT onto Route 563 and proceed under the Parkway to the first traffic light (approximately 1/4 mile) and TURN LEFT and follows the Route 563 signs.

- Proceed approximately 1/2 mile to the traffic circle, KEEP RIGHT and take the SECOND EXIT off the circle (Route 563).

- Continue on Route 563 (approximately 1 1/2 miles) to the traffic circle. Again keep right and the TECHNICAL CENTER entrance is the second exit off the circle.

- Proceed to the main gate and indicate that you have an appointment with Jim Enias, ACT-140, Building 301 (Hangar). Parking is across the road from the hangar.

- Once at the hangar, proceed across the hangar floor to the elevator and we are on the THIRD FLOOR, ROOM 305B.
ADMINISTRATIVE INFORMATION

NAME (Last, First, Middle)

Street address or RFD no. (include apartment no., if any)

City                      State                  Zip Code

Birth Date                Social Security Number

Position and Current Employer

Work Phone

Flying Experience:

Military Experience:

Civilian Experience:

Other Flying Affiliates:
BOEING 727 MLS FLIGHT TEST PROGRAM

OPERATIONAL PILOT QUALIFICATIONS

NAME: ____________________________________________

AFFILIATION: ______________________________________

ADDRESS: _________________________________________

CITY: ___________________________ STATE: ___________ ZIP: ______

PHONE: ________________________________

FAA RATINGS: (Private, Comm, ATP, ETC)

TOTAL FLIGHT HOURS: ________________________________

TOTAL BOEING 727 HOURS: _____________________________

ACTUAL IFR HOURS: ________________________________

HOODED IFR HOURS: ________________________________

PERIOD OF FAA FLIGHT TEST (week of): ____________________________
Missed Approach: Climb Heading 308° to 2000 feet for radar vectors.

- MLS Test VFR only

Category II MLS-Special Aircrew and Aircraft Certification Required
Missed Approach: Climb Heading 308° to 2000 feet for radar vectors.

M-ACY 7.0 DME
M-ACY 2.1 DME
MLS 00° 2300
GS 4.0°

Category: A B C D E
S-MLS 31 264 200 (200-½)

MLS TEST VFR ONLY

39°27'N - 74°35'W

Atlantic City, New Jersey

A-10
**ATLANTIC CITY (ACY)**

**ATLANTIC CITY, NEW JERSEY**

---

**MLS SHUTTLE DEPARTURE (PILOT NAY)**

- ATLANTIC CITY APP CON: 121.8 388.3
- ATLANTIC CITY TOWER: 120.30
- GND CON: 121.8 388.3
- CINC DEL: 127.90
- AIS: 108.6

---

**MICROWAVE**

- CHAN 630
- M-ACY:
- 117.10 PDME

---

**ATLANTIC CITY**

- 108.6 ACI

---

**TAKE-OFF RUNWAY 13**: Depart runway heading 128° and track outbound on the M-ACY 00° Azimuth, climb to 2000 feet before reaching the 6.0 PDME, maintain altitude or continue climb to assigned altitude. At the 5.0 PDME turn left to a heading of 078° and intercept the R20° Azimuth outbound, at the 15.5 PDME hold as depicted or proceed inbound on the 00° Azimuth as directed by ATC.

**Note**: Holding Airspeed 230 Knots; Inside Turn Bank Angle 20°; Outside Turn Bank Angle 16° in a no wind condition.

---

**ELEV 76**

---

**39°27'N - 74°35'W**

---

A-11
TAKE-OFF RUNWAY 13: Depart runway heading 128° and track outbound on the M-ACY 00° Azimuth, climb to 2000 feet or as assigned. At the 10.0 PDE turn left 80°, upon completing the turn, turn right 260° to intercept the 00° Azimuth and track inbound. At no time during the maneuver exceed the R19° Azimuth or the 17.0 PDE, adjust turn rate as necessary.

Note: Maneuver Airspeed 230 Knots; Minimum Turn Bank Angle is 20° in a No Wind Condition.
<table>
<thead>
<tr>
<th>Run</th>
<th>Type</th>
<th>Event Time</th>
<th>Code</th>
<th>Event Time</th>
<th>Code</th>
<th>Event Time</th>
<th>Code</th>
<th>Winds &amp; Baro</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3°</td>
<td>10 13</td>
<td>13</td>
<td>10 13</td>
<td>13</td>
<td>10 13</td>
<td>13</td>
<td>GS @ 7 3 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>2</td>
<td>3°</td>
<td>10 17</td>
<td>13</td>
<td>10 17</td>
<td>13</td>
<td>10 17</td>
<td>13</td>
<td>GS @ 7 3 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>3</td>
<td>3°</td>
<td>10 21</td>
<td>13</td>
<td>10 21</td>
<td>13</td>
<td>10 21</td>
<td>13</td>
<td>GS @ 7 3 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>4</td>
<td>4°</td>
<td>10 25</td>
<td>14</td>
<td>10 25</td>
<td>14</td>
<td>10 25</td>
<td>14</td>
<td>GS @ 7 0 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>5</td>
<td>3°</td>
<td>10 31</td>
<td>13</td>
<td>10 31</td>
<td>13</td>
<td>10 31</td>
<td>13</td>
<td>GS @ 7 3 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>6</td>
<td>3°</td>
<td>10 38</td>
<td>13</td>
<td>10 38</td>
<td>13</td>
<td>10 38</td>
<td>13</td>
<td>GS @ 7 0 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>7</td>
<td>4°</td>
<td>10 47</td>
<td>13</td>
<td>10 47</td>
<td>13</td>
<td>10 47</td>
<td>13</td>
<td>GS @ 7 3 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>8</td>
<td>3°</td>
<td>10 50</td>
<td>14</td>
<td>10 50</td>
<td>14</td>
<td>10 50</td>
<td>14</td>
<td>GS @ 7 3 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>9</td>
<td>3°</td>
<td>10 55</td>
<td>14</td>
<td>10 55</td>
<td>14</td>
<td>10 55</td>
<td>14</td>
<td>GS @ 7 3 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>10</td>
<td>3°</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>12</td>
<td>11</td>
<td>12</td>
<td>GS @ 7 3 DME</td>
<td>N. ON FINAL</td>
</tr>
<tr>
<td>Run #</td>
<td>Type</td>
<td>Event</td>
<td>Event</td>
<td>Event</td>
<td>Event</td>
<td>Winds</td>
<td>Comments</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>--------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>-------</td>
<td>----------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Course Reversal</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>16</td>
<td>GS@7.0 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>4°</td>
<td>4</td>
<td>10</td>
<td>7</td>
<td>13</td>
<td>GS@7.3 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>3°</td>
<td>8</td>
<td>10</td>
<td>11</td>
<td>13</td>
<td>GS@7.3 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>3.5°</td>
<td>12</td>
<td>10</td>
<td>15</td>
<td>13</td>
<td>GS@7.3 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Cat II</td>
<td>16</td>
<td>10</td>
<td>19</td>
<td>14</td>
<td>GS@7.3 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>Shuttle Departure</td>
<td>20</td>
<td>1</td>
<td>23</td>
<td>4</td>
<td>GS@7.3 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>3°</td>
<td>29</td>
<td>10</td>
<td>32</td>
<td>13</td>
<td>GS@7.3 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>4°</td>
<td>23</td>
<td>10</td>
<td>34</td>
<td>13</td>
<td>GS@7.0 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19</td>
<td>Cat II</td>
<td>37</td>
<td>10</td>
<td>40</td>
<td>13</td>
<td>GS@7.3 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>3.5°</td>
<td>41</td>
<td>10</td>
<td>49</td>
<td>14</td>
<td>GS@7.3 DME</td>
<td>N on Final</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C

SUBJECT PILOT QUESTIONNAIRE
Pilot Questionnaire

Steep Angle Approach

Date ___________ Pilot ___________

EL Angle ___________ Wind D/V ___________

All questions relate to IMC MLS operational performance.

1. Was the EL angle:
   - Too shallow 1 2 3
   - About Right 4
   - Too steep 5 6 7

2. Could the EL angle be steeper? 1 yes 2 no

3. Indicate the difficulty experienced in intercepting and maintaining
   the glide path angle.
   - Very easy 1
   - About Right 2
   - Very difficult 3

4. Indicate the difficulty experienced in keeping the AZ needle centered in
   relation to the EL angle being used.
   - Very easy 1
   - About Right 2
   - Very difficult 3

5. Indicate your assessment of the stabilized power setting relative to
   operational procedures.
   - Too low 1 2 3
   - About Right 4
   - Too High 5 6 7

6. Compare the difficulty of visual transition and landing from a ________
   angle to a normal 3 degree ILS:
   - Much less 1 2 3
   - Same 4
   - Much More 5 6 7
7. Compare the workload of a GS to a normal 3 degree ILS.

