ORDER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8200.41

11/6/98

SUBJ: FLIGHT INSPECTION EVALUATION OF DIFFERENTIAL GLOBAL NAVIGATION SATELLITE POSITIONING SYSTEM (DGNSS) SPECIAL CATEGORY I (SCAT-1) INSTRUMENT APPROACHES USING PRIVATE GROUND FACILITIES

1. PURPOSE. This order details the flight inspection procedures, requirements and analysis for the evaluation of Special (not for public use) Category I (SCAT-1) precision instrument approach procedures utilizing private Differential Global Navigation Satellite System (DGNSS) ground reference systems.

2. DISTRIBUTION. This order is distributed to the division level in Airway Facilities and Air Traffic, and to the branch level in Aviation System Standards, Washington headquarters; to the Regulatory Standards and Compliance Division, FAA Academy; to the branch level in the regional Airway Facilities, Air Traffic, and Flight Standards Divisions; to the Flight Inspection Offices and International Flight Inspection Office; and to Special Military Addressees.

3. BACKGROUND. The Global Positioning System (GPS) is a world-wide position, velocity, and time determination system operated by the Department of Defense that includes a satellite constellation and a ground control segment. The GPS has been accepted by the International Civil Aviation Organization (ICAO) as an integral part of the Global Navigation Satellite System (GNSS). Civil use of GPS for oceanic, en route, terminal, non-precision, and special precision approach flight has been authorized in the National Airspace System (NAS).

A special private use DGNSS ground facility is a subpart of a precision landing system installed, owned, operated, and maintained by a non-federal entity to support private use Special Instrument Approach Procedures. These facilities and the associated Special Instrument Approach Procedures are not available for general public use and shall be administered in accordance with FAA Order 8400.11, "IFR Approach for Differential Global Positioning System (DGPS) Special Category I Instrument Approaches Using Private Ground Facilities." Flight inspection may be required for both domestic and international locations.

SCAT-1 systems are available from several manufacturers and provide limited interoperability. FAA flight inspection aircraft cannot be equipped to analyze these systems due to the individual differences. Therefore, the manufacturer or user/sponsor shall provide the airborne and independent truth system equipment required for initial and recurring flight inspection evaluation. This equipment shall be capable of providing corrected aircraft position as real-time or post-processed data to an accuracy level necessary to satisfy all requirements established in this order.

Flight inspection will require a certified FAA Flight Inspector onboard the user/sponsor aircraft to observe the Special Instrument Approach Procedures and airborne data collection during both initial and periodic evaluations.

Distribution: A-W(AF/AT)-2, A-W(VN)-3, A-X(AF/AT/FS)-3, A-FFS-4(All), AMA-200, Special Military Addressees

Initiated By: AVN-230

4. RELATED MATERIAL.

a. FAA Order 8400.11, September 15, 1994, "IFR Approach for Differential Global Positioning System (DGPS) Special Category I Instrument Approaches Using Private Ground Facilities."

b. RTCA No. RTCA/DO-217, July 13, 1994, "Minimum Aviation System Performance Standards DGNSS Instrument System: Special Category I (SCAT-1)." Includes Changes 1 and 2.

c. RTCA No. RTCA/DO-208, July 1991, "Minimum Operational Performance Standards for Airborne Supplemental Navigation Equipment Using Global Positioning System (GPS)."

d. FAA Order 8200.1A, May 22, 1996, "United States Standard Flight Inspection Manual (USSFIM)."

5. FLIGHT INSPECTION PROCEDURES, ANALYSIS, AND TOLERANCES . Appendix 1 contains background material concerning the SCAT-1 system. Appendix 2 contains the flight inspection procedures, requirements, and analysis for SCAT-1 approaches. Appendix 3 contains definitions for flight inspection zones and points applicable to SCAT-1 approaches. Appendix 4 contains the records and reports required for SCAT-1 flight inspection. Appendix 5 contains required SCAT-1 flight inspection data.

6. INFORMATION UPDATE. Any deficiencies found, clarifications needed, or suggested improvements regarding the contents of this order should be noted on FAA Form 1320-19, Directive Feedback Information. If an interpretation is needed, call the originating office for guidance; however, you should also use FAA Form 1320-19 as a follow-up to the verbal conversation.

Joseph F. Doubleday
Acting Program Director of
Aviation System Standards

APPENDIX 1. BACKGROUND MATERIAL FOR DIFFERENTIAL GLOBAL NAVIGATION SATELLITE SYSTEM (DGNSS) SPECIAL CATEGORY I (SCAT-1) INSTRUMENT APPROACHES USING PRIVATE GROUND FACILITIES

The SCAT-1 system is comprised of four distinct functional segments: 1) the GNSS satellite constellation; 2) the differential ground subsystem; 3) the differential data link subsystem; and 4) the airborne subsystem.

The GNSS satellites provide the airborne and ground subsystems with positioning information and satellite peculiar data such as satellite identifier and health. This is the Standard Positioning Service (SPS) signal established on May 15, 1992, by a Memorandum of Agreement between the Department of Defense and the Department of Transportation.

The ground subsystem produces monitored differential corrections, integrity and (optionally) precision approach waypoint data. These corrections are based on known ground antenna points established at centimeter accuracy through specific survey requirements. The survey also establishes runway coordinates and elevations used in the precision instrument procedure generation. Differential corrections are determined relative to these known ground points. The ground system is subject to type acceptance by the Director of Airway Facilities Service, AAF-1.

