CHANGE

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

8260.19C CHG 2

12/29/99

SUBJ: FLIGHT PROCEDURES AND AIRSPACE

1. PURPOSE. This change transmits revised pages to Order 8260.19C, Flight Procedures and Airspace.

2. DISTRIBUTION. This order is distributed in Washington headquarters to the branch level in the Offices of System Safety, Aviation Policy and Plans, Air Traffic Systems Development, Aviation Research, Communications, Navigation, and Surveillance Systems, Airport Safety and Standards; to Flight Standards, Air Traffic, and Airway Facilities Services; to the Aeronautical Information Division (ATA-100); to the National Flight Procedures Office (AVN-100), the National Airway Systems Engineering and the Regulatory Standards Divisions at the Mike Monroney Aeronautical Center; to the branch level in the regional Flight Standards, Air Traffic, Airway Facilities, and Airports Divisions; to all Flight Inspection Offices; International Flight Inspection Office; the Europe, Africa, and Middle East Area Office; to all Flight Standards and Airway Facilities Field Offices; special mailing list ZVN-826; and Special Military and Public Addressees.

3. EFFECTIVE DATE. May 15, 2000.

4. EXPLANATION OF CHANGES. Chapters 4, 5, 6, and 7 are rewritten to reflect organizational changes and reassignment of responsibilities of the Flight Standards Service and the Aviation System Standards (AVN). Policy and responsibilities are also revised to reflect current policy and terminal instrument procedures (TERPS) instruction letters.

a. Chapter 2.

(1) Paragraph 223a. Revises AVN-100 - National Flight Data Center (NFDC) coordination procedures for FDC Notice to Airmen (NOTAM) transmittal.

(2) Paragraph 224. Updates NOTAM policy for departure procedures (DP's).

(3) Paragraph 264. Updates information relating to naming navigational fixes to satisfy the requirements of Order 8260.40B, Flight Management System.

b. Chapter 4.

(1) Paragraph 404. Updates information to reflect modifications made in Order 8260.3B CHG 17, United States Standard for Terminal Instrument Procedures (TERPS).

(2) Paragraph 421. Modifies latter portion of paragraph to reflect evaluation and disposition of user comments.

Distribution: A-W(SY/PO/UA/AR/ND/AS/AT/FS/AF)-3; ATA-100(15CYS); AVN-100(150CYS); AOS-200(10CYS); AMA-200(80CYS); A-X(FS/AT/AF/AS)-3; A-FFS-O (STD); AEU-1(10CYS); A-FAF-O(STD); ZVN-826; Special Military and Public Addressees

Initiated By: AFS-420

(3) Paragraph 430. Clarifies establishment of visual descent point (VDP).

(4) Section 4. Terminates the use of commercial broadcast stations for instrument procedure development. Section RESERVED for Special Procedure processing instructions.

(5) Section 7. Updates information relating to instrument departure procedures to bring the order in consonance with Order 8260.46, Instrument Departure Procedure (DP) Program. Defines policy for DP development, provides specifications for textual versus graphic departures, and provides methodology for publication of both obstacle and ATC required altitudes/climb gradients.

(6) Section 8. Removes all references to Standard Instrument Procedures (SID's) and clarifies AVN-100 responsibilities relating to Standard Terminal Arrival Routes (STAR's).

c. Chapter 5.

(1) Paragraph 501. Changes and reassigns the responsibilities of AVN-100, and adds the responsibilities of the All Weather Operations Program Managers in the Regional Flight Standards Divisions.

(2) Paragraph 502. Defines procedures for obstruction evaluations (OE) more clearly and updates responsibilities to reflect recent organizational changes.

(3) Paragraph 506. Clarifies AVN-100 actions.

(4) Paragraph 507. Changes text and graphics to more clearly define controlled airspace requirements.

d. Chapter 6.

(1) Paragraph 600. Adds U.S. Navy address for official inquiries.

(2) Paragraph 601. Emphasizes importance and responsibility of documenting/ maintaining military fixes.

e. Chapter 7.

(1) Paragraph 701d. Incorporates regional level of responsibility.

(2) Paragraph 702. Provides a more concise list of operational benefits/improvements.

(3) Paragraph 703. Provides more extensive information for performing a safety analysis.

(4) Paragraph 706a(5). Adds information concerning an unsuccessful flight check.

(5) Paragraph 706e. Adds drawing concerning "Stand-Alone Fix on Localizer Course."

(6) Section 8. Provides more information regarding the responsibility for Facilities and Equipment (F&E) support.

f. Chapter 8.

(1) Paragraph 815g. Adds requirement for AVN-100 to ensure a missed approach procedure is available during NAVAID outages.

(2) Paragraph 816l(1). Adds more definitive guidance in the Standard Notes for area navigation (RNAV) glide slope.

(3) Paragraph 816n(4). Adds information concerning magnetic variation of departure procedures.

g. Appendix 1. Updates Flight Procedures' references, and adds U.S. Army Topographic Units to accuracy codes and sources.

h. Appendix 2.

(1) Paragraph 101a. Deletes the requirement to list the accuracy code(s) on 8260 series forms, but the actual adjustment(s) is documented.

(2) Paragraph 101b(2)(b). Expands Department of Defense (DOD) sources to include digital elevation data and tactical flying charts and defines accuracy more clearly.

(3) Paragraph 101b(6). Adds accuracy code requirements under digital terrain.