<table>
<thead>
<tr>
<th>Much Less</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>Same</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Much More</th>
</tr>
</thead>
</table>

8. Was the GS intercept distance from DH:

<table>
<thead>
<tr>
<th>Too Short</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>About Right</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>Too Long</th>
</tr>
</thead>
</table>

9. What is your recommendation for the maximum allowable rate of descent:

_________________ fpm.

10. What is your recommendation for a minimum at DH?

| 100 | 150 | 200 | 250 | 300 | Other |

11. Was this DH satisfactory for the execution of a missed approach? _________
APPENDIX D

SAMPLE VALIDITY PLOTS
N-40 PILOTS: KREITZBERG/RYAN DATE: 3/3/86

INPUT FILE: MFB009. RUN NUMBER > 10
RUN START: 15:45:28... RUN STOP: 15:48:48
3 DEG LAND
LASER FAIR
N-40 PILOTS: KREITZBERG, RYAN DATE: 3/4/86

INPUT FILE: MFB010.. RUN NUMBER >15
RUN START.>10: 0: 2.. RUN STOP.>10: 3: 9
3 DEG-CAT II LAND
INPUT FILE: MFB010
RUN NUMBER: 15
RUN START: 10:02
RUN STOP: 10:09
3 DEG-CAT II LAND
LASER: FAIR
N-40 PILOTS: KREITZBERG, RYAN DATE: 3/4/86

INPUT FILE: MFB010. RUN NUMBER: 15
RUN START: 10: 0: 2. RUN STOP: 10: 3: 9
3 DEC-CAT 11 LAND
N-40 PILOTS: APPLEGATE, JERRY DATE: 4/7/86
INPUT FILE: >MFB023.. RUN NUMBER > 7
RUN START. >15:25; 8.. RUN STOP. >15:31:42
3.5 DEG MAP
LASER FAIR
N-40 PILOTS: APPLEGATE, TERRY DATE: 4/8/86
INPUT FILE: MFB024, RUN NUMBER: 18
RUN START: 10:48:27, RUN STOP: 10:53:37
4 DEG MAP

AZIMUTH DEVIATION (UA) -5.00 -5.00
5.00 5.00
15.00
25.00

ALONG RUNWAY DISTANCE (NMI)

-5.00 -3.00 -1.00 1.00 3.00 5.00 7.00 9.00 11.00 13.00 1
N-40 PILOTS: APPLEGATE, TERRY DATE: 4/7/86

INPUT FILE: MFBO23, RUN NUMBER > 5
RUN START: 15: 1: 4, RUN STOP: 15: 4: 56
4 DEG LAND
LASER EAIR
N-40 PILOTS, APPLEGATE. TERRY DATE: 4/7/86

INPUT FILE: MFB023. RUN NUMBER: 5
4 DEG LAND

AZIMUTH DEVIATION (UA) 10^1
5.00
-5.00
-15.00
-25.00

ALONG RUNWAY DISTANCE (NMI)
5.00
-3.00
-1.00
1.00
3.00
5.00
7.00
9.00
11.00
13.00
15
APPENDIX E

SAMPLE SUMMARY STATISTICS
### 3-727 3.0 DEGREE MLS APPROACH

**COMPOSITE DATA FILE  DU2CF521A.CSL**

**DECISION HEIGHT  200 FT**

**STANDARD STATISTICS SUMMARY**

---

**LONGITUDINAL BINS FOR INITIAL APPROACH SEGMENT**

**AZIMUTH TOTAL SYSTEM ERROR (DEG)**

---

**DATA COLLECTED AND PROCESSED AT:**

**THE FAA TECHNICAL CENTER**

**ATLANTIC CITY AIRPORT, NJ 08405**

---

<table>
<thead>
<tr>
<th>FEET FROM POINTS</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>SKUENNESS</th>
<th>KURTOSIS</th>
<th>BIN #</th>
</tr>
</thead>
<tbody>
<tr>
<td>THETA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>63096.56</td>
<td>-0.014</td>
<td>0.396</td>
<td>-0.099</td>
<td>2.270</td>
<td>499</td>
</tr>
<tr>
<td>63053.39</td>
<td>0.148</td>
<td>0.753</td>
<td>2.126</td>
<td>7.998</td>
<td>498</td>
</tr>
<tr>
<td>62889.35</td>
<td>0.126</td>
<td>0.700</td>
<td>2.226</td>
<td>8.812</td>
<td>497</td>
</tr>
<tr>
<td>62725.31</td>
<td>0.119</td>
<td>0.690</td>
<td>2.156</td>
<td>8.543</td>
<td>496</td>
</tr>
<tr>
<td>62561.27</td>
<td>0.329</td>
<td>1.159</td>
<td>2.433</td>
<td>8.482</td>
<td>495</td>
</tr>
<tr>
<td>62397.23</td>
<td>0.318</td>
<td>1.142</td>
<td>2.427</td>
<td>8.516</td>
<td>494</td>
</tr>
<tr>
<td>62233.18</td>
<td>0.304</td>
<td>1.125</td>
<td>2.424</td>
<td>8.564</td>
<td>493</td>
</tr>
<tr>
<td>62069.14</td>
<td>0.297</td>
<td>1.107</td>
<td>2.423</td>
<td>8.623</td>
<td>492</td>
</tr>
<tr>
<td>61905.10</td>
<td>0.287</td>
<td>1.089</td>
<td>2.424</td>
<td>8.691</td>
<td>491</td>
</tr>
<tr>
<td>61741.06</td>
<td>0.277</td>
<td>1.071</td>
<td>2.427</td>
<td>8.771</td>
<td>490</td>
</tr>
<tr>
<td>61577.02</td>
<td>0.268</td>
<td>1.053</td>
<td>2.434</td>
<td>8.863</td>
<td>489</td>
</tr>
<tr>
<td>61412.98</td>
<td>0.258</td>
<td>1.035</td>
<td>2.442</td>
<td>8.962</td>
<td>488</td>
</tr>
<tr>
<td>61248.93</td>
<td>0.248</td>
<td>1.017</td>
<td>2.450</td>
<td>9.063</td>
<td>487</td>
</tr>
<tr>
<td>61084.89</td>
<td>0.239</td>
<td>0.999</td>
<td>2.460</td>
<td>9.167</td>
<td>486</td>
</tr>
<tr>
<td>60920.85</td>
<td>0.229</td>
<td>0.932</td>
<td>2.472</td>
<td>9.280</td>
<td>485</td>
</tr>
<tr>
<td>60756.81</td>
<td>0.220</td>
<td>0.965</td>
<td>2.436</td>
<td>9.405</td>
<td>484</td>
</tr>
<tr>
<td>60592.77</td>
<td>0.211</td>
<td>0.996</td>
<td>2.460</td>
<td>9.561</td>
<td>483</td>
</tr>
<tr>
<td>60428.72</td>
<td>0.039</td>
<td>0.481</td>
<td>2.709</td>
<td>3.974</td>
<td>452</td>
</tr>
<tr>
<td>60254.68</td>
<td>0.032</td>
<td>0.466</td>
<td>0.628</td>
<td>3.653</td>
<td>481</td>
</tr>
</tbody>
</table>
### 9-727 3.0 DEGREE MLS APPROACH

COMPOSITE DATA FILE DU2:CFB2IA.CSL

**DETECTION HEIGHT** 200 FT

**STANDARD STATISTICS SUMMARY**

**LONGITUDINAL BINS FOR INITIAL APPROACH SEGMENT**

**AZIMUTH TOTAL SYSTEM ERROR (DEG)**

---

**DATA COLLECTED AND PROCESSED AT:**

**THE FAA TECHNICAL CENTER**

**ATLANTIC CITY AIRPORT, NJ 08405**

---

**FEET FROM POINTS**

<table>
<thead>
<tr>
<th>FEET FROM POINTS</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
<th>BIN #</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>THETA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>60100.64</td>
<td>0.026</td>
<td>0.453</td>
<td>0.553</td>
<td>3.470</td>
<td>480</td>
</tr>
<tr>
<td>59936.60</td>
<td>0.189</td>
<td>0.818</td>
<td>2.701</td>
<td>11.318</td>
<td>479</td>
</tr>
<tr>
<td>59772.55</td>
<td>0.182</td>
<td>0.804</td>
<td>2.710</td>
<td>11.392</td>
<td>478</td>
</tr>
<tr>
<td>59608.51</td>
<td>0.175</td>
<td>0.791</td>
<td>2.713</td>
<td>11.438</td>
<td>477</td>
</tr>
<tr>
<td>59444.47</td>
<td>0.169</td>
<td>0.777</td>
<td>2.714</td>
<td>11.464</td>
<td>476</td>
</tr>
<tr>
<td>59230.43</td>
<td>0.162</td>
<td>0.763</td>
<td>2.713</td>
<td>11.476</td>
<td>475</td>
</tr>
<tr>
<td>59116.39</td>
<td>0.157</td>
<td>0.750</td>
<td>2.711</td>
<td>11.476</td>
<td>474</td>
</tr>
<tr>
<td>53952.34</td>
<td>0.151</td>
<td>0.736</td>
<td>2.706</td>
<td>11.458</td>
<td>473</td>
</tr>
<tr>
<td>53788.30</td>
<td>0.146</td>
<td>0.723</td>
<td>2.697</td>
<td>11.416</td>
<td>472</td>
</tr>
<tr>
<td>53624.26</td>
<td>0.140</td>
<td>0.710</td>
<td>2.683</td>
<td>11.346</td>
<td>471</td>
</tr>
<tr>
<td>58460.22</td>
<td>0.134</td>
<td>0.698</td>
<td>2.665</td>
<td>11.252</td>
<td>470</td>
</tr>
<tr>
<td>58296.18</td>
<td>0.128</td>
<td>0.686</td>
<td>2.642</td>
<td>11.136</td>
<td>469</td>
</tr>
<tr>
<td>58132.14</td>
<td>0.122</td>
<td>0.674</td>
<td>2.617</td>
<td>11.001</td>
<td>468</td>
</tr>
<tr>
<td>57968.09</td>
<td>0.116</td>
<td>0.663</td>
<td>2.588</td>
<td>10.846</td>
<td>467</td>
</tr>
<tr>
<td>57804.05</td>
<td>0.110</td>
<td>0.652</td>
<td>2.555</td>
<td>10.668</td>
<td>466</td>
</tr>
<tr>
<td>57640.01</td>
<td>0.105</td>
<td>0.641</td>
<td>2.518</td>
<td>10.463</td>
<td>465</td>
</tr>
<tr>
<td>57475.97</td>
<td>0.100</td>
<td>0.631</td>
<td>2.475</td>
<td>10.233</td>
<td>464</td>
</tr>
<tr>
<td>57311.93</td>
<td>0.094</td>
<td>0.620</td>
<td>2.429</td>
<td>9.988</td>
<td>463</td>
</tr>
<tr>
<td>57147.88</td>
<td>0.089</td>
<td>0.610</td>
<td>2.333</td>
<td>9.743</td>
<td>462</td>
</tr>
</tbody>
</table>
### Longitudinal Bins for Initial Approach Segment