The differential corrections and precision approach waypoint data are transmitted on the data link subsystem to the airborne subsystem for validation and processing. Private DGNSS data links used in the United States to support IFR operations shall use 25 kHz channels in the frequency spectrum from 112.0 MHz to 117.975 MHz. Data link continuity and monitoring are also subject to type acceptance by the Director of Airway Facilities Service, AAF-1. The data link signal-in-space is subject to verification based on airborne measurements during flight inspection.

The airborne subsystem receives and validates the differential data and then corrects the range measurements to each satellite with the differential correction received from the ground subsystem. This provides a more accurate determination of position, velocity, and heading. The differentially corrected aircraft position is then used with precision approach waypoint data obtained from the data link, to generate azimuth and glidepath guidance signals that drive appropriate aircraft systems such as displays, autopilots, and/or flight directors. Airborne equipment shall meet the applicable requirements specified in RTCA/DO-217, DGNSS MASPS, and be installed in accordance with AC 20-138 and AC 20-130A, or equivalent criteria. The airborne system is subject to certification by the Type Certificate or Supplemental Type Certificate process by the cognizant Aircraft Certification Office or Evaluation Group.

The SCAT-1 Special Instrument Approach Procedure development is based on existing ILS, MLS, LOC, or SDF criteria from FAA Order 8260.38, TERPS or ICAO PANS-OPS. The procedures will be developed by the National Flight Procedures Office, AVN-100.

The performance and monitoring of the system are based on the Required Navigation Performance (RNP) tunnel concept for precision approach. RNP is an airspace system function and not a navigation sensor function. This means the airspace requirements are satisfied independent of the methods by which they are achieved. The precision approach tunnel concept includes an inner and outer tunnel.

The inner tunnel (accuracy) dimensions define the 95% total allowable system error under normal conditions. This tunnel represents the permissible deviations of the aircraft center, and includes errors due to ground reference station, avionics, signal-in-space, and Flight Technical Error (FTE). The outer tunnel (containment) provides obstacle separation and defines a region around the approach path that no part of the aircraft should leave except by deliberate pilot action (incident probability of 10^{-7}).

Total System Error (TSE) is dependent on the architecture of the system. Error budget allocations vary in accordance with the particular system design. If the DGNSS system is not capable of providing the accuracy necessary to meet the RNP inner tunnel requirement, integrity alerts will be generated. Depending on the system error allocations, these alerts will be in the form of horizontal and/or vertical protection limit (HPL and VPL) alerts (flags). If both HPL and VPL flags occur, the pilot will generally elect to abandon the approach, but may select GNSS-only non-precision approach if the system provides a non-precision capability. When the non-precision approach is selected, the HPL flag will be removed and control of the display returned to the non-precision function. If a VPL only flag occurs, lateral guidance is still within tolerance and the pilot would be able to fly a lateral guidance-only approach (similar to a localizer-only approach), without deselecting the precision approach mode.

These alerts may be real-time or predicted. A predicted alert is based on calculations of future satellite geometry within the specified time required to complete the approach. A predicted alert shall be presented to the pilot prior to the final approach segment.

The intent of the SCAT-1 DGNSS is to provide the user with an ILS/MLS look-alike approach. Flight inspection criteria will ensure the procedure meets this requirement. Airborne evaluation of the Special Instrument Approach Procedure and underlying guidance parameters will be based on data provided by the user/sponsor. This airborne data will be analyzed by the Flight Inspector and a report provided to the Regional Airway Facilities Division Manager. Authorization for use of the system is the responsibility of the Flight Standards organization.

APPENDIX 2. FLIGHT INSPECTION EVALUATION OF SCAT-1 DGNSS SPECIAL INSTRUMENT APPROACH PROCEDURES

1. Introduction. This appendix presents flight inspection requirements for Special Category 1 DGNSS approaches. It is intended to provide guidance to the manufacturer, user/sponsor, and flight inspection personnel concerning the airborne data required for commissioning and periodic system evaluations. This policy is preliminary and may be revised as more experience with system performance is acquired.

2. Preflight Requirements. The Flight Inspector shall prepare for the flight inspection in accordance with FAA Order 8200.1A (USSFIM), Section 106.

The flight inspector shall be familiar with the airborne equipment operation, including guidance and alert displays of the user/sponsor aircraft.

The flight inspector shall be familiar with the airborne data acquisition system and the post-processing methodology utilized by the user/sponsor airborne system.

A SCAT-1 special approach procedure that is collocated with an existing precision approach will require the flight inspector to be familiar with both the special instrument approach procedure design and that of the underlying standard instrument approach procedure.

Operation in the terminal area may be performed by any approved navigation system. SCAT-1 approaches will require the HSI/CDI/OBS to be in the approach mode to provide azimuth and glidepath deviation signals. This may be done manually or automatically when the DGNSS approach mode is activated.

The Final Approach Segment (FAS) extends from the point at which the barometric altitude specified for the Intermediate Approach Segment (IAS) intersects the glidepath to the Decision Altitude DA(H) point on the glidepath. The glidepath is generated in the airborne equipment and extends through the Threshold Crossing Waypoint (TCWP) to the Ground Point of Intercept (GPI).