5. DISPOSITION OF TRANSMITTAL. After filing, this change transmittal should be retained.

PAGE CONTROL CHART

REMOVE PAGES	DATED	INSERT PAGES	DATED
iii thru xiii	9/16/93	iii thru xiii	12/29/99
1-3 and 1-4	9/18/98	1-3 and 1-4	12/29/99
2-11 thru 2-16	9/18/98	2-11 thru 2-16	12/29/99
2-21 and 2-22	9/18/87	2-21	12/29/99
		2-22	9/18/98
2-25 and 2-26	9/18/98	2-25 and 26	12/29/99
3-7 and 3-8	9/18/98	3-7	12/29/99
		3-8	9/18/98
4-1 thru 4-19	9/16/93	4-1 thru 4-18	12.29/99
5-1 thru 5-22	9/16/93	5-1 thru 5-21 (and 5-22)	12/29/99
6-1 (and 6-2)9/16/93		6-1 (and 6-2)	12/29/99
7-1 thru 7-13	9/16/93	7-1 thru 7-14	12/29/99
8-23 thru 8-26	9/16/93	8-23 thru 8-26	12/29/99

PAGE CONTROL CHART

REMOVE PAGES	DATED	INSERT PAGES	DATED
APPENDIX 1 1 thru 5	9/16/93	APPENDIX 1 1 thru 5 (and 6)	12/29/99
APPENDIX 2 1 thru 4	9/16/93	APPENDIX 2 1 thru 5 (and 6)	12/29/99

L. Nicholas Lacey
Director, Flight Standards Service

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b. Computer Generated Forms. Most FAA forms used in the development of instrument procedures can be automated through the use of an approved electronic forms software package.

(1) Implementation. The implementation of this system will reduce the errors and tedium of filling procedures forms either by hand or the typewriter. This system also allows information to be extracted from sources such as text files and other databases.

(2) Use of Automated Forms. This automated process allows each user to fill in forms completely and accurately, and to print the forms. The Flight Procedure Standards Branch, AFS-420, provides administrative control over any modification of the automated forms. Direct any recommendations for changes or modifications to AFS-420 with a courtesy copy to the Automation Technology Branch, AVN-22A.

(3) Equipment Requirements. Each user office must have access to the appropriate hardware/software to use automated electronic forms software. Contact AVN-22A for more specific requirements.

(4) System Description. This electronic form processor has a visual interface and allows each user to work with forms using windows, pictures, and menus on a screen. The completed screen data and form may be printed on bond paper.

c. IAPA Generated Forms. Refer to chapter 2, section 13.

105. TERMS AND DEFINITIONS.

For the purpose of this order, flight procedures are identified as the functions for predetermining safe and practical methods of navigating aircraft which prescribe intended flight tracks, operational altitudes, and arrival/departure minimums. Flight procedures are subdivided into six general categories as follows: departure procedure, en route, instrument approach, missed approach, holding, and fix descriptions. The following words have the meaning shown:

a. May – action is permissible

b. Shall - action is mandatory.

c. Should – action is desirable.

d. Will – indicates a presumption that action is to be taken**.**

e. AWOP – All Weather Operations Program.

f. 14 CFR – Title 14 of the Code of Federal Regulations.

g. FICO – Flight Inspection Central Operations Office, AVN-250.

h. Flight Inspection Operations Division, AVN-200.

i. FPO – Flight Procedures Office.

j. IAPA – Instrument Approach Procedures Automation.

k. Miles – nautical miles unless otherwise specified.

l. NFDC – National Flight Data Center, ATA-110.

m. NTAP – Notices to Airmen Publication.

n. NFPO – National Flight Procedures Office, AVN-100**.**

o. SIAP – Standard Instrument Approach Procedure.

p. USNOF – U.S. NOTAM Office.

106. INFORMATION CURRENCY.

a. Forward for consideration any deficiencies found, clarification needed, or suggested improvements regarding the contents of this order to:

DOT/FAA
Flight Procedure Standards Branch, AFS-420
P.O. Box 25082
Oklahoma City, OK 73125

b. Your assistance is welcome. FAA Form 1320-9, Directive Feedback Information, is included at the end of this order for your convenience If an interpretation is needed immediately, you may call the originating office for guidance. However, you should use the FAA Form 1320-9 as a follow-up to the verbal conversation.

c. Use the "Other Comments" block of this form providing a complete explanation of why the suggested change is necessary.

107-109. RESERVED

SECTION 6. NOTICES TO AIRMEN (NOTAM)

220. GENERAL.

NOTAM's provide timely knowledge to airmen, and other aviation interests, of information or conditions which are essential to safety of flight. NOTAM's pertaining to instrument procedures remain in effect until the pertinent charts and publications are amended or the condition requiring the NOTAM ends. This section deals primarily with procedures for issuing Flight Data Center (FDC) NOTAM's which are required to maintain the accuracy and currency of charted terminal and en route flight procedures.

221. NATIONAL NOTICE TO AIRMEN SYSTEM.

A National Notice to Airmen System has been established to provide airmen with the current status of the National Airspace System (NAS). Details for handling this information are contained in Order 7930.2, Notices to Airmen. The following is a brief summary of the services provided:

a. FDC NOTAM's pertaining to instrument flight procedures are issued through the National Flight Data Center (NFDC*)* and are primarily used to disseminate safety of flight information relating to regulatory material. They may also be used to provide wide dissemination for flight procedures data, aeronautical information, and other time-critical information. They are numbered by the U.S. NOTAM Office (USNOF) to reflect the year of issuance and the sequence number for the calendar year, (e.g., 8/0445). FDC NOTAM's are transmitted on all Service A circuits, and stored in the Consolidated NOTAM System, after which they are entered in the Notices to Airmen Publication (NTAP), also referred to as the "Class II (mail distribution) publication" until canceled.

b. D NOTAM's issued under the Flight Service Stations' Accountability System receive the same dissemination as the surface weather report for the originating station, and provide the user with current information on an hourly basis. They are numbered to reflect the month of issuance and the sequence number of the month, (e.g. 6/18).

222. FDC NOTAM TYPES.

Changes to instrument flight procedures, which have been charted and distributed, may be processed as FDC NOTAM's and issued through NFDC. Procedural minimums shall not be lowered by NOTAM unless fully justified as a safety of flight issue. In order to identify procedural amendments that can be charted from the NOTAM information, AVN-100 personnel shall prefix the text with an action code as follows:

a. FI/P (Flight Information/Permanent). This prefix shall be used when the amended procedure is expected to be effective for more than 4 charting cycles (224 days). FI/P-NOTAM's (P-NOTAM's) contain information that is complete for charting purposes. Cartographic agencies will initiate immediate changes to charted information, based upon the P-NOTAM data, prior to receiving from NFDC the formal amendment to the appropriate procedure. Only one SIAP shall be addressed per P-NOTAM. P-NOTAM's may NOT be used for Airway changes. Refer to paragraphs 224b, c, and d for DP and STAR NOTAM procedures.