**Azimuth Total System Error (Deg)**

**Data Collected and Processed At:**

*The FAA Technical Center*

*Atlantic City Airport, NJ 08405*

<table>
<thead>
<tr>
<th>Feet From Points Theta</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Bin #</th>
</tr>
</thead>
<tbody>
<tr>
<td>56983.84 22.</td>
<td>0.084</td>
<td>0.560</td>
<td>2.339</td>
<td>9.508</td>
<td>461</td>
</tr>
<tr>
<td>56819.80 22.</td>
<td>0.079</td>
<td>0.591</td>
<td>2.294</td>
<td>9.270</td>
<td>460</td>
</tr>
<tr>
<td>56655.76 22.</td>
<td>0.074</td>
<td>0.581</td>
<td>2.245</td>
<td>9.014</td>
<td>459</td>
</tr>
<tr>
<td>56491.71 22.</td>
<td>0.068</td>
<td>0.572</td>
<td>2.191</td>
<td>8.733</td>
<td>458</td>
</tr>
<tr>
<td>56327.67 22.</td>
<td>0.063</td>
<td>0.563</td>
<td>2.132</td>
<td>8.431</td>
<td>457</td>
</tr>
<tr>
<td>56163.63 22.</td>
<td>0.057</td>
<td>0.554</td>
<td>2.069</td>
<td>8.112</td>
<td>456</td>
</tr>
<tr>
<td>55999.59 22.</td>
<td>0.051</td>
<td>0.546</td>
<td>2.001</td>
<td>7.780</td>
<td>455</td>
</tr>
<tr>
<td>55835.55 22.</td>
<td>0.045</td>
<td>0.538</td>
<td>1.929</td>
<td>7.435</td>
<td>454</td>
</tr>
<tr>
<td>55671.50 22.</td>
<td>0.040</td>
<td>0.530</td>
<td>1.952</td>
<td>7.076</td>
<td>453</td>
</tr>
<tr>
<td>55507.46 22.</td>
<td>0.035</td>
<td>0.522</td>
<td>1.769</td>
<td>6.707</td>
<td>452</td>
</tr>
<tr>
<td>55343.42 23.</td>
<td>0.006</td>
<td>0.515</td>
<td>1.678</td>
<td>6.344</td>
<td>451</td>
</tr>
<tr>
<td>55179.38 23.</td>
<td>-0.002</td>
<td>0.512</td>
<td>1.532</td>
<td>5.341</td>
<td>450</td>
</tr>
<tr>
<td>55015.34 23.</td>
<td>-0.010</td>
<td>0.510</td>
<td>1.370</td>
<td>5.366</td>
<td>449</td>
</tr>
<tr>
<td>54851.30 23.</td>
<td>-0.017</td>
<td>0.509</td>
<td>1.197</td>
<td>4.939</td>
<td>448</td>
</tr>
<tr>
<td>54687.25 23.</td>
<td>-0.024</td>
<td>0.503</td>
<td>1.017</td>
<td>4.573</td>
<td>447</td>
</tr>
<tr>
<td>54523.21 23.</td>
<td>-0.032</td>
<td>0.508</td>
<td>0.833</td>
<td>4.277</td>
<td>446</td>
</tr>
<tr>
<td>54359.17 23.</td>
<td>-0.040</td>
<td>0.509</td>
<td>0.649</td>
<td>4.055</td>
<td>445</td>
</tr>
<tr>
<td>54195.13 23.</td>
<td>-0.047</td>
<td>0.510</td>
<td>0.406</td>
<td>3.912</td>
<td>444</td>
</tr>
<tr>
<td>54031.09 25.</td>
<td>-0.053</td>
<td>0.511</td>
<td>0.236</td>
<td>3.945</td>
<td>443</td>
</tr>
</tbody>
</table>
# Longitudinal Bins for Initial Approach Segment

**Azimuth Total System Error (Deg)**

**Data Collected and Processed At:**

*The FAA Technical Center*  
*Atlantic City Airport, NJ 08405*

<table>
<thead>
<tr>
<th>Feet From Points</th>
<th>Points</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Bin #</th>
</tr>
</thead>
<tbody>
<tr>
<td>53867.04</td>
<td>23.</td>
<td>-0.061</td>
<td>0.512</td>
<td>0.109</td>
<td>3.856</td>
<td>442</td>
</tr>
<tr>
<td>53703.00</td>
<td>23.</td>
<td>-0.067</td>
<td>0.514</td>
<td>-0.066</td>
<td>3.937</td>
<td>441</td>
</tr>
<tr>
<td>53538.96</td>
<td>23.</td>
<td>-0.071</td>
<td>0.515</td>
<td>-0.235</td>
<td>4.081</td>
<td>440</td>
</tr>
<tr>
<td>53374.92</td>
<td>23.</td>
<td>-0.075</td>
<td>0.515</td>
<td>-0.398</td>
<td>4.274</td>
<td>439</td>
</tr>
<tr>
<td>53210.88</td>
<td>23.</td>
<td>-0.078</td>
<td>0.516</td>
<td>-0.553</td>
<td>4.502</td>
<td>438</td>
</tr>
<tr>
<td>53046.83</td>
<td>23.</td>
<td>-0.082</td>
<td>0.518</td>
<td>-0.697</td>
<td>4.750</td>
<td>437</td>
</tr>
<tr>
<td>52882.79</td>
<td>23.</td>
<td>-0.085</td>
<td>0.519</td>
<td>-0.830</td>
<td>5.014</td>
<td>436</td>
</tr>
<tr>
<td>52718.75</td>
<td>23.</td>
<td>-0.088</td>
<td>0.521</td>
<td>-0.951</td>
<td>5.285</td>
<td>435</td>
</tr>
<tr>
<td>52554.71</td>
<td>23.</td>
<td>-0.091</td>
<td>0.522</td>
<td>-1.062</td>
<td>5.564</td>
<td>434</td>
</tr>
<tr>
<td>52390.66</td>
<td>23.</td>
<td>-0.094</td>
<td>0.523</td>
<td>-1.164</td>
<td>5.851</td>
<td>433</td>
</tr>
<tr>
<td>52226.63</td>
<td>23.</td>
<td>-0.095</td>
<td>0.524</td>
<td>-1.262</td>
<td>6.150</td>
<td>432</td>
</tr>
<tr>
<td>52062.58</td>
<td>23.</td>
<td>-0.095</td>
<td>0.524</td>
<td>-1.354</td>
<td>6.456</td>
<td>431</td>
</tr>
<tr>
<td>51898.54</td>
<td>23.</td>
<td>-0.094</td>
<td>0.524</td>
<td>-1.442</td>
<td>6.767</td>
<td>430</td>
</tr>
<tr>
<td>51734.50</td>
<td>23.</td>
<td>-0.093</td>
<td>0.524</td>
<td>-1.523</td>
<td>7.088</td>
<td>429</td>
</tr>
<tr>
<td>51570.46</td>
<td>23.</td>
<td>-0.091</td>
<td>0.523</td>
<td>-1.602</td>
<td>7.430</td>
<td>428</td>
</tr>
<tr>
<td>51406.41</td>
<td>23.</td>
<td>-0.088</td>
<td>0.522</td>
<td>-1.680</td>
<td>7.782</td>
<td>427</td>
</tr>
<tr>
<td>51242.37</td>
<td>23.</td>
<td>-0.084</td>
<td>0.521</td>
<td>-1.751</td>
<td>8.116</td>
<td>426</td>
</tr>
<tr>
<td>51078.33</td>
<td>24.</td>
<td>-0.076</td>
<td>0.514</td>
<td>-1.719</td>
<td>8.222</td>
<td>425</td>
</tr>
<tr>
<td>50914.29</td>
<td>27.</td>
<td>-0.033</td>
<td>0.439</td>
<td>-1.794</td>
<td>9.052</td>
<td>424</td>
</tr>
<tr>
<td>FEET FROM POINTS</td>
<td>MEAN</td>
<td>STANDARD DEVIATION</td>
<td>SKEWNESS</td>
<td>KURTOSIS</td>
<td>BIN #</td>
<td></td>
</tr>
<tr>
<td>-----------------</td>
<td>------</td>
<td>---------------------</td>
<td>----------</td>
<td>----------</td>
<td>-------</td>
<td></td>
</tr>
<tr>
<td>THETA 50750.25</td>
<td>-0.077</td>
<td>0.488</td>
<td>-1.912</td>
<td>9.483</td>
<td>423</td>
<td></td>
</tr>
<tr>
<td>50586.20</td>
<td>-0.058</td>
<td>0.475</td>
<td>-2.040</td>
<td>10.205</td>
<td>422</td>
<td></td>
</tr>
<tr>
<td>50422.16</td>
<td>-0.063</td>
<td>0.468</td>
<td>-2.171</td>
<td>10.770</td>
<td>421</td>
<td></td>
</tr>
<tr>
<td>50258.12</td>
<td>-0.061</td>
<td>0.470</td>
<td>-2.168</td>
<td>10.744</td>
<td>420</td>
<td></td>
</tr>
<tr>
<td>50094.08</td>
<td>-0.048</td>
<td>0.465</td>
<td>-2.029</td>
<td>10.480</td>
<td>419</td>
<td></td>
</tr>
<tr>
<td>49930.04</td>
<td>-0.045</td>
<td>0.468</td>
<td>-2.016</td>
<td>10.389</td>
<td>418</td>
<td></td>
</tr>
<tr>
<td>49765.99</td>
<td>-0.042</td>
<td>0.471</td>
<td>-2.002</td>
<td>10.297</td>
<td>417</td>
<td></td>
</tr>
<tr>
<td>49601.95</td>
<td>-0.039</td>
<td>0.474</td>
<td>-1.989</td>
<td>10.216</td>
<td>416</td>
<td></td>
</tr>
<tr>
<td>49437.91</td>
<td>-0.036</td>
<td>0.477</td>
<td>-1.980</td>
<td>10.161</td>
<td>415</td>
<td></td>
</tr>
<tr>
<td>49273.87</td>
<td>-0.032</td>
<td>0.480</td>
<td>-1.972</td>
<td>10.130</td>
<td>414</td>
<td></td>
</tr>
<tr>
<td>49109.82</td>
<td>-0.028</td>
<td>0.482</td>
<td>-1.965</td>
<td>10.113</td>
<td>413</td>
<td></td>
</tr>
<tr>
<td>48945.79</td>
<td>-0.025</td>
<td>0.484</td>
<td>-1.955</td>
<td>10.088</td>
<td>412</td>
<td></td>
</tr>
<tr>
<td>48781.74</td>
<td>-0.022</td>
<td>0.487</td>
<td>-1.939</td>
<td>10.041</td>
<td>411</td>
<td></td>
</tr>
<tr>
<td>48517.70</td>
<td>-0.020</td>
<td>0.490</td>
<td>-1.919</td>
<td>9.970</td>
<td>410</td>
<td></td>
</tr>
<tr>
<td>48353.66</td>
<td>-0.017</td>
<td>0.493</td>
<td>-1.898</td>
<td>9.888</td>
<td>409</td>
<td></td>
</tr>
<tr>
<td>48289.62</td>
<td>-0.015</td>
<td>0.496</td>
<td>-1.877</td>
<td>9.817</td>
<td>408</td>
<td></td>
</tr>
<tr>
<td>43125.57</td>
<td>-0.012</td>
<td>0.499</td>
<td>-1.850</td>
<td>9.780</td>
<td>407</td>
<td></td>
</tr>
<tr>
<td>47951.53</td>
<td>-0.009</td>
<td>0.501</td>
<td>-1.848</td>
<td>9.790</td>
<td>406</td>
<td></td>
</tr>
<tr>
<td>47797.49</td>
<td>-0.008</td>
<td>0.502</td>
<td>-1.844</td>
<td>9.342</td>
<td>405</td>
<td></td>
</tr>
</tbody>
</table>
## 5-727 3.0 DEGREE MLS APPROACH