3. Flight Inspection Procedures.

3.1 Checklist.

Check	Reference
Initial Evaluation	
VHF Data Link	3.2.1
Initial and Intermediate Approach Segment	3.2.2
Final Approach Segment	3.2.3
Missed Approach Segment	3.2.4
Special Instrument Approach Procedure	3.2.6
Periodic Evaluation	3.3

3.1.1 Maintenance Procedures That Require a Confirming Flight Evaluation. A confirming flight inspection evaluation shall be required whenever the location of the DGNSS antenna phase center is changed, the location of the data link transmit antenna is changed, or the system database has been changed or corrupted. The extent of the evaluation shall depend on the changes made.

3.1.2 Zones and Points. Flight inspection of DGNSS SCAT-1 approaches shall be based on the zones and points described by the diagram and definitions in Appendix 3 of this order.

3.2 Commissioning Flight Inspection Evaluation. The special instrument approach procedure, DGNSS guidance parameters, and data link coverage shall be evaluated during initial flight inspection. Observation of ILS/MLS coincidence shall also be required for approaches that are collocated with existing ILS/MLS procedures. Data gathered during Type Certification (TC) or Supplemental Type Certification (STC) flights may satisfy many of the flight inspection requirements.

3.2.1 VHF Data Link (VDL). The minimum usable VDL signal shall be available throughout the operational coverage area defined below. (Figure 1)

Laterally: Beginning at 450 feet each side of the TCWP out to $\pm 10^0$ either side of the approach course at 20 nm, and;

Vertically: Beginning at the runway threshold and a point 20 feet above the TCWP out to ± one-half of the glidepath angle at 20 nm. The DGNSS ground facility operational service volume is required down to a height of 75 feet above the runway threshold.

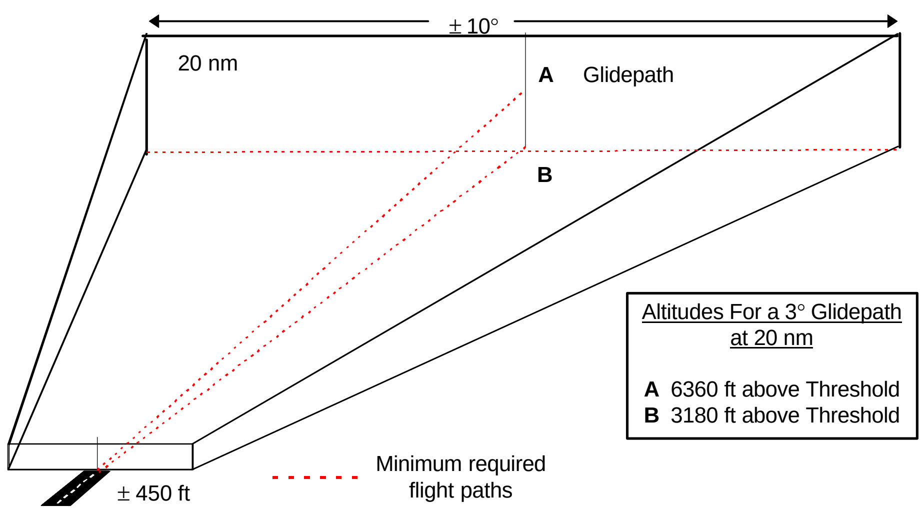


Figure 1. VHF Data Link Operational Service Volume

The minimum RF field strength shall be measured during normal data transmission, not averaged over the time intervals between signal transmissions. No data continuity alerts shall be allowed. Initial coverage check at minimum required field strength will establish the RF power alarm point. After coverage is verified, the RF power level of the VDL transmitter should be increased by at least 1 dB, but shall not exceed +43 dBm at the transmitter output.

Initial data link coverage shall be verified by flying a ± 10^0 arc at 20 nm from the runway threshold. The arc altitude shall correspond to 0.5 times the glidepath angle (for a 3.0^0 glidepath, this would be at 1.5^0 or 3,180 ft. HAT) or at the Minimum Vectoring Altitude (MVA), whichever is lowest. The coverage shall also be verified on and below the approach course and glidepath. Fly inbound along the final approach course from the service volume limit at an altitude that emulates half the glidepath angle or MVA, whichever is lowest. If the MVA is used, fly inbound, maintaining 500 feet above any obstacle, until intercepting half the glidepath angle, and descend through Point C to the TCWP.

3.2.2 Initial and Intermediate Approach Segments. Fly the entire procedure from the IAF to the PFAF. Maintain procedural altitudes. Evaluation shall include procedural design and data link coverage.

3.2.3 Final Approach Segment. Fly the final segment at procedural altitudes until intercepting the glidepath, then descend on the glidepath to the TCWP. Evaluation shall include procedural design, horizontal alignment, glidepath angle, and data link coverage. Corrected aircraft position data shall be provided by independent real-time or post-processed data. Procedures which support azimuth only approaches shall be evaluated through Point C.

3.2.4 Missed Approach Segment. Fly the missed approach procedure from the MAP using the procedural waypoints or associated NAVAIDS. Evaluation shall include procedural design and transition to the missed approach.

3.2.5 Collocated Approaches. Observe ILS/MLS guidance throughout the approach.

3.2.6 Special Instrument Approach Procedure. The special instrument approach procedure shall be evaluated to ensure flyability and safety. This evaluation and analysis shall be performed in accordance with FAA Order 8200.1A (USSFIM), Section 214. Procedures that are coincident with existing ground-based precision approaches do not require obstacle evaluations for the initial commissioning inspection.