FI/P-NOTAM's may be used to amend procedures without a complete review of the procedure. The amendment will be indicated by an alphanumeric identifier; e.g., Amdt 3A, Amdt 4C, etc. A hard copy of each P-NOTAM shall be affixed to the current amendment and maintained in the procedures file by both the NFDC and AVN-100, for each SIAP until the next full amendment is effective.

b. FI/T (Flight Information/Temporary). Use this prefix when the amended procedure will be effective for less than 4 charting cycles (224 days). If, at any time, it is determined that the condition is expected to last longer or will become permanent, amend the procedure via an FI/P-NOTAM or revised 8260-series form. The P-NOTAM or 8260-series form should be submitted prior to the expiration of the temporary timeframe.

223. FDC NOTAM PREPARATION, REVIEW AND TRANSMITTAL.

a. AVN-100 is responsible for formulating procedural and airway FDC NOTAM's and forwarding them for transmittal. The following procedures apply:

(1) Coordinate all FDC NOTAM's with the affected ARTCC facility and the appropriate regional offices at the time of submission, or if unable, during the next normal workday (See also Order 8260.3, paragraph 150). Normally, AVN-100 should also notify the airport manager at the affected location.

NOTE: The ARTCC will ensure that the NOTAM's are forwarded to all affected ATC facilities under Order 7930.2F, paragraph 2-2-3.

(2) AVN-100 shall establish procedures to ensure that *all* NOTAM's are reviewed for accuracy, completeness, content, etc. prior to submission.

(3) Call NFDC to ensure a specialist is available to receive the NOTAM Once assured, submit NOTAM's to the NFDC via facsimile (FAX). A typewritten or legible handwritten copy is required; however, a telephone call is acceptable in emergencies. A record of a successful FAX transmittal after the phone call assures receipt.

(4) During periods when NFDC is closed or a specialist cannot be contacted, FAX the NOTAM directly to the USNOF. The NOTAM originator is responsible for ensuring USNOF receipt.

(5) Ensure that a copy of all FDC NOTAM's sent directly to the USNOF is clearly annotated that it has been sent directly to the USNOF and also sent to NFDC via FAX at the time of transmittal. This will preclude duplication and confusion.

b. NFDC is responsible for reviewing applicable FDC NOTAM's for accuracy, format, completeness, and data base agreement prior to forwarding them to the USNOF for transmittal. Discrepancies noted by NFDC will be resolved through the originating AVN-100 branch. NFDC is also responsible for compiling NOTAM's for inclusion in the Notices to Airmen Publication (NTAP) and follow up actions noted in paragraph 227.

c. The USNOF is also responsible for ensuring that FDC NOTAM's are in the proper format under this directive and Order 7930.2. Questions/ discrepancies will be addressed to the submitting agency, NFDC, or AVN-160 as appropriate. FDC NOTAM's affecting FAA developed military SIAP's at civil locations shall be issued separately and forwarded to the USNOF military representative.

d. Cartographic Standards Branch, ATA-130, is responsible for issuing, tracking, and canceling FDC NOTAM's used to correct/amend U.S. government IFR en route and VFR sectional aeronautical charts when necessary to resolve charting errors.

224. INSTRUMENT PROCEDURE NOTAM's.

a. A complete review and a new amendment are the preferred methodology for permanent procedure changes, particularly when applying new or revised TERPS criteria. However, it is recognized that this may not always be possible due to workload, staffing level, etc. P-NOTAM's have proven to be an effective means of updating aeronautical charts within the following guidelines:

(1) There is no age limit on a SIAP submitted for P-NOTAM amendment as long as AVN-100 reviews it and ascertains that there are no other safety of flight changes required to the procedure. Do NOT prepare a NOTAM solely to address minor non-safety related discrepancies to a SIAP; however, if a NOTAM is required for safety reasons, other items may be included in the P-NOTAM to simultaneously update procedure charts.

(2) AVN-100 may issue P-NOTAM's for consecutive amendments to the same procedure. All P-NOTAM amendments shall be sequentially lettered (e.g., Amendment 13A, 13B, 13C, etc.) as a suffix to the current amendment.

(3) Exercise caution in adding P-NOTAM's to a procedure or when initiating a P-NOTAM when there is a current T-NOTAM in effect for the procedure. In many cases close follow-up action, including canceling and reissuing NOTAM's, will be necessary to ensure there is no confusion for pilots and chart producers.

Examples:

The currently published SIAP is AMDT 3. There is a T-NOTAM in effect for AMDT 3 that will remain in effect after AMDT 3A is charted. When AMDT 3A is charted, the T-NOTAM must be canceled and reissued for AMDT 3A.

The currently published SIAP is AMDT 4A. A P-NOTAM has been issued, but not yet charted promulgating AMDT 4B. Another P-NOTAM is required that will promulgate AMDT 4C. In this case, because AMDT 4B is not yet charted, issue a T-NOTAM against the currently charted procedure (AMDT 4A). When AMDT 4B is charted, cancel the T-NOTAM and reissue it as a P-NOTAM promul-gating AMDT 4C.

(4) Issue a T-NOTAM and amend the SIAP as a priority to the AVN-100 work schedule, when all changes and corrections cannot be accommodated using a P-NOTAM.

(5) When changes to civil procedures also affect FAA-developed military procedures at civil or joint-use airfields, AVN-100 shall issue a separate FDC NOTAM for the military procedure as specified in Orders 8260.15, United States Army Terminal Instrument Procedures Service, and 8260.32, United States Air Force Terminal Instrument Procedures Service. AVN-100 shall request the USNOF to forward the civil NOTAM and the reason to the cognizant military authority for appropriate military NOTAM action.