COMPOSITE DATA FILE DU2:CF521A.CSL
DECISION HEIGHT 200 FT

STANDARD STATISTICS SUMMARY

LONGITUDINAL BINS FOR INITIAL APPROACH SEGMENT

AZIMUTH TOTAL SYSTEM ERROR (DEG)

DATA COLLECTED AND PROCESSED AT:

THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

<table>
<thead>
<tr>
<th>FEET FROM POINTS</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
<th>BIN #</th>
</tr>
</thead>
<tbody>
<tr>
<td>47633.45</td>
<td>-0.002</td>
<td>0.503</td>
<td>-1.847</td>
<td>9.921</td>
<td>404</td>
</tr>
<tr>
<td>47469.41</td>
<td>0.002</td>
<td>0.504</td>
<td>-1.855</td>
<td>10.003</td>
<td>403</td>
</tr>
<tr>
<td>47305.36</td>
<td>0.005</td>
<td>0.505</td>
<td>-1.867</td>
<td>10.078</td>
<td>402</td>
</tr>
<tr>
<td>47141.32</td>
<td>0.008</td>
<td>0.506</td>
<td>-1.882</td>
<td>10.150</td>
<td>401</td>
</tr>
<tr>
<td>46977.28</td>
<td>0.010</td>
<td>0.507</td>
<td>-1.900</td>
<td>10.223</td>
<td>400</td>
</tr>
<tr>
<td>46813.24</td>
<td>0.014</td>
<td>0.507</td>
<td>-1.920</td>
<td>10.296</td>
<td>399</td>
</tr>
<tr>
<td>46649.20</td>
<td>0.013</td>
<td>0.507</td>
<td>-1.941</td>
<td>10.368</td>
<td>398</td>
</tr>
<tr>
<td>46485.15</td>
<td>0.014</td>
<td>0.508</td>
<td>-1.963</td>
<td>10.434</td>
<td>397</td>
</tr>
<tr>
<td>46321.11</td>
<td>0.016</td>
<td>0.508</td>
<td>-1.986</td>
<td>10.503</td>
<td>396</td>
</tr>
<tr>
<td>46157.07</td>
<td>0.018</td>
<td>0.508</td>
<td>-2.014</td>
<td>10.596</td>
<td>395</td>
</tr>
<tr>
<td>45993.03</td>
<td>0.021</td>
<td>0.508</td>
<td>-2.048</td>
<td>10.724</td>
<td>394</td>
</tr>
<tr>
<td>45828.98</td>
<td>0.033</td>
<td>0.502</td>
<td>-2.176</td>
<td>11.497</td>
<td>393</td>
</tr>
<tr>
<td>45604.95</td>
<td>0.039</td>
<td>0.502</td>
<td>-2.221</td>
<td>11.703</td>
<td>392</td>
</tr>
<tr>
<td>45500.90</td>
<td>0.120</td>
<td>0.603</td>
<td>-0.685</td>
<td>8.587</td>
<td>391</td>
</tr>
<tr>
<td>45336.86</td>
<td>0.123</td>
<td>0.598</td>
<td>-0.794</td>
<td>8.636</td>
<td>390</td>
</tr>
<tr>
<td>45172.82</td>
<td>0.126</td>
<td>0.593</td>
<td>-0.895</td>
<td>8.685</td>
<td>389</td>
</tr>
<tr>
<td>45008.78</td>
<td>0.129</td>
<td>0.589</td>
<td>-0.996</td>
<td>8.767</td>
<td>388</td>
</tr>
<tr>
<td>44844.73</td>
<td>0.131</td>
<td>0.583</td>
<td>-1.099</td>
<td>8.894</td>
<td>387</td>
</tr>
<tr>
<td>44680.69</td>
<td>0.133</td>
<td>0.579</td>
<td>-1.202</td>
<td>9.063</td>
<td>386</td>
</tr>
</tbody>
</table>
**LONGITUDINAL BINS FOR INITIAL APPROACH SEGMENT**

**AZIMUTM TOTAL SYSTEM ERROR (DEG)**

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

<table>
<thead>
<tr>
<th>FEET FROM POINTS THETA</th>
<th>MEAN THETA</th>
<th>STANDARD DEVIATION</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
<th>BIN #</th>
</tr>
</thead>
<tbody>
<tr>
<td>44516.65 33.0</td>
<td>0.135</td>
<td>0.574</td>
<td>-1.295</td>
<td>9.254</td>
<td>385</td>
</tr>
<tr>
<td>44352.61 33.0</td>
<td>0.138</td>
<td>0.570</td>
<td>-1.371</td>
<td>9.446</td>
<td>384</td>
</tr>
<tr>
<td>44188.57 33.0</td>
<td>0.141</td>
<td>0.567</td>
<td>-1.435</td>
<td>9.642</td>
<td>383</td>
</tr>
<tr>
<td>44024.52 33.0</td>
<td>0.145</td>
<td>0.564</td>
<td>-1.491</td>
<td>9.836</td>
<td>382</td>
</tr>
<tr>
<td>43860.48 33.0</td>
<td>0.148</td>
<td>0.562</td>
<td>-1.542</td>
<td>10.013</td>
<td>381</td>
</tr>
<tr>
<td>43696.44 33.0</td>
<td>0.150</td>
<td>0.559</td>
<td>-1.596</td>
<td>10.177</td>
<td>390</td>
</tr>
<tr>
<td>43532.40 35.0</td>
<td>0.141</td>
<td>0.549</td>
<td>-1.592</td>
<td>10.168</td>
<td>379</td>
</tr>
<tr>
<td>43368.36 35.0</td>
<td>0.144</td>
<td>0.545</td>
<td>-1.661</td>
<td>10.360</td>
<td>378</td>
</tr>
<tr>
<td>43204.31 35.0</td>
<td>0.147</td>
<td>0.541</td>
<td>-1.729</td>
<td>10.561</td>
<td>377</td>
</tr>
<tr>
<td>43040.27 35.0</td>
<td>0.149</td>
<td>0.537</td>
<td>-1.793</td>
<td>10.760</td>
<td>376</td>
</tr>
<tr>
<td>42876.23 35.0</td>
<td>0.152</td>
<td>0.533</td>
<td>-1.846</td>
<td>10.933</td>
<td>375</td>
</tr>
<tr>
<td>42712.19 35.0</td>
<td>0.154</td>
<td>0.530</td>
<td>-1.889</td>
<td>11.072</td>
<td>374</td>
</tr>
<tr>
<td>42548.14 35.0</td>
<td>0.156</td>
<td>0.528</td>
<td>-1.925</td>
<td>11.188</td>
<td>373</td>
</tr>
<tr>
<td>42384.11 35.0</td>
<td>0.159</td>
<td>0.525</td>
<td>-1.959</td>
<td>11.299</td>
<td>372</td>
</tr>
<tr>
<td>42220.06 35.0</td>
<td>0.161</td>
<td>0.522</td>
<td>-1.993</td>
<td>11.409</td>
<td>371</td>
</tr>
<tr>
<td>42056.02 35.0</td>
<td>0.163</td>
<td>0.519</td>
<td>-2.022</td>
<td>11.504</td>
<td>370</td>
</tr>
<tr>
<td>41891.98 35.0</td>
<td>0.166</td>
<td>0.516</td>
<td>-2.046</td>
<td>11.576</td>
<td>369</td>
</tr>
<tr>
<td>41727.94 33.0</td>
<td>0.168</td>
<td>0.513</td>
<td>-2.052</td>
<td>11.622</td>
<td>368</td>
</tr>
<tr>
<td>41563.89 33.0</td>
<td>0.170</td>
<td>0.510</td>
<td>-2.070</td>
<td>11.641</td>
<td>367</td>
</tr>
</tbody>
</table>
**B-727 3.0 Degree MLS Approach**