3.3 Periodic Evaluation. Newly commissioned facilities shall be inspected on a progressive interval. The first periodic inspection shall be 90 days (± 15 days) after commissioning. The second inspection shall be 180 days (± 60 days) after the first periodic inspection, then continuing at 270-day (± 60 days) intervals. Requirements shall consist of the special instrument approach procedure verification and observation of data link performance throughout the final segment. Corrected aircraft position data shall be provided by independent real-time or post-processed data.

4. Flight Inspection Analysis.

4.1 Data Link. Initial evaluation shall require the data link signal strength be measured throughout the extremities of the defined service volume during normal data transmission with no data link alerts. Periodic evaluation shall require observation of data link availability with no alerts throughout the final segment.

4.2 Procedural Design and Database Integrity. Commissioning flight inspection shall require the approach path be evaluated to verify that the special instrument approach procedure delivers the aircraft to the desired aiming point. The true bearing and distance to each successive waypoint shall be compared to the procedural design and meet the tolerances in Section 5.

4.3 Satellite Parameters. The following satellite and GPS receiver/sensor parameters should be available for recording and analysis during the flight evaluation:

- **a.** Airborne GPS Receiver Signal-to-Noise Ratio
- **b.** Satellites tracked by the airborne receiver and their pseudo-range number (PRN)
- **c.** Horizontal and vertical dilution of precision (HDOP and VDOP) from the airborne receiver
- **d.** Date and time of day

There are no flight inspection tolerances applied to these parameters. However, they may provide useful information should GPS signal anomalies or interference be encountered.

4.4 Horizontal Alignment, Glidepath Angle, and Deviations. Horizontal alignment and glidepath angle shall be evaluated from the corrected aircraft position data for the final approach segment. An average will be calculated for the final segment. Glidepath and horizontal deviations shall be evaluated from the Graphical Average Path in Zone 1 and Zone 3. (Graphical Average Path is the average path described by a line drawn through the mean of all deviations. This will usually be a curved line which follows long-term trends (1,500 feet or greater) and averages shorter term deviations.) In Zone 2, the glidepath deviations shall be evaluated from the actual path angle and the horizontal deviations from the actual course alignment. Horizontal deviations from threshold to runway end shall be recorded and documented for future requirements.

4.5 Electromagnetic Spectrum. The RF spectrum from 1559 to 1595 MHz should be observed when GPS parameters indicate possible RF interference. Interference signals are not restrictive unless they affect receiver/sensor performance. Loss of differential data is an indication of interference, multipath, or shadowing of the VHF transmission. The RF Spectrum ± 100 kHz either side of the VDL frequency shall be observed on the spectrum analyzer in the case of suspected interference. Report any electromagnetic spectrum anomalies or suspected anomalies encountered in the GPS and VHF data link bands to the Program Director for Spectrum Policy and Management (ASR-1).

5. Tolerances.

5.1 Independent Reference System. Position data shall be obtained by an independent DGNSS or similar source capable of sub-meter accuracy.

5.2 Specific Parameter Tolerances.

Parameter	Reference	Tolerances
VHF Data Link Field Strength	4.1	275 µv/m (-97 dBW/m^2)
Initial/Intermediate Approach Segment Procedure Design Bearing to next WP Distance to next WP	 4.2 4.2	 ± 1.0° ± 0.1 nm
Zone 1 Deviations (Glidepath) Zone 1 Deviations (Horizontal)	4.4 4.4	± 0.14^0 ± 0.14^0

Parameter	Reference	Tolerances
Final Approach Segment		
Procedure Design		
Bearing to TCWP	4.2	± 0.1°
Distance to TCWP	4.2	± 0.1 nm
Glidepath Angle	4.4	+ .30^0/ -.225^0
Horizontal Alignment	4.4	± 0.2^0
Zone 2 Deviations (Glidepath)	4.4	± 0.14^0
Zone 2 Deviations (Horizontal)	4.4	± 0.40^0 at Pt A; linear decrease to ± 0.20^0 at Pt B
Zone 3 Deviations (Glidepath)	4.4	± 0.14^0
Zone 3 Deviations (Horizontal)	4.4	± 0.20^0
Missed Approach Segment (for GPS-based MA)		
Procedure Design		
Bearing to MAWP	4.2	± 1.0°
Distance to MAWP	4.2	± 0.1 nm

NOTE: Alignment and angle tolerances for the FAS are computed from the procedural glidepath angle and approach course. These values are based on the TCWP and GPI for glidepath, and the procedural origination point of the horizontal guidance.

6. Records, Reports, and Notices to Airmen. See Sections 107 and 108 of the USSFIM. Commissioning and periodic evaluation data shall be provided to the responsible Regional Airway Facilities Division Manager, the responsible Flight Inspection Office or International Flight Inspection Office, and to Flight Inspection Policy and Standards, AVN-230, to facilitate the compilation of historical data for DGNSS operations. The required forms for SCAT-1 evaluations are contained in Appendix 4. The following plots shall be provided by the user/sponsor for analysis within 30 days following the completion of the flight check. If the data is not provided within 30 days by the user/sponsor, the flight inspector may NOTAM the facility out of service until the data is provided.

a. **Field strength for the normal approach,** 20 - 0 nm (Appendix 5, Figure 1)

b. **Field strength for the low approach,** 20 - 0 nm (Appendix 5, Figure 1)

c. **Field strength for the arc,** 20 nm (Appendix 5, Figure 1A)