(6) NOTAM requirements for FAA developed U.S. Army procedures at military airfields will be processed under Order 8260.15.

b. Changes to textual DP's shall be issued under the FDC NOTAM process as outlined under paragraph 223. Only FI/T-NOTAM's may be issued. Permanent procedural changes to textual DP's must be made via a new or amended Form 8260-15A within 224 days of the issuance of the associated NOTAM.

c. Changes to graphic DP's (formerly SID's) shall be promulgated as NOTAM (D)'s under Order 7930.2. These NOTAM's are developed by AVN-100 and are issued by the USNOF using the accountability code "USD." The following format examples are provided:

USD 12/001 SAN BORDER THREE DEPARTURE JULIAN TRANSITION: FROM OVER BROWS INT VIA JLI R-182 TO JLI VORTAC.

USD XX/XXX LAX CHATY TWO DEPARTURE, GORMAN TRANSITION: MINIMUM ALTITUDE BROWS, INT TO GMN VORTAC, 8000 FT.

In the first example above, "USD**"** is the NOTAM accountability code; "12/001" is the NOTAM number which is assigned by the USNOF (first NOTAM (D) issued in December); "SAN" indicates the three-letter airport identifier; the remainder is the NOTAM text.

(1) The following procedures shall be followed when a NOTAM (D) for a DP is required:

(a) AVN-100 shall forward the NOTAM text directly to the USNOF via facsimile for transmittal.

(b) For multiple airport DP's, a separate NOTAM (D) must be prepared for each airport affected by the DP.

(c) Temporary and permanent conditions may be promulgated via the NOTAM (D) process; however, NOTAM (D)'s shall not be used as a source to effect charting changes. Permanent procedural changes to graphic DP's must be made via a new or amended FAA Form 8260-15B within 224 days of the issuance of the associated NOTAM (D).

(d) The USNOF shall review each NOTAM to ensure formatting, contractions, etc. are correct and assign the NOTAM number. Questionable items must be resolved with the originator prior to issuance.

(e) Once issued, AVN-100 shall be responsible for obtaining the NOTAM number from the USNOF, tracking, and canceling the NOTAM when the condition requiring the NOTAM is no longer applicable.

d. Changes to STAR's requiring NOTAM action are also promulgated as NOTAM (D)'s. The appropriate ARTCC retains the responsibility for initiating, tracking, and canceling NOTAM (D)'s for STAR's.

e. General NOTAM (D) Actions.

(1) When a NOTAM (D) is issued closing an airport permanently, an FDC NOTAM need not be issued denying use of a SIAP. A routine procedure cancellation should be processed.

(2) When a NOTAM (D) is issued to shut down a facility permanently, only routine cancellation of procedures predicated on that facility are required. FDC NOTAM's may be required for other procedures supported by the affected facility.

(3) When a NOTAM (D) is issued closing a runway, an FDC NOTAM need not be issued denying straight-in minimums to that runway. If the closing is permanent, routine procedure cancellations, including takeoff/departure procedures, shall be processed.

(4) When a NOTAM (D) is issued for a facility shutdown or outage, an FDC NOTAM denying SIAP use is not required for those SIAP's using only that facility. However, other SIAP's in the vicinity must be reviewed to determine if that facility supports courses or fixes; in such cases, those SIAP's require an FDC NOTAM. Particular attention must be given to fixes supporting stepdown minimums and missed approach procedures which are predicated on the out-of-service facility. It is not necessary to issue NOTAM's for fixes and terminal route segments which are related to unusable airway segments from the subject facility. Do not issue "Radar Required" NOTAM's on unusable or restricted airway segments (see also paragraph 463).

When an instrument approach procedure is NOTAMed for an outage of an NDB or DME facility providing ancillary support, (not providing final approach course guidance), exempt aircraft equipped with IFR GPS systems from the restriction. For clarification, state the reason for the restriction in the text of the NOTAM. An example for use when a DME antenna is out of service: 'DME MINIMUMS NA EXCEPT FOR IFR GPS-EQUIPPED AIRCRAFT, ORD DME OTS." An example of an ILS approach that uses an LOM for procedure entry and/or missed approach clearance limit: 'PROCEDURE NA EXCEPT FOR IFR GPS-EQUIPPED AIRCRAFT, FOR LOM OTS."

(5) When a NOTAM (D) removes a localizer from service, the SIAP is unusable. If the GS is out, the precision approach is unusable. If other ILS components are out, the inoperative table applies.

(6) When radio control of approach lights or runway lights is commissioned or the frequency is changed, Flight Inspection issues a NOTAM (D) in accordance with Order 8200.1, United States Standard Flight Inspection Manual.

225. AIRWAY NOTAM's.

When a restriction or a change to an airway requires a NOTAM, forward an FDC T-NOTAM to NFDC following the procedures in paragraph 223. NOTAM's, reflecting airway changes within one or more ARTCC's airspace, are issued under the affected ARTCC identifier as Center Area NOTAM (CAN) FDC NOTAM's on the NOTAM circuit.

a. Airway changes involving a single state and one or more ARTCC's shall be issued with the ARTCC identifier followed by the two-letter state code. The two-letter state code must also follow all NAVAID and fix designators.

Example:

"FDC 8/0001 ZFW OK FI/T AIRWAY ZFW ZKC. V140 SAYRE (SYO) VORTAC, OK TO TULSA (TUL) VORTAC, OK MEA 4300.

FDC 8/0002 ZKC OK FI/T AIRWAY ZFW ZKC. V140 SAYRE (SYO) VORTAC, OK TO TULSA (TUL) VORTAC, OK MEA 4300.

REASON: TEMPORARY NEW TOWER. OE 98-ASW-0123."

b. If the airway NOTAM affects one but less than four ARTCC's and multiple states, issue one NOTAM for each affected ARTCC. If the NOTAM affects four or more ARTCC's, send one NOTAM using FDC as the facility identifier.

c. If the restriction will exceed the time limit established in paragraph 222b, forward an updated FAA Form 8260-16 and/or 8260-2 simultaneously to NFDC for charting.

Examples:

<u>One ARTCC:</u>

"FDC 8/0011 ZBW CT FI/T AIRWAY ZBW. V1 HARTFORD (HFD) VORTAC, CT TO MADISON (MAD) VOR/DME, CT MEA 3000.