**Composite Data File:** DU2:CFS21A.CSL

**Decision Height:** 200 FT

**Standard Statistics Summary**

**Longitudinal Bins for Initial Approach Segment**

**Azimuth Total System Error (Deg)**

<table>
<thead>
<tr>
<th>Feet From Points</th>
<th>Points</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Skewness</th>
<th>Kurtosis</th>
<th>Bin %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theta</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>41399.85</td>
<td>35.</td>
<td>0.172</td>
<td>0.508</td>
<td>-2.068</td>
<td>11.631</td>
<td>366</td>
</tr>
<tr>
<td>41235.81</td>
<td>35.</td>
<td>0.173</td>
<td>0.505</td>
<td>-2.061</td>
<td>11.602</td>
<td>365</td>
</tr>
<tr>
<td>41071.77</td>
<td>35.</td>
<td>0.174</td>
<td>0.503</td>
<td>-2.052</td>
<td>11.566</td>
<td>364</td>
</tr>
<tr>
<td>40907.73</td>
<td>35.</td>
<td>0.175</td>
<td>0.500</td>
<td>-2.044</td>
<td>11.525</td>
<td>363</td>
</tr>
<tr>
<td>40743.68</td>
<td>35.</td>
<td>0.176</td>
<td>0.497</td>
<td>-2.033</td>
<td>11.488</td>
<td>362</td>
</tr>
<tr>
<td>40579.64</td>
<td>35.</td>
<td>0.177</td>
<td>0.494</td>
<td>-2.017</td>
<td>11.388</td>
<td>361</td>
</tr>
<tr>
<td>40415.60</td>
<td>35.</td>
<td>0.178</td>
<td>0.491</td>
<td>-2.000</td>
<td>11.308</td>
<td>360</td>
</tr>
<tr>
<td>40251.56</td>
<td>35.</td>
<td>0.178</td>
<td>0.487</td>
<td>-1.984</td>
<td>11.230</td>
<td>359</td>
</tr>
<tr>
<td>40087.52</td>
<td>35.</td>
<td>0.177</td>
<td>0.484</td>
<td>-1.964</td>
<td>11.134</td>
<td>358</td>
</tr>
<tr>
<td>39923.47</td>
<td>35.</td>
<td>0.177</td>
<td>0.481</td>
<td>-1.940</td>
<td>11.009</td>
<td>357</td>
</tr>
<tr>
<td>39759.43</td>
<td>35.</td>
<td>0.177</td>
<td>0.478</td>
<td>-1.912</td>
<td>10.854</td>
<td>356</td>
</tr>
<tr>
<td>39595.39</td>
<td>35.</td>
<td>0.176</td>
<td>0.476</td>
<td>-1.879</td>
<td>10.667</td>
<td>355</td>
</tr>
<tr>
<td>39431.35</td>
<td>35.</td>
<td>0.174</td>
<td>0.474</td>
<td>-1.837</td>
<td>10.441</td>
<td>354</td>
</tr>
<tr>
<td>39267.30</td>
<td>35.</td>
<td>0.172</td>
<td>0.472</td>
<td>-1.788</td>
<td>10.174</td>
<td>353</td>
</tr>
<tr>
<td>39103.27</td>
<td>35.</td>
<td>0.169</td>
<td>0.471</td>
<td>-1.735</td>
<td>9.876</td>
<td>352</td>
</tr>
<tr>
<td>38939.22</td>
<td>35.</td>
<td>0.167</td>
<td>0.470</td>
<td>-1.680</td>
<td>9.563</td>
<td>351</td>
</tr>
<tr>
<td>38775.18</td>
<td>35.</td>
<td>0.165</td>
<td>0.470</td>
<td>-1.619</td>
<td>9.222</td>
<td>350</td>
</tr>
<tr>
<td>38611.14</td>
<td>35.</td>
<td>0.162</td>
<td>0.471</td>
<td>-1.553</td>
<td>8.361</td>
<td>349</td>
</tr>
<tr>
<td>38447.10</td>
<td>35.</td>
<td>0.160</td>
<td>0.471</td>
<td>-1.434</td>
<td>8.487</td>
<td>348</td>
</tr>
</tbody>
</table>
LONGITUDINAL BINS FOR INITIAL APPROACH SEGMENT

AZIMUTH TOTAL SYSTEM ERROR (DEG)

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

<table>
<thead>
<tr>
<th>FEET FROM POINTS</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
<th>BIN #</th>
</tr>
</thead>
<tbody>
<tr>
<td>38283.05</td>
<td>0.157</td>
<td>0.473</td>
<td>-1.416</td>
<td>8.121</td>
<td>347</td>
</tr>
<tr>
<td>38119.01</td>
<td>0.154</td>
<td>0.474</td>
<td>-1.342</td>
<td>7.748</td>
<td>346</td>
</tr>
<tr>
<td>37954.97</td>
<td>0.149</td>
<td>0.477</td>
<td>-1.263</td>
<td>7.375</td>
<td>345</td>
</tr>
<tr>
<td>37790.93</td>
<td>0.145</td>
<td>0.479</td>
<td>-1.184</td>
<td>7.040</td>
<td>344</td>
</tr>
<tr>
<td>37626.89</td>
<td>0.140</td>
<td>0.482</td>
<td>-1.099</td>
<td>6.664</td>
<td>343</td>
</tr>
<tr>
<td>37462.84</td>
<td>0.134</td>
<td>0.484</td>
<td>-1.038</td>
<td>6.337</td>
<td>342</td>
</tr>
<tr>
<td>37298.80</td>
<td>0.129</td>
<td>0.486</td>
<td>-0.969</td>
<td>6.034</td>
<td>341</td>
</tr>
<tr>
<td>37134.76</td>
<td>0.123</td>
<td>0.489</td>
<td>-0.901</td>
<td>5.749</td>
<td>340</td>
</tr>
<tr>
<td>36970.72</td>
<td>0.118</td>
<td>0.491</td>
<td>-0.832</td>
<td>5.482</td>
<td>339</td>
</tr>
<tr>
<td>36806.68</td>
<td>0.112</td>
<td>0.494</td>
<td>-0.762</td>
<td>5.234</td>
<td>338</td>
</tr>
<tr>
<td>36642.63</td>
<td>0.107</td>
<td>0.498</td>
<td>-0.695</td>
<td>5.010</td>
<td>337</td>
</tr>
<tr>
<td>36478.59</td>
<td>0.103</td>
<td>0.500</td>
<td>-0.632</td>
<td>4.808</td>
<td>336</td>
</tr>
<tr>
<td>36314.55</td>
<td>0.098</td>
<td>0.503</td>
<td>-0.571</td>
<td>4.621</td>
<td>335</td>
</tr>
<tr>
<td>36150.51</td>
<td>0.093</td>
<td>0.506</td>
<td>-0.511</td>
<td>4.440</td>
<td>334</td>
</tr>
<tr>
<td>35986.46</td>
<td>0.090</td>
<td>0.509</td>
<td>-0.460</td>
<td>4.267</td>
<td>333</td>
</tr>
<tr>
<td>35822.43</td>
<td>0.088</td>
<td>0.513</td>
<td>-0.426</td>
<td>4.109</td>
<td>332</td>
</tr>
<tr>
<td>35658.38</td>
<td>0.089</td>
<td>0.517</td>
<td>-0.403</td>
<td>3.962</td>
<td>331</td>
</tr>
<tr>
<td>35494.34</td>
<td>0.087</td>
<td>0.522</td>
<td>-0.379</td>
<td>3.817</td>
<td>330</td>
</tr>
<tr>
<td>35330.30</td>
<td>0.085</td>
<td>0.528</td>
<td>-0.353</td>
<td>3.697</td>
<td>329</td>
</tr>
</tbody>
</table>
6-727 3.0 DEGREE MLS APPROACH
COMPOSITE DATA FILE DU2:CF52IA.CSL
DECISION HEIGHT 200 FT
STANDARD STATISTICS SUMMARY

LONGITUDINAL BINS FOR INITIAL APPROACH SEGMENT

AZIMUTH TOTAL SYSTEM ERROR (DEG)