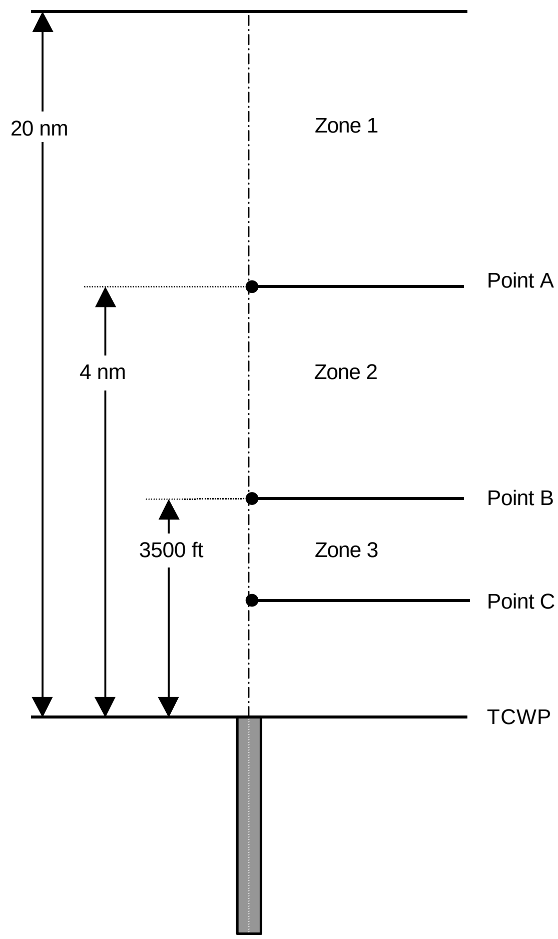
d. **Horizontal angular deviations for a normal approach,** 20 - 0 nm (Appendix 5, Figure 2)

e. **Glidepath angular deviations for a normal approach,** 20 -0 nm (Appendix 5, Figure 3)

f. **Horizontal Navigation Sensor Error (NSE) for normal approach,** 6 - 0 nm (Appendix 5, Figure 4)

g. **Glidepath Navigation Sensor Error for a normal approach,** 6 - 0 nm (Appendix 5, Figure 5)

APPENDIX 3. DEFINITION OF SCAT-1 POINTS AND ZONES



The following definitions for flight inspection points and zones shall apply to analysis of SCAT-1 flight inspection data:

Point A. A point on-course located 4 nm from the runway threshold measured along the runway centerline extended.

Point B. A point on-course located 3500 feet from the runway threshold measured along the runway centerline extended.

Point C. A point through which the glidepath (as commissioned) passes at a height of 100 feet above the horizontal plane containing the runway threshold. For operations without a glidepath, Point C is the Missed Approach Point (MAP).

Zone 1. The distance from the VDL coverage limit (20 nm) to Point A on-course.

Zone 2. The distance from Point A to Point B on-course.

Zone 3. The distance from Point B to Point C on-course.

APPENDIX 4. FLIGHT INSPECTION REPORT - SCAT-1 DIFFERENTIAL GPS (DGPS) FAA FORM 8240-5-3

This report shall be used for reporting all site, commissioning, periodic, special, and other inspections.

When the SCAT-1 Differential GPS system serves more than one airport, a separate report shall be required for each airport. **Record the following information:**

a. Field 1 - Location. Complete as shown in the current edition of Instructions for Flight Inspection Reporting, FAA Order 8240.36, Chapter 2, Paragraph 12.

b. Field 2 - Identification (Ident). Enter the airport ident.

c. Field 3 - Date/Dates of Inspection. Complete as shown in the current edition of FAA Order 8240.36, Chapter 2, Paragraph 12.

d. Field 4 - Type of Inspection. Complete as shown in the current edition of FAA Order 8240.36, Chapter 2, Paragraph 12.

e. Field 5 - Approach Data.

(1) Runway. Enter the runway number served by the GPS approach being inspected.

(2) Glidepath. Enter the commissioned glidepath angle.

(3) Glidepath Course Deviations - Zone 1, Zone 2, and Zone 3. Report the maximum course displacement error in hundredths of a degree for each zone and the distance from the threshold (e.g., .03/.8 indicates the course displacement was .03 degrees at .8 nm). When necessary to more accurately locate a deviation value in a particular zone, report mileage to the nearest hundredth.

(4) Glidepath. Enter the measured actual vertical angle to the nearest one hundredth of a degree. If the reported angle is not the actual angle, explain in Field 7.

(5) Horizontal. Enter the true front course bearing.

(6) Horizontal Course Deviations - Zone 1, Zone 2, and Zone 3. Report the maximum course displacement error in hundredths of a degree for each zone and the distance from the threshold (e.g., .06/.8 indicates the course displacement was .06 degrees at .8 nm). When necessary to more accurately locate a deviation value in a particular zone, report mileage to the nearest hundredth.

(7) Alignment. Enter the course displacement in hundredths of degrees left or right of the desired course (e.g., .04 R is four hundredths of a degree right of the course, enter “CL” for no alignment error). For offset facilities, reference the alignment to the designed azimuth alignment.

(8) Data Link. If the data link is satisfactory (demonstrates availability with no alerts), enter as “S”; if unsatisfactory, enter a “U” and explain in Field 7.

(9) Standard Instrument Approach Procedure (SIAP) - After checking a SIAP for compliance with Order 8200.1A, United States Standard Flight Inspection Manual, Section 214, enter an “S” if satisfactory, or a “U” if unsatisfactory. Explain unsatisfactory performance in the Remarks section (Field 6).

(10) Approach Lighting System. Enter the status of the lighting system. If satisfactory, enter a “S”; if unsatisfactory, enter a “U” and explain in Field 7.