REASON: TEMPORARY NEW TOWER. OE 98-ANE-1329."

Two ARTCC's:

"FDC 8/0011 ZBW FI/T AIRWAY ZBW ZNY. V1 HARTFORD (HFD) VORTAC, CT TO DIXIE INT, NJ MEA 3000.

FDC 8/0012 ZNY FI/T AIRWAY ZBW ZNY. V1 HARTFORD (HFD) VORTAC, CT TO DIXIE INT, NJ MEA 3000.

REASON: TEMPORARY NEW TOWER. OE 98-ANE-1329."

Three ARTCC's:

"FDC 8/0011 ZBW FI/T AIRWAY ZBW ZNY ZDC. V1 HARTFORD (HFD) VORTAC, CT TO WATERLOO (ATR) VORTAC, DE MEA 3000.

FDC 8/0012 ZNY FI/T AIRWAY ZBW ZNY ZDC. V1 HARTFORD (HFD) VORTAC, CT TO WATERLOO (ATR) VORTAC, DE MEA 3000.

FDC 8/0013 ZDC FI/T AIRWAY ZBW ZNY ZDC. V1 HARTFORD (HFD) VORTAC, CT TO WATERLOO (ATR) VORTAC, DE MEA 3000.

REASON: TEMPORARY NEW TOWER. OE 98-ANE-1329."

Four or more ARTCC's:

"FDC 8/0001 FDC FI/T AIRWAY ZNY ZDC ZAT ZJX. V1 DIXIE INT, NJ TO CRAIG (CRG) VORTAC, FL MEA 4000.

REASON: TEMPORARY NEW TOWER. OE 98-ANE-1329."

226. NOTAM CONTENT.

a. FDC NOTAM's shall identify the procedure being amended and the current amendment number. The NOTAM shall be as concise as possible, and shall NOT contain information that could be published at a later date by a routine amendment. For example, changes to the touchdown zone or airport elevation, which do not affect visibility minimums, do not require NOTAM action.

b. The text shall be prepared by AVN-100 using plain language and those contractions found in the NTAP. Specialists must keep in mind that the NOTAM is directed to the pilot, and should be worded so that the intended change will not be misinterpreted. Avoid the use of internal cartographic instructions which have no meaning to pilots. Spell out NAVAID names in clear text followed by the identifier. If it appears that the NOTAM length will exceed 20 lines, refer to FAA Order 7930.2, paragraph 4-3-4.

c. For temporary obstructions, include the type, elevation, distance, and direction from the airport or runway threshold, as appropriate, as the last line of the text.

d. If the NOTAM contains permanent information for charting, the last line of the NOTAM text shall identify it as the next sequential alphanumeric amendment; i.e., ORIG A, AMDT 4B, etc. The date of the NOTAM will become the effective date of that amendment.

e. Include a reason for the NOTAM following the NOTAM text. This information will not be transmitted as a part of the NOTAM text, but will inform the NFDC and the USNOF of the basis for the NOTAM. It will also ensure the data is retained in the NOTAM historical files.

Examples:

"FDC 8/_____ ELP FI/P EL PASO INTL ARPT, EL PASO, TX.
ILS RWY 22 AMDT 10...
GS 3.0 DEGREES, TCH 51, GS ALT AT LOM 5155, GS ALT AT MM 4159.
THIS IS ILS RWY 22 AMDT 10A.

REASON: 8240.47 EVALUATION OF RELOCATED GLIDE SLOPE."

"FDC 8/_____ ORD FI/T CHICAGO O'HARE INTL, CHICAGO, IL.
VOR RWY 22R AMDT 8B...
MDA 1400/HAT 750, VIS 1-1/2 ALL CATS.
TEMPORARY CRANE 1100 MSL 1.2 NM SE OF RWY 23. (Specify distances less than 1 NM in feet.)

REASON: TEMPORARY CRANE FOR 90 DAYS. OE 98-AGL-1689."

"FDC 8/_____GPT FI/T GULFPORT-BILOXI REGIONAL, GULFPORT, MS.
VOR RWY 31 AMDT 18...
S-31 MDA 720/HAT 693 ALL CATS. VIS CAT C 2, CAT D 2-1/2. CIRCLING MDA 720/HAA 692 ALL CATS. VIS CAT C 2, CAT D 2-1/2.

RADAR 1 AMDT 3
VOR/DME OR TACAN RWY 31 ORIG...
S-31 MDA 660/HAT 633 ALL CATS. VIS CAT C 1-3/4, CAT D 2, CAT E 2-1/4. CIRCLING CATS A/B MDA 660/HAA 632.

TEMPORARY CRANE 410 MSL 1.5 NM SE OF RWY 31.

REASON: TEMPORARY CRANE FOR 160 DAYS. OE 98-ACE-1453."

"FDC 8/_____ LAN FI/T CAPITAL CITY, LANSING, MI.
ILS RWY 10R AMDT 8A...
ILS RWY 28L AMDT 24...
VOR RWY 6 AMDT 23B...
VOR RWY 24 AMDT 7E...
RADAR-1 AMDT 13...
CIRCLING MDA 1420/HAA 559 ALL CATS.

REASON: NEW BUILDING, 1115 MSL. OE 98-AGL-2974."

> ***NOTE:*** *Since the above condition is permanent, SIAP Amendments must be processed within 224 days. However, in lieu of the above single T-*NOTAM, a *P-NOTAM could be issued for each SIAP.*

"FDC 8/_____ HPT FI/P HAMPTON MUNI, HAMPTON, IA.
VOR/DME RWY 35 ORIGA...
MSA FROM MASON CITY VORTAC 3000.
DELETE: ACTIVATE MIRL RWY 17-35, CTAF.
THIS IS VOR/DME RWY 35 ORIG B.

REASON: NEW TOWER, 2049 MSL, OE 97-ACE-2286. LIGHT NOTE REDUNDANT TO CHARTING.
THIS CANCELS FDC 1/2345."