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

<table>
<thead>
<tr>
<th>FEET FROM POINTS</th>
<th>MEAN</th>
<th>STANDARD DEVIATION</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
<th>BIN #</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE ETA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35166.26</td>
<td>36°</td>
<td>0.081</td>
<td>0.522</td>
<td>-0.292</td>
<td>3.661</td>
</tr>
<tr>
<td>35002.21</td>
<td>36°</td>
<td>0.080</td>
<td>0.523</td>
<td>-0.259</td>
<td>3.601</td>
</tr>
<tr>
<td>34838.17</td>
<td>36°</td>
<td>0.080</td>
<td>0.524</td>
<td>-0.223</td>
<td>3.551</td>
</tr>
<tr>
<td>34974.13</td>
<td>36°</td>
<td>0.080</td>
<td>0.524</td>
<td>-0.189</td>
<td>3.510</td>
</tr>
<tr>
<td>34510.09</td>
<td>36°</td>
<td>0.080</td>
<td>0.524</td>
<td>-0.154</td>
<td>3.469</td>
</tr>
</tbody>
</table>
APPENDIX F

MINIMA ANALYSIS
B-727 3.0 DEGREE MLS APPROACH
COMPOSITE DATA FILE DU2:CFE2MA.CSM

MINIMA ANALYSIS STATISTICS

DECISION HEIGHT 200 FT

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

ALTITUDE AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>201.36</td>
<td>9.98</td>
<td>3.97</td>
<td>17.68</td>
</tr>
</tbody>
</table>

ALONG TRACK AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>3589.37</td>
<td>873.61</td>
<td>-2.36</td>
<td>8.54</td>
</tr>
</tbody>
</table>

CROSS TRACK AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>-19.99</td>
<td>50.41</td>
<td>-1.03</td>
<td>4.86</td>
</tr>
</tbody>
</table>

ALONG TRACK AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>2722.32</td>
<td>617.41</td>
<td>-1.07</td>
<td>5.42</td>
</tr>
</tbody>
</table>

CROSS TRACK AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>-20.72</td>
<td>41.50</td>
<td>-0.19</td>
<td>3.12</td>
</tr>
</tbody>
</table>

LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>162.17</td>
<td>20.55</td>
<td>1.59</td>
<td>3.20</td>
</tr>
</tbody>
</table>
## MINIMA ANALYSIS STATISTICS

### DECISION HEIGHT 200 FT

- **RADIO ALTIMETER AT DECISION HEIGHT (FT)**
  - Points: 46
  - Mean: 207.34
  - Std. Dev: 13.74
  - Skewness: 1.86
  - Kurtosis: 7.09

- **BARO ALTIMETER AT DECISION HEIGHT (FT)**
  - Points: 46
  - Mean: -39.33
  - Std. Dev: 16.04
  - Skewness: -2.93
  - Kurtosis: 9.00

- **COARSE BARO ALTIMETER AT DECISION HEIGHT (FT)**
  - Points: 46
  - Mean: 39.02
  - Std. Dev: 5.34
  - Skewness: -0.36
  - Kurtosis: 2.15

- **FINE BARO ALTIMETER AT DECISION HEIGHT (FT)**
  - Points: 46
  - Mean: 4107.85
  - Std. Dev: 1.02
  - Skewness: -0.09
  - Kurtosis: 3.02

- **RADIO ALTIMETER AT LOWEST ALTITUDE (FT)**
  - Points: 46
  - Mean: 154.31
  - Std. Dev: 25.02
  - Skewness: 0.36
  - Kurtosis: 3.65

### DATA COLLECTED AND PROCESSED AT:

- **THE FAA TECHNICAL CENTER
  ATLANTIC CITY AIRPORT, NJ 08405**
**B-727 3.0 DEGREE MLS APPROACH**

**COMPOSITE DATA FILE** DU2-CFB2MA.CSM

**MINIMA ANALYSIS STATISTICS**

**DECISION HEIGHT** 200 FT

---

**DATA COLLECTED AND PROCESSED AT:**

THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

---

**BARO ALTIMETER AT LOWEST ALTITUDE (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>-82.62</td>
<td>991.7</td>
<td>-2.93</td>
<td>9.60</td>
</tr>
</tbody>
</table>

**COARSE BARO ALTIMETER AT LOWEST ALTITUDE (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>34.93</td>
<td>4.66</td>
<td>-0.84</td>
<td>3.67</td>
</tr>
</tbody>
</table>

**FINE BARO ALTIMETER AT LOWEST ALTITUDE (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>46</td>
<td>4110.46</td>
<td>7.94</td>
<td>0.07</td>
<td>1.30</td>
</tr>
</tbody>
</table>
9-727 3.0 DEGREE MLS APPROACH
COMPOSITE DATA FILE JU5:CFB3MA.CSM

MINIMA ANALYSIS STATISTICS

DECISION HEIGHT 100 FT

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

ALTITUDE AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47 101.60</td>
<td>10.76</td>
<td>4.85</td>
<td>26.48</td>
</tr>
</tbody>
</table>

ALONG TRACK AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47 1772.30</td>
<td>603.82</td>
<td>-1.85</td>
<td>5.23</td>
</tr>
</tbody>
</table>

CROSS TRACK AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47 -14.55</td>
<td>26.35</td>
<td>0.07</td>
<td>3.61</td>
</tr>
</tbody>
</table>

ALONG TRACK AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47 1441.18</td>
<td>309.77</td>
<td>-1.04</td>
<td>4.02</td>
</tr>
</tbody>
</table>

CROSS TRACK AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47 -9.35</td>
<td>27.08</td>
<td>0.08</td>
<td>3.60</td>
</tr>
</tbody>
</table>

LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>47 66.18</td>
<td>13.07</td>
<td>0.97</td>
<td>5.51</td>
</tr>
</tbody>
</table>
B-727 3.0 DEGREE MLS APPROACH
COMPOSITE DATA FILE DUJ:CFSMA.CSM

MINIMA ANALYSIS STATISTICS
DECISION HEIGHT 100 FT

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

HEIGHT LOSS (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.</td>
<td>15.42</td>
<td>15.95</td>
<td>2.71</td>
<td>10.47</td>
</tr>
</tbody>
</table>

RADIO ALTIMETER AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.</td>
<td>83.75</td>
<td>15.04</td>
<td>5.62</td>
<td>35.52</td>
</tr>
</tbody>
</table>

BARO ALTIMETER AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.</td>
<td>-130.21</td>
<td>965.83</td>
<td>-2.97</td>
<td>9.85</td>
</tr>
</tbody>
</table>

COARSE BARO ALTIMETER AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.</td>
<td>29.74</td>
<td>2.63</td>
<td>-1.36</td>
<td>7.39</td>
</tr>
</tbody>
</table>

FINE BARO ALTIMETER AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.</td>
<td>4111.28</td>
<td>5.32</td>
<td>0.76</td>
<td>3.09</td>
</tr>
</tbody>
</table>

RADIO ALTIMETER AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47.</td>
<td>64.43</td>
<td>13.39</td>
<td>0.67</td>
<td>4.09</td>
</tr>
</tbody>
</table>
B-727 3.0 DEGREE MLS APPROACH
COMPOSITE DATA FILE DU3:CF33MA.CSM

MINIMA ANALYSIS STATISTICS

DECISION HEIGHT 100 FT

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

BARO ALTIMETER AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>-149.53</td>
<td>959.88</td>
<td>-2.97</td>
<td>9.84</td>
</tr>
</tbody>
</table>

COARSE BARO ALTIMETER AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>27.81</td>
<td>2.56</td>
<td>-0.34</td>
<td>4.89</td>
</tr>
</tbody>
</table>

FINE BARO ALTIMETER AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>4120.06</td>
<td>3.50</td>
<td>0.25</td>
<td>2.61</td>
</tr>
</tbody>
</table>
### 3-727 3.5 DEGREE MLS APPROACH

COMPOSITE DATA FILE DU4:CF#4MA.CSM

### MINIMA ANALYSIS STATISTICS

**DEcision Height** 200 FT

---

**DATA COLLECTED AND PROCESSED AT:**

THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

---

**Altitude at Decision Height (FT)**

<table>
<thead>
<tr>
<th>Points</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>203.92</td>
<td>18.43</td>
<td>3.21</td>
<td>11.63</td>
</tr>
</tbody>
</table>

**Along Track at Decision Height (FT)**

<table>
<thead>
<tr>
<th>Points</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>3177.48</td>
<td>677.19</td>
<td>-3.49</td>
<td>17.10</td>
</tr>
</tbody>
</table>

**Cross Track at Decision Height (FT)**

<table>
<thead>
<tr>
<th>Points</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>-12.88</td>
<td>54.60</td>
<td>0.04</td>
<td>2.82</td>
</tr>
</tbody>
</table>

**Along Track at Lowest Altitude (FT)**

<table>
<thead>
<tr>
<th>Points</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>2202.34</td>
<td>464.98</td>
<td>-2.14</td>
<td>11.54</td>
</tr>
</tbody>
</table>

**Cross Track at Lowest Altitude (FT)**

<table>
<thead>
<tr>
<th>Points</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>-7.97</td>
<td>48.71</td>
<td>0.36</td>
<td>3.30</td>
</tr>
</tbody>
</table>

**Lowest Altitude (FT)**

<table>
<thead>
<tr>
<th>Points</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>155.54</td>
<td>19.62</td>
<td>2.14</td>
<td>10.66</td>
</tr>
</tbody>
</table>
**B-727 3.5 DEGREE MLS APPROACH**
*COMPOSITE DATA FILE 0C4:CFE4MA.CSM*

**MINIMA ANALYSIS STATISTICS**

**DECISION HEIGHT** 200 FT

---

**DATA COLLECTED AND PROCESSED AT:**
*THE FAA TECHNICAL CENTER*
*ATLANTIC CITY AIRPORT, NJ 08405*

---

**HEIGHT LOSS (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>48.39</td>
<td>23.39</td>
<td>1.20</td>
<td>6.44</td>
</tr>
</tbody>
</table>