(11) DGPS Control Number. Enter the DPGS Control Number listed on the PC form of the procedure package.

f. Field 6 - Remarks. Complete as defined in Chapter 3.

FLIGHT INSPECTION REPORT - SCAT-1 DIFFERENTIAL GPS (DGPS)

FAA FORM 8240-5-3

FLIGHT INSPECTION REPORT-- SCAT-1 DGPS						REVIEW INITIALS
1. LOCATION:						2. IDENT:
	3. DATE(S) OF INSPECTION:					
4. TYPE OF INSPECTION		COMMISSIONING		SURVEILLANCE		INCOMPLETE
		PERIODIC		SPECIAL		

5. APPROACH DATA						
RUNWAY						
GLIDEPATH (DESIRED ANGLE)						
ZONE 1						
ZONE 2						
ZONE 3						
GLIDEPATH (ACTUAL ANGLE)						
HORIZONTAL TRUE FRONT COURSE BEARING						
ZONE 1						
ZONE 2						
ZONE 3						
ALIGNMENT						
DATA LINK (SAT/UNSAT)						
SIAP						
LIGHTS						
DGPS CONTROL NO.						

6. REMARKS:

APPROACH STATUS		NOTAMs:		
UNRESTRICTED				
RESTRICTED				
UNUSABLE				
REGION:		FLIGHT INSPECTOR 'S SIGNATURE:	TECHNICIAN 'S SIGNATURE:	AIRCRAFT NO:

FAA FORM 8240 - 5 - 3 (7/98) (FORMFLOW) (Supersedes previous edition)