"FDC 8/_____ AXH FI/P HOUSTON-SOUTHWEST, HOUSTON, TX.
NDB RWY 28 AMDT 4...
CHANGE ALL REFERENCE TO RWY 10-28 TO RWY 9-27.
THIS IS NDB RWY 27 AMDT 4A.

REASON: RUNWAYS RENUMBERED FOR MAGNETIC VARIATION CHANGE."

"FDC 8/_____ AXH FI/P HOUSTON-SOUTHWEST, HOUSTON, TX.
LOC/DME RWY 10 AMDT 2A...
CHANGE ALL REFERENCE TO RWY 10-28 TO RWY 9-27.
THIS IS LOC/DME RWY 9 AMDT 2B.

REASON: RUNWAYS RENUMBERED FOR MAGNETIC VARIATION CHANGE."

227. NOTAM FOLLOW-UP ACTION.

Once a P-NOTAM has been issued, the NFDC will track the procedure change until charted. A copy of all P-NOTAM's shall be stapled to the current 8260-series forms in the procedures file for each SIAP. The NOTAM's will be promulgated to charting agencies in the bi-weekly Transmittal Letter of changes for Federal Register publication. NFDC shall review amended SIAP charts, ensure the procedural change has been charted correctly, and cancel the NOTAM on the amended procedure effective date.

228. NOTAM RESPONSIBILITY.

NOTAM follow-up services, provided by NFDC, are designed to expedite the publication of procedures amended by emergency action and to assist field personnel in the management of NOTAM issuances. Assistance in NOTAM handling by NFDC personnel in no way changes basic responsibilities for determining the need for NOTAM issuance, NOTAM content, or for the required follow-up actions. These responsibilities remain within AVN, and emergency type actions described above are not to be used as a substitute for accurate and timely program planning.

229. RESERVED.

SECTION 10. NAVIGATIONAL FIXES

260. GENERAL.

Criteria for navigational fixes are contained in chapters 2 and 17 of Order 8260.3. When using a VORTAC, fixes should be defined by DME from the facility providing course guidance in addition to radials or course intersections.

261. REPORTING POINTS.

Reporting points are established for use by ATC in the movement and separation of aircraft. Reporting points are divided into two categories, which are:

a. Compulsory reporting points are designated by regulation and, therefore, require rule making action. It is ATC's responsibility to initiate airspace rule making action for the designation of compulsory reporting points. Unless the reporting point can be identified at the lowest operational altitude, it shall not be designated a compulsory reporting point.

b. Non-Compulsory reporting points may be established by ATC without the requirement for rule making action.

262. UNPLANNED HOLDING AT DESIGNATED REPORTING POINTS.

a. Where required for aircraft separation, ATC may request aircraft to hold at any designated reporting point in a standard holding pattern at the MEA or the minimum reception altitude (MRA), whichever altitude is the higher, at locations where a minimum holding altitude has not been requested. For this reason, the conditions to be considered for holding (obstacle clearance, communications, and facility performance) must be reviewed whenever reporting points are established or revised, even though specific holding authorization has not been requested by the ATC facility.

b. Unplanned holding at en route fixes may be expected on airway or route radials, bearings, or courses. If the fix is a facility, unplanned holding could be on any radial or bearing. Where standard holding cannot be accomplished at the MEA or MRA, any necessary limitations must be clearly indicated on FAA Form 8260-2, Radio Fix and Holding Data Record.

263. REQUESTS FOR NAVIGATIONAL FIXES.

FAA Form 8260-2 shall be used as the vehicle to transmit the ATC requests for the establishment, revision, or cancellation of navigational fixes, holding patterns, and/or reporting points. All requests from ATC facilities, civil and military, are forwarded through the appropriate ARTCC to AVN-100. AVN-100 may initiate FAA Form 8260-2 for those navigational fixes which are required for the development of SIAP's. Other operationally required navigational fixes shall be coordinated with the appropriate ATC facility.

264. NAMING NAVIGATIONAL FIXES. In order to satisfy the requirements of Flight Management System (FMS), the following applies for all procedures:

a. Name all intersections, DME fixes, ATD fixes (except final segment stepdown fixes), RNAV waypoints, starting and ending points of arc initials or feeder segments, and (except for dead-reckoning initials) points where feeder or initial routes intercept the final approach course extended prior to the initial or intermediate fix. Each name consists of a 5-letter pronounceable word. Obtain 5-letter names from NFDC. Name fixes collocated with a facility (named in accordance with Order 7400.2, chapter 3) the same as the facility.

b. Coordinate with NFDC and the appropriate ARTCC when a fix name change is required. Document the change on FAA Form 8260-2.

265. DOCUMENTING NAVIGATIONAL FIXES.

a. All named civil and military fixes shall be documented and approved on FAA Form 8260-2. Chapter 9 of this order contains instructions for entering data and submitting FAA Form 8260-2.

b. Military fixes are also maintained in the National Data Base and are used to support the air traffic system. Therefore, the requirement to document and flight inspect military fixes must receive the same priority as the fixes that support civil procedures.

266. CORRELATION OF NAVIGATIONAL FIXES AND CHANGEOVER POINTS (COPS).

The designation of navigational fixes should be directly related to COP's. Care should be taken to avoid designating navigational fixes which require the use of a facility beyond the COP. Figure 2-6 is an example of the proper and the improper method of designating a navigational fix in relation to COP's.

NOTE. These diagrams illustrate a problem encountered when handling intersections and changeovers. Make certain the entire complex is reviewed to prevent establishing procedures which are in conflict with the usability of the facilities involved.