**RADIO ALTIMETER AT DECISION HEIGHT (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>210.69</td>
<td>18.85</td>
<td>3.16</td>
<td>12.43</td>
</tr>
</tbody>
</table>

**BARO ALTIMETER AT DECISION HEIGHT (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>-13.18</td>
<td>969.41</td>
<td>-3.05</td>
<td>10.34</td>
</tr>
</tbody>
</table>

**COARSE BARO ALTIMETER AT DECISION HEIGHT (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>39.08</td>
<td>5.79</td>
<td>0.23</td>
<td>5.22</td>
</tr>
</tbody>
</table>

**FINE BARG ALTIMETER AT DECISION HEIGHT (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>418.10</td>
<td>1.61</td>
<td>-0.02</td>
<td>2.50</td>
</tr>
</tbody>
</table>

**RADIO ALTIMETER AT LOWEST ALTITUDE (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49</td>
<td>137.39</td>
<td>26.05</td>
<td>-1.74</td>
<td>14.61</td>
</tr>
</tbody>
</table>

---
**6-727 3.5 DEGREE MLS APPROACH**

**COMPOSITE DATA FILE DU4:CFB4MA.CSM**

**MINIMA ANALYSIS STATISTICS**

**DECISION HEIGHT 200 FT**

---

**DATA COLLECTED AND PROCESSED AT:**

**THE FAA TECHNICAL CENTER**

**ATLANTIC CITY AIRPORT, NJ 08405**

---

**BARO ALTIMETER AT LOWEST ALTITUDE (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49.</td>
<td>-72.48</td>
<td>952.55</td>
<td>-3.05</td>
<td>10.32</td>
</tr>
</tbody>
</table>

**COARSE BARO ALTIMETER AT LOWEST ALTITUDE (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49.</td>
<td>33.69</td>
<td>6.36</td>
<td>-3.23</td>
<td>17.23</td>
</tr>
</tbody>
</table>

**FINE BARO ALTIMETER AT LOWEST ALTITUDE (FT)**

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>49.</td>
<td>4027.24</td>
<td>587.31</td>
<td>-6.78</td>
<td>47.02</td>
</tr>
</tbody>
</table>
### MINIMA ANALYSIS STATISTICS

#### DECISION HEIGHT 200 FT

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

#### ALTITUDE AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>200.11</td>
<td>10.47</td>
<td>6.57</td>
<td>44.44</td>
</tr>
</tbody>
</table>

#### ALONG TRACK AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>2845.35</td>
<td>327.13</td>
<td>-1.40</td>
<td>7.93</td>
</tr>
</tbody>
</table>

#### CROSS TRACK AT DECISION HEIGHT (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>-11.20</td>
<td>48.85</td>
<td>-0.68</td>
<td>3.50</td>
</tr>
</tbody>
</table>

#### ALONG TRACK AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>1837.65</td>
<td>372.61</td>
<td>-0.37</td>
<td>2.71</td>
</tr>
</tbody>
</table>

#### CROSS TRACK AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>-13.11</td>
<td>47.82</td>
<td>-0.17</td>
<td>3.37</td>
</tr>
</tbody>
</table>

#### LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>152.80</td>
<td>24.92</td>
<td>1.99</td>
<td>11.73</td>
</tr>
</tbody>
</table>
MINIMA ANALYSIS STATISTICS

DECISION HEIGHT  200 FT

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

<table>
<thead>
<tr>
<th>HEIGHT LOSS (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POINTS</td>
</tr>
<tr>
<td>47.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RADIO ALTIMETER AT DECISION HEIGHT (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POINTS</td>
</tr>
<tr>
<td>47.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>BARO ALTIMETER AT DECISION HEIGHT (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POINTS</td>
</tr>
<tr>
<td>47.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COARSE BARO ALTIMETER AT DECISION HEIGHT (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POINTS</td>
</tr>
<tr>
<td>47.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>FINE BARO ALTIMETER AT DECISION HEIGHT (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POINTS</td>
</tr>
<tr>
<td>47.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RADIO ALTIMETER AT LOWEST ALTITUDE (FT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>POINTS</td>
</tr>
<tr>
<td>47.</td>
</tr>
</tbody>
</table>
B-727 4.0 DEGREE MLS APPROACH
COMPOSITE DATA FILE QS:5:FBMMA.CSM

MINIMA ANALYSIS STATISTICS

DECISION HEIGHT 200 FT

DATA COLLECTED AND PROCESSED AT:
THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

BARE ALTIMETER AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>-83.51</td>
<td>979.04</td>
<td>-2.97</td>
<td>9.84</td>
</tr>
</tbody>
</table>

COARSE BARE ALTIMETER AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>34.02</td>
<td>4.34</td>
<td>-0.77</td>
<td>3.61</td>
</tr>
</tbody>
</table>

FINE BARE ALTIMETER AT LOWEST ALTITUDE (FT)

<table>
<thead>
<tr>
<th>POINTS</th>
<th>MEAN</th>
<th>STD. DEV.</th>
<th>SKEWNESS</th>
<th>KURTOSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>47</td>
<td>4111.49</td>
<td>2.13</td>
<td>-0.00</td>
<td>1.51</td>
</tr>
</tbody>
</table>
APPENDIX G

COMPOSITE PLOTS
ALL VALID RUNS
COMPOSITE PLOT
AIRCRAFT: BOEING-727
3 DEG MAP
LASER FAIR
ALL VALID RUNS
COMPOSITE PLOT
AIRCRAFT: BOEING-727
3 DEG LAND
LASER EAIR
ALL VALID RUNS

COMPOSITE PLOT

AIRCRAFT: BOEING-727

3 DEG LAND
ALL VALID RUNS
COMPOSITE PLOT
AIRCRAFT: BOEING-727
3 DEG MAP CAT II
LASER EAIR
ALL VALID RUNS

COMPOSITE PLOT

AIRCRAFT: BOEING-727

3 DEG MAP CAT II

LASER EAIR
ALL VALID RUNS

COMPOSITE PLOT

AIRCRAFT: BOEING-727

3.5 DEG MAP
APPENDIX H

ISOPROBABILITY PLOTS
B-727 MLS TERPS
3 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ALTITUDE (FT)

KEY
- MEAN+ (6*STD.DEV.)
- MEAN
- MEAN- (6*STD.DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
3 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (DEG)

LONGITUDINAL BIN RANGE (NMI)

AZIMUTH TOTAL SYSTEM ERROR (DEG)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)
B-727 MLS TERPS
3 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (DEG)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
0-727 MLS TERPS
3 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)
B-727 HLS TERPS
3 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (KFS)

KEY
- MEAN • (6 • STD. DEV.)
- MEAN - (6 • STD. DEV.)

7.77 BIN RANGE (NMI)
8.29 8.82
9.34 9.86
10.38

AZIMUTH FLIGHT TECHNICAL ERROR (KFS)
5.68 6.20 6.73 7.25 7.77
20-02 22-72 25-42 55-75 78-88
116-88 141-57
B-727 MLS TERPS
3 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH NAVIGATION SYSTEM ERROR (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
CROSS TRACK (FT)

KEY
- MEAN ± (6*STD.DEV.)
- MEAN
- MEAN ± (6*STD.DEV.)
8-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (FT)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

// Diagram showing longitudinal bin range (NMI) vs. azimuth total system error (FT) with mean and standard deviation markers. //
B-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (DEG)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)
B-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (FT)

<table>
<thead>
<tr>
<th>KEY</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEAN* (6*STD.DEV.)</td>
</tr>
<tr>
<td>MEAN</td>
</tr>
<tr>
<td>MEAN - (6*STD.DEV.)</td>
</tr>
</tbody>
</table>

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS.
AZIMUTH FLIGHT TECHNICAL ERROR (%FS)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION TOTAL SYSTEM ERROR (FT)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION FLIGHT TECHNICAL ERROR (DEG)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)

0.66 1.21 1.77 2.32 2.88 3.43 3.99 4.54 5.10 5.65
B-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION FLIGHT TECHNICAL ERROR (FT)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
9-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION NAVIGATION SYSTEM ERROR (DEG)

KEY

- MEAN+ (6*STD. DEV.)
- MEAN
- MEAN- (6*STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)

ELEVATION NAVIGATION SYSTEM ERROR (DEG)
B-727 MLS TERPS
3 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION NAVIGATION SYSTEM ERROR (FT)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

ELEVATION NAVIGATION SYSTEM ERROR (FT) • 10^6
-3.26
-9.27
-23.23
-37.20

LONGITUDINAL BIN RANGE (NMI)
0.66 1.21 1.77 2.32 2.88 3.43 3.99 4.54 5.10 5.65
B-727 MLS TERPS
3 DEGREE APPROACH - MISSED APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
CROSS TRACK (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
J DEGREE APPROACH - MISSED APPROACH SEGMENT
VERTICAL BINS
STANDARD STATISTICS
ALONG TRACK (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
9-727 MLS TERPS
3 DEGREE APPROACH - CAT II INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ALTITUDE (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
3 DEGREE APPROACH - CAT II INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (FT)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3 DEGREE APPROACH - CAT II INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
7° DEGREE APPROACH - CAT II FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
CROSS TRACK (FT)

KEY
- mean + (6 * std. dev.)
- mean
- mean - (6 * std. dev.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

LONGITUDINAL BIN RANGE (NMI)
0.34 0.93 1.52 2.11 2.70 3.29 3.88 4.47 5.06 5.65
3 DEGREE APPROACH - CAT II FINAL APPROACH SEGMENT