APPENDIX 5. DATA PLOTS

Figure 1. Field Strength

XXX 22L, 6380 AGL(6400 MSL), 3.0 degree Glide Slope

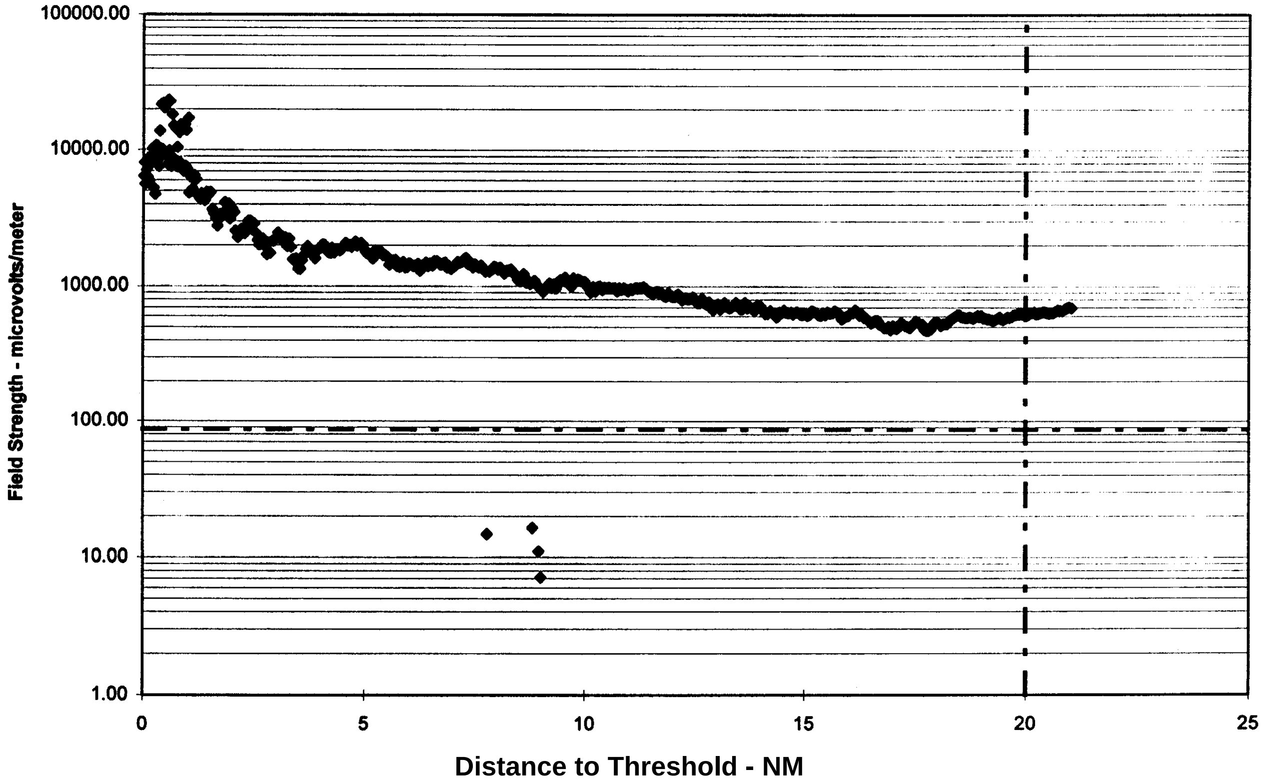


Figure 1A. Field Strength

XXX 22L, 3180 AGL(3200MSL), 20 NM arc/+10 to -10 degrees of Runway Centerline

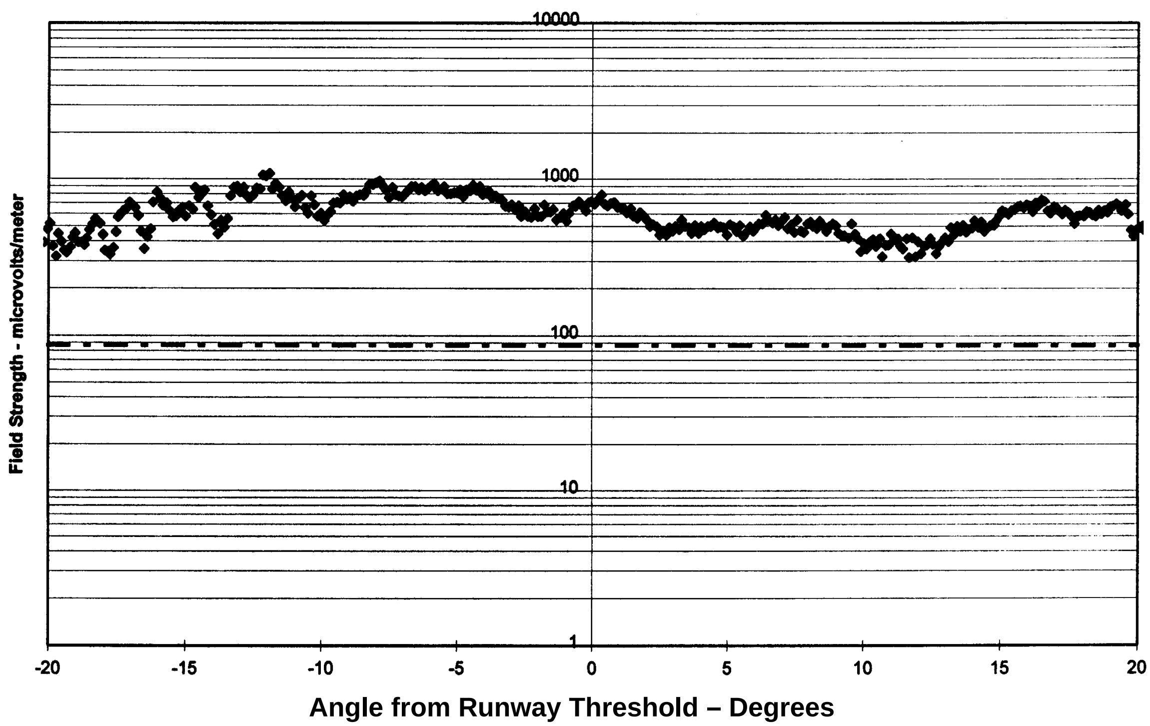