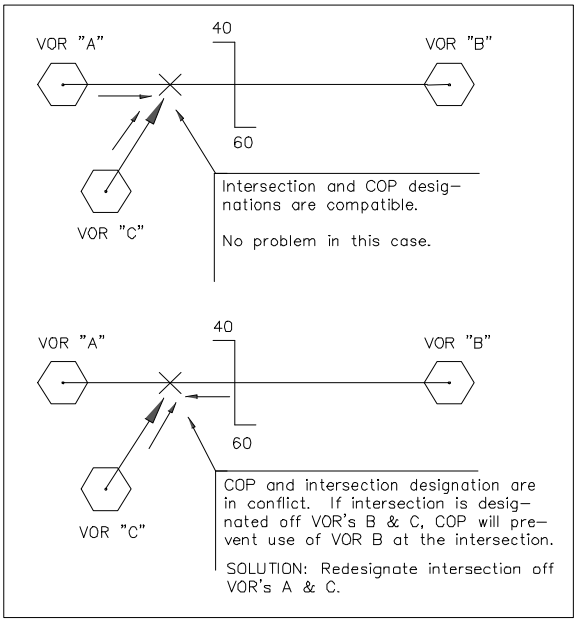

Figure 2-6. PROPER AND IMPROPER METHOD OF DESIGNATING A NAVIGATIONAL FIX

267. MINIMUM RECEPTION ALTITUDES (MRA).

At certain navigational fixes, VOR reception from an off-course facility may not be adequate at the lowest MEA associated with the route segment. In such cases when the MRA at the fix is higher than the MEA for instrument flight, the MRA shall be established for the fix and indicated on Forms 8260-2 and 8260-16. Once established, an MRA will not be revised unless the reception altitude is changed by 200 feet or more (see paragraph 905d(2)(e)).

268. FLIGHT INSPECTION.

After completion of required coordination, flight inspection personnel shall confirm facility performance at the proposed operational altitudes. Where possible, determinations shall be predicated on current facility performance records; otherwise, a flight check shall be accomplished.

269. MAXIMUM AUTHORIZED ALTITUDES (MAA).

MAA's are procedural limits which might be determined by technical limitations or such other factors as limited airspace or compatibility with other procedures. Where MAA's are required in connection with the publication of flight procedures, they are in-cluded on Forms 8260-2 and 8260-16, or worksheets used to process the data. See also paragraph 905d(2)(e).

(a) Highest **DA/MDA**;

(b) Most adverse **MAP relocation**;

(c) Highest **climb gradient** for ILS Category II or III (or any other procedure with waiver).

(5) For missed approach level surface, that obstacle in the primary (or secondary equivalent) which has the highest elevation.

(6) For DP's, that obstacle which, having penetrated the 40:1 Obstacle Identification Surface (OIS), causes the most adverse climb gradient and/or ceiling and visibility to be published.

273-279. RESERVED.

SECTION 12. WAIVER OF STANDARDS

280. GENERAL.

Submit a request for a waiver of flight procedures standards on an approved computer generated FAA Form 8260-1, Flight Procedures Standards Waiver (see paragraph 903). Each waiver request will be considered ONLY when there is no other suitable way to resolve a procedural problem, or to provide a required service. The waiver is used to officially document the nonstandard application of criteria, and serves as a means to identify criteria that may require further refinement or to identify problem areas.

281. WAIVER PROCESSING.

Request waivers by completing the front of Form 8260-1. Detailed instructions for completing the form are contained in chapter 9, section 3. Figure 9-1 provides an easy reference for waiver form processing and routing requirements.

a. Forward the original FAA Form 8260-1 and supporting data for approval to AFS-400 through AFS-420. For U.S. Army procedures, forward waiver requests for approval to the U.S. Army Aeronautical Services Agency (USAASA) or U.S. Army Aeronautical Services Detachment, Europe. Use the specially adapted automated version of the Form 8260-1 for U.S. Army waiver processing.

b. Complete documentation and supporting data must accompany the waiver request so reviewing offices can conduct an evaluation without additional research. Submit appropriate 8260-series forms with each request. Include large scale charts depicting the procedure and/or obstacles which are the subject of the waiver.

c. Enter only one waiver request on the waiver form.

d. When a procedure is amended, reprocessing of an existing waiver is not necessary unless the reason for the amendment directly impacts the basis for the waiver.

e. When a waiver is proposed for obstacle penetration of ILS final or straight missed approach surfaces, request a Collision Risk Model (CRM) study through AFS-420. Refer to Order VN 8260.4, ILS Obstacle Risk Analysis. At the time of the request, provide all data required for conducting the study. AFS-420 then analyzes and interprets the result of the CRM and provides the results to AVN-100.

f. The Flight Procedure Standards Branch, AFS-420, reviews all waiver requests, and develops and forwards the proposed Flight Standards endorsement to AFS-400 for final action. When necessary, Flight Standards will annotate the Form 8260-1 that approval is contingent upon a successful flight inspection report.

g. AVN is responsible for ensuring that an approved waiver of standards is on file for each instrument procedure requiring waiver action. AFS waiver approval shall be obtained before submitting the procedure to NFDC for publication.

282. WAIVERS FOR SPECIAL INSTRUMENT APPROACH PROCEDURES.

Except for proponent developed procedures, when a waiver is approved for a special instrument approach procedure, AVN shall coordinate with the appropriate FSDO concerning any special conditions that may be imposed on the use of a special authorization. This action is necessary to establish required supervision to ensure user compliance with equivalent level of safety provisions. For example, special aircrew training may be required as an equivalent level of safety.

283. PERIODIC REVIEW OF WAIVERS.

AVN shall review approved waivers biennially to determine whether the waivers are still required. Cancel unnecessary waivers.

284. CANCELLATION OF WAIVERS.

a. Cancellation of waivers shall include a reason in the comments block. Such termination may be directed by AFS-400. AVN is responsible

SUBSTITUTE ROUTE STRUCTURE

Snowflake, CO, VORTAC shutdown, scheduled or unscheduled. For substitute routes, MEA's, and Reporting Points, use the following:

LOW ALTITUDE

	Existing Airways	**Substitute Routes**	**MEA/MAA**
V220	SKI VORTAC to SNO VORTAC	SKI VORTAC to Temp SNO Int via SKI R-340	10000/17500
V220	SNO VORTAC to MTN VORTAC	Temp SNO Int to MTN VORTAC via MTN R-152	11000/17500
Direct	SNO VORTAC to ASPEN Int	None	
Off-Airway	SNO VORTAC to VAL VOR	Temp SNO Int to VAL VOR via SBT R-259 to SBT, SBT R-040 & VAL R-220	15000/37000
	Existing Reporting Point	**Temporary Reporting Point**	**MRA**
	SNO VORTAC	Temp SNO Int: SKI R-340/82 & SBT R-259/65	10000
	RUTHY	SKI R-340/43	8500
	SARDY	Temp SARDY Int: MTN R-152/60 & SBT R-270	11000
	SILVR	None	