LONGITUDINAL BINS

STANDARD STATISTICS

ALTITUDE (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3 DEGREE APPROACH - CAT 11 FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (DEG)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
R-70 MLS TERPS
3 DEGREE APPROACH - CAT II FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (DEG)

KEY
- MEAN+ (6 • STD.DEV.)
- MEAN
- MEAN- (6 • STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

LONGITUDINAL BIN RANGE (NMI)
Azimuth Flight Technical Error (ZFS)

LONGITUDINAL BIN RANGE (NMI)

0.34  0.93  1.52  2.11  2.70  3.29  3.88  4.47  5.06  5.65
Figure 2. A 707 DME TERPS:
3. DEPEE APPROACH - CAT II FINAL APPROACH SEGMENT
LONGITUDINAL RINS
STANDARD STATISTICS
AZIMUTH NAVIGATION SYSTEM ERRGR (DEG)

KEY
- MEAN+(6*STD.DEV.)
- MEAN
- MEAN-(6*STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405

LONGITUDINAL BIN RANGE (NMI)

-0.17
0.63
0.93
1.52
2.11
2.70
3.23
3.88
4.47
5.06
5.65

-0.27
0.34
0.55
0.76
0.97
1.18
1.39
1.60
1.81
2.02
2.23
2.44
2.65
2.86
3.07
3.28
3.49
3.70
3.91
4.12
4.33
4.54
4.75
4.96
5.17
5.38
5.59
5.80
6.01
6.22
6.43

9-77 MLS TERPS
1 DEGREE APPROACH - CAT II FINAL APPROACH SEGMENT
LONITUDINAL BINS
STANDARD STATISTICS
AZIMUTH NAVIGATION SYSTEM ERROR (F1)

KEY
- MEAN+ (6*STD.DEV.)
- MEAN
- MEAN- (6*STD.DEV.)

LONGITUDINAL BIN RANGE (NMI)
8-727 MLS TERPS
3 DEGREE APPROACH - CAT II FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION FLIGHT TECHNICAL ERROR (%FS)

KEY
- MEAN+ (6*STD.DEV.)
- MEAN
- MEAN- (6*STD.DEV.)

ELEVATION FLIGHT TECHNICAL ERROR (%FS)
0.34 0.93 1.52 2.11 2.70 3.29 3.88 4.47 5.06 5.65
LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
3 DEGREE APPROACH - CAT II FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION NAVIGATION SYSTEM ERROR (FT)

**Key**
- Mean + (6 * Std. Dev.)
- Mean
- Mean - (6 * Std. Dev.)

Data processed by the FAA Technical Center
Atlantic City Airport, NJ 08405
B-727 MLS TERPS
3 DEGREE APPROACH - CAT II MISSED APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ALTITUDE (FT)
B-727 MLS TERPS
3 DEGREE APPROACH - CAT II MISSED APPROACH SEGMENT
VERTICAL BINS
STANDARD STATISTICS
CROSS TRACK (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

VERTICAL BIN ALTITUDE (FT) *10^1
B-727 MLS TERPS
3 DEGREE APPROACH - CAT II MISSED APPROACH SEGMENT
VERTICAL BINS
STANDARD STATISTICS
ALONG TRACK (FT)

KEY
- MEAN + (6 • STD. DEV.)
- MEAN
- MEAN - (6 • STD. DEV.)
B-727 MLS TERPS
3.5 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
CROSS TRACK (FT)

KEY
- MEAN+ (6*STD.DEV.)
- MEAN
- MEAN- (6*STD.DEV.)

<table>
<thead>
<tr>
<th>LONGITUDINAL BIN RANGE (NMI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.68</td>
</tr>
<tr>
<td>CROSS TRACK (FT)</td>
</tr>
<tr>
<td>-10.50</td>
</tr>
</tbody>
</table>

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3.5 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (DEG)

KEY
- MEAN+ (6 * STD. DEV.)
- MEAN
- MEAN- (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3.5 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)

AZIMUTH TOTAL SYSTEM ERROR (FT)
-13.01
-15.29
-13.58
-15.83
1.31
1.88

-5.68
-6.20
-6.72
-7.25
-7.77
-8.29
-8.81
-9.34
-9.86
10.38
B-727 MLS TERPS
3.5 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (DEG)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
3.5 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (FT)

KEY
- MEAN+ (6•STD.DEV.)
- MEAN
- MEAN- (6•STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3.5 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH NAVIGATION SYSTEM ERROR (DEG)

KEY
- MEAN (6*STD.DEV.)
- MEAN
- MEAN- (6*STD.DEV.)

LONGITUDINAL BIN RANGE (NMI)
8-727 MLS TERPS
3.5 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH NAVIGATION SYSTEM ERROR (FT)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3.5 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (DEG)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
3.5 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (DEG)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
3.5 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (%FS)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
3.5 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH NAVIGATION SYSTEM ERROR (DEG)

**KEY**
- **MEAN - (6*STD.DEV.)**
- **MEAN**
- **MEAN + (6*STD.DEV.)**

LONGITUDINAL BIN RANGE (NMI)
9-727 MLS TERPS
3.5 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION TOTAL SYSTEM ERROR (FT)

LONGITUDINAL BIN RANGE (NMI)
9-727 MLS TERPS
3.5 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONITUDINAL BINS
STANDARD STATISTICS
ELEVATION FLIGHT TECHNICAL ERROR (DEG)

**KEY**
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)
9.727 MLS TERPS
4.4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION FLIGHT TECHNICAL ERROR (ZFS)

KEY
- MEAN+ (6*STD. DEV.)
- MEAN
- MEAN- (6*STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
1.5 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL RINS
STANDARD STATISTICS
ELEVATION NAVIGATION SYSTEM ERROR (FT)
R-707 MLS TERPS
3.5 DEGREE APPROACH - MISSED APPROACH SEGMENT
LONGITUDINAL PINS
STANDARD STATISTICS
CROSS TRACK (FT)

KEY
--- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
KEY
- MEAN+(6*STD.DEV.)
- MEAN
- MEAN-(6*STD.DEV.)

A-727 MLS TERPS
1.5 DEGREE APPROACH - MISSED APPROACH SEGMENT
VERTICAL BINS
STANDARD STATISTICS
CROSS TRACK (FT)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT. RJ GEOS
9-727 MLS TERPS
4 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
CROSS TRACK (F1)

KEY
- MEAN+ (6*STD.DEV.)
- MEAN
- MEAN- (6*STD.DEV.)

LONGITUDINAL BIN RANGE (NMI)

-10.38
-9.83
-9.28
-8.73
-8.18
-7.64
-7.09
-6.54
-5.99
-5.44
R-707 MLS TERPS
DE P3E APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ALTITUDE (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)

B-727 MLS TERPS
4 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (DEG)

KEY
- MEAN + (6 STD. DEV.)
- MEAN
- MEAN - (6 STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
4 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
4 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (%FS)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
4 DEGREE APPROACH - INTERMEDIATE APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH NAVIGATION SYSTEM ERROR (DEG)

KEY
- - MEAN + (6 * STD. DEV.)
- - MEAN
- - MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
CROSS TRACK (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH TOTAL SYSTEM ERROR (DEG)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH FLIGHT TECHNICAL ERROR (%FS)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
AZIMUTH NAVIGATION SYSTEM ERROR (FT)

KEY
- MEAN+ (6*STD.DEV.)
- MEAN
- MEAN- (6*STD.DEV.)
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION TOTAL SYSTEM ERROR (DEG)

KEY
- MEAN+ (6*STD.DEV.)
- MEAN
- MEAN- (6*STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION TOTAL SYSTEM ERROR (FT)

KEY
- MEAN + (6 * STD.DEV.)
- MEAN
- MEAN - (6 * STD.DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION FLIGHT TECHNICAL ERROR (DEG)

KEY
- - MEAN + (6*STD.DEV.)
- - MEAN
- - MEAN - (6*STD.DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION FLIGHT TECHNICAL ERROR (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION FLIGHT TECHNICAL ERROR (%FS)

KEY
- MEAN + (6*STD.DEV.)
- MEAN
- MEAN - (6*STD.DEV.)
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION NAVIGATION SYSTEM ERROR (DEG)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

LONGITUDINAL BIN RANGE (NMI)

ELEVATION NAVIGATION SYSTEM ERROR (DEG)
B-727 MLS TERPS
4 DEGREE APPROACH - FINAL APPROACH SEGMENT
LONGITUDINAL BINS
STANDARD STATISTICS
ELEVATION NAVIGATION SYSTEM ERROR (FT)

KEY
- MEAN + (6 * STD. DEV.)
- MEAN
- MEAN - (6 * STD. DEV.)

DATA PROCESSED BY THE FAA TECHNICAL CENTER
ATLANTIC CITY AIRPORT, NJ 08405
APPENDIX I

SAMPLE LANDING SEGMENT SCATTER PLOTS
B-727 MLS TERPS
4.0 DEGREE APPROACH - LANDING SEGMENT
VERTICAL BINS
ALONG TRACK (FT) AT ALTITUDE 200.000
B-727 MLS TERPS
4.0 DEGREE APPROACH - LANDING SEGMENT
LONGITUDINAL BINS
ALTITUDE (FT) AT RANGE 2847.579
B-727 MLS TERPS
3.0 DEGREE APPROACH - LANDING SEGMENT
VERTICAL BINS
ALONG TRACK (FT) AT ALTITUDE 200.000
END
12 - 87
DTIC