Figure 2. Horizontal Angular Deviations

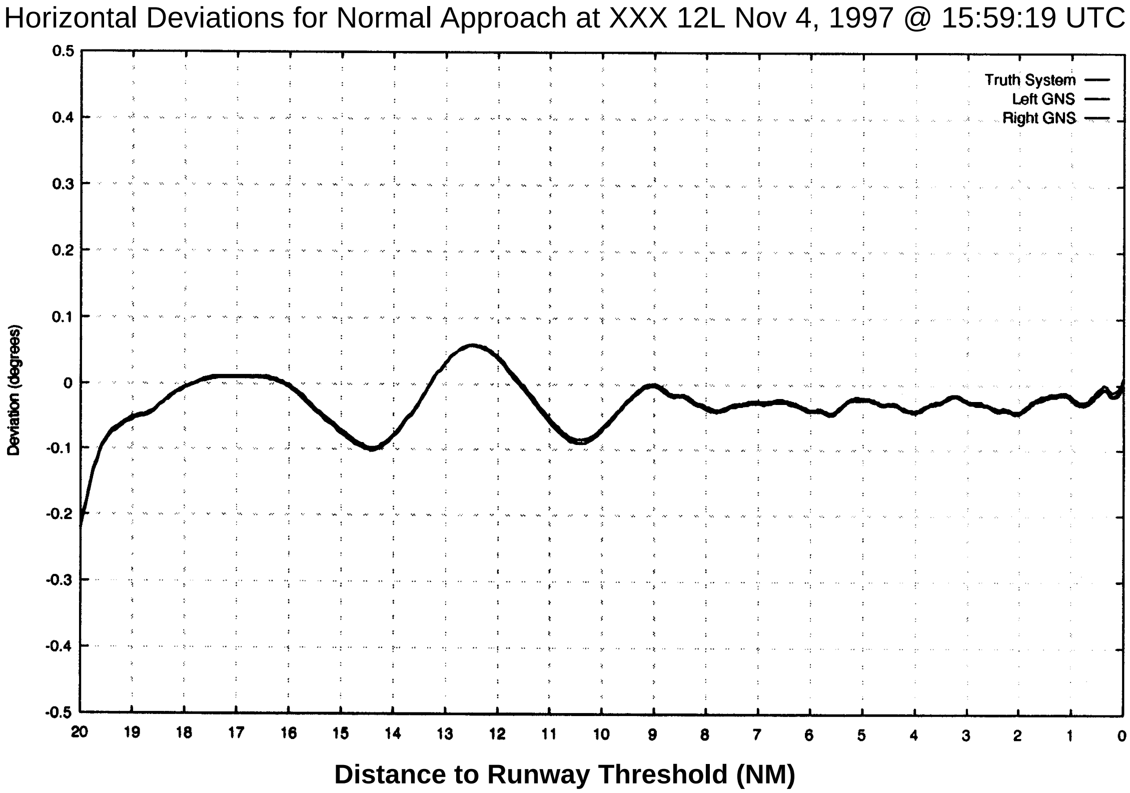


Figure 3. Glidepath Angular Deviations

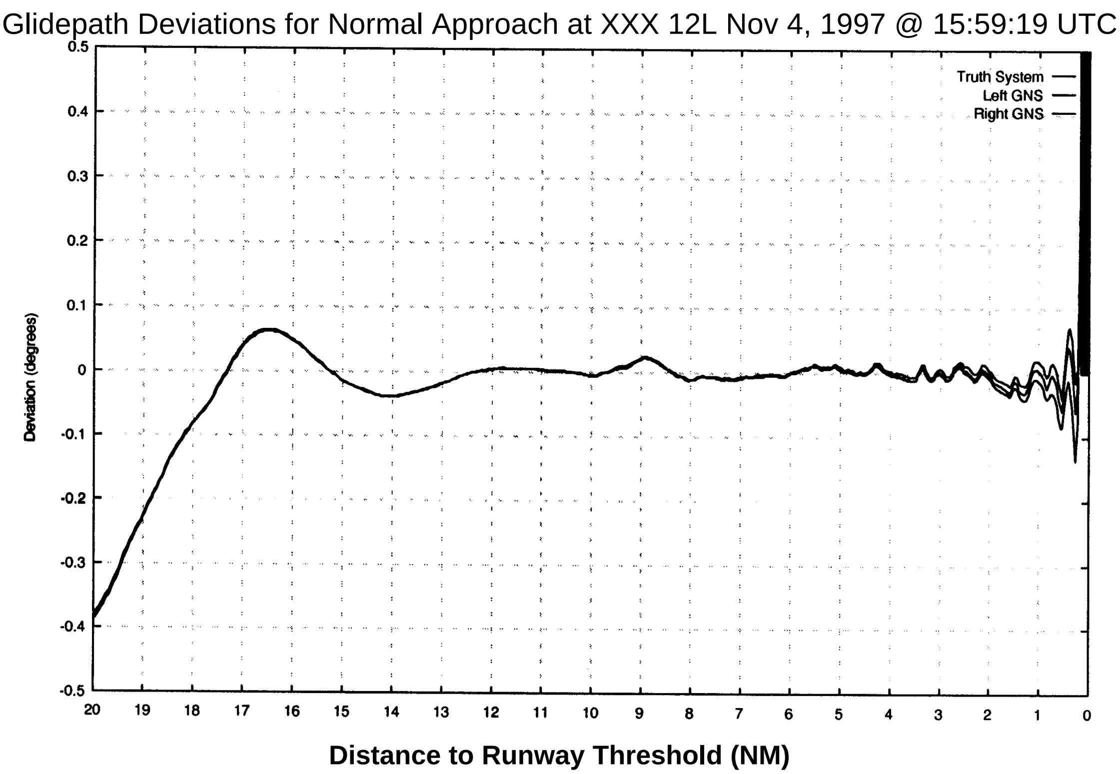


Figure 4. Horizontal Navigation Sensor Error (NSE)

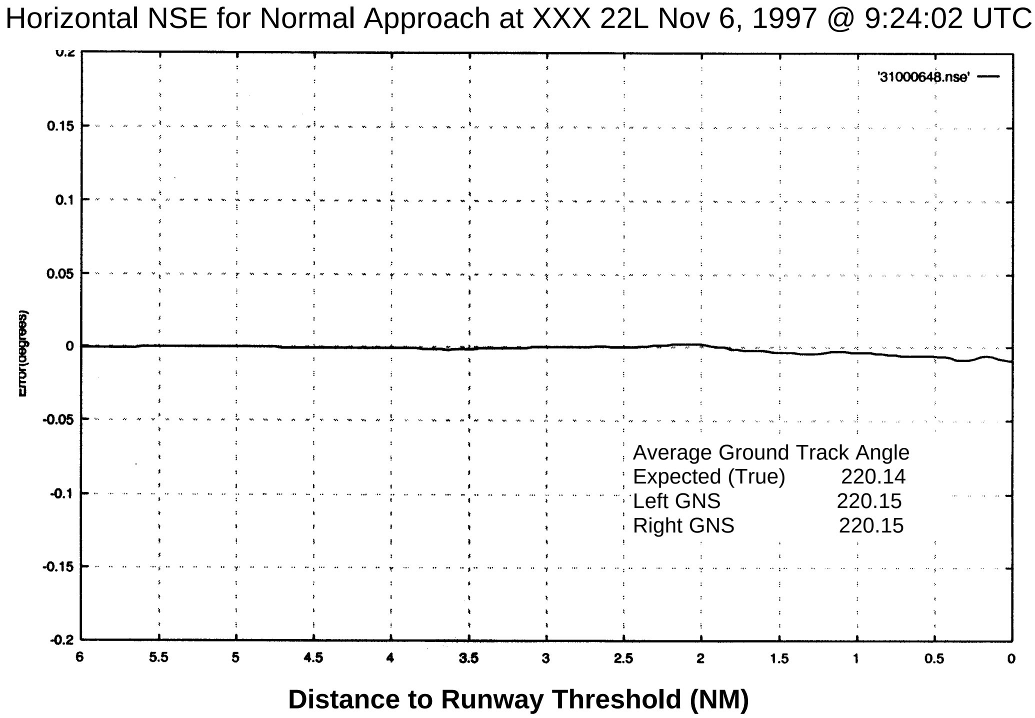


Figure 5. Glidepath Navigation Sensor Error (NSE)