HIGH ALTITUDE

	Existing Routes	**Substitute Routes**	**MEA/MAA**
J233	BRR VORTAC to SNO VORTAC	BRR VORTAC to Temp SNO DME via BRR R-314	20000/45000
J233	SNO VORTAC to FUN VORTAC	Temp SNO DME to FUN VORTAC via FUN R-148	20000/45000
	Existing Reporting Point	**Temporary Reporting Point**	**MRA**
	SNO VORTAC	Temp SNO DME: BRR R-314/159 & FUN R-148/133	20000
	HILAN	BRR R-314/82	18000

Approved: _____, Date _____
(Name), Manager
National Flight Procedures Office, AVN-100

Figure 3-4. SUBSTITUTE ROUTE STRUCTURE

336. PROCESSING.

a. Lead Time. Process data concerning substitute routes sufficiently in advance of the effective date of the facility shutdown to assure publication when charting is required. To provide necessary lead time, the substitute routes must be forwarded to NFDC nine weeks prior to the chart's effective date. If the lead time cannot be provided, delay the shutdown or consider printing a special graphic NOTAM. Normally, shut-down of facilities scheduled for 28 days (half the life of the en route chart) or less will not be charted; however, traffic considerations at major terminals may make charting necessary for the short term shut-downs.

b. Submissions.

(1) ARTCC submitted substitute routes (see figure 4) require the signature of the AVN-100 Manager, or a delegated representative. This signature thereby indicates operational approval of these sub-routes for unscheduled use. This approval shall be submitted directly to the ARTCC concerned (see paragraph 338)b.

(2) When AVN-100 determines that publication is required for a scheduled or extended unscheduled outage, AVN-100 forwards the ARTCC submitted substitute routes to NFDC for publication (see paragraph 338a).

337. PERIODIC REVIEW.

a. The ARTCC should review substitute en route flight procedures at least once every 4 years and at any time changes occur in the airway structure. The ARTCC shall submit any required modifications to AVN-100 for certification and approval.

b. AVN-100:

(1) Notify the responsible ARTCC and withdraw approval when:

(a) Frequency protection can no longer be provided to support the sub-route procedure.

(b) Flight inspection data is not available to support continued certification and approval of the sub-route procedure.

(2) Review existing and proposed sub-routes for required obstacle clearance at least once every 4 years.

(3) Notify the ARTCC of any amendments necessary.

338. DISTRIBUTION.

a. For Publication. List the shutdown dates in the cover letter.

FSD	1 copy
ATA-110	2 copies
ARTCC	1 copy
AVN-100	Original

b. Non-Publication.

FSD	1 copy
ARTCC	1 copy
AVN-100	Original

339. RESERVED.

CHAPTER 4. TERMINAL PROCEDURES

SECTION 1. GENERAL

400. GENERAL.

The FAA has the responsibility to establish instrument procedures used for terminal operations at civil airports within the United States and its possessions. The FAA also provides or approves instrument procedures used by U. S. flag carriers at foreign airports.

401. CATEGORIES OF INSTRUMENT APPROACH PROCEDURES.

Procedures published in the Federal Register under 14 CFR Part 97 are identified as "Standard Instrument Approach Procedures" (SIAP's). These procedures are available to all users. Instrument flight procedures authorized for use only by air carriers or some other segment of the aviation industry are not published in the Federal Register and are identified as "Special Procedures." Special Procedures may be developed for public and private use based on aircraft performance, aircraft equipment, or crew training, and may also require the use of landing aids, communications, or weather services not available for public use (see paragraph 833).

402. AIRSPACE REQUIREMENTS.

a. Public use procedures and Special procedures at Part 139 airports shall be contained within con-trolled airspace in accordance with Order 7400.2, Procedures for Handling Airspace Matters.

b. Where an airport does not qualify for a Class B/C/D/E surface area, designate Class E 700′ airspace. In the latter case, landing minimums may be established below the floor of controlled airspace. A requirement for minor adjustment to existing controlled airspace, to fully encompass an instrument procedure, will not form the basis for withholding procedure publication. An approach procedure may be published prior to obtaining the optimum configuration of controlled airspace when the following conditions exist (see Order 8260.26, Establishing and Scheduling Standard Instrument Procedure Effective Dates, paragraph 6d(1)):

(1) The centerline of all terminal routes is located inside of existing controlled airspace.

(2) The procedure turn area out to the appropriate distance specified in chapter 5 is contained within existing controlled airspace.

(3) The final approach fix is contained within existing controlled airspace.

c. Special procedures other than those noted in paragraph 402a, should, where possible, be contained within controlled airspace in accordance with Order 7400.2. Special procedures may be established and approved outside of controlled airspace where it is not possible to designate controlled airspace. In such cases, annotate the procedure: "Procedure not contained within controlled airspace," and advise the appropriate FSDO that controlled airspace will not be provided. Do NOT use special procedures as a temporary measure pending designation of controlled airspace for public use procedures.

403. CONTRACTUAL USE OF PRIVATE FACILITIES.

An air operator may arrange for the use of a privately owned navigational aid (NAVAID). Such an arrangement requires a contractual agreement between the sponsor and the user regarding facility use. AFS shall coordinate all requests for contractual use of private navigation aids with the sponsor. Approval of the special instrument procedure for an operator is contingent upon the RFSD receiving a copy of an acceptable contractual agreement. Refer to paragraph 703 for procedures for the first time approval of a non-Federal NAVAID.

404. TERPS APPLICATION.

Develop all instrument approach procedures, except foreign procedures developed in accordance with Order 8260.31, Foreign Terminal Instrument Procedures, under the provisions of TERPS, and the guidelines in this document. The following special provisions and guidelines apply to selected paragraphs of TERPS criteria. The paragraph numbers refer to identically numbered paragraphs in TERPS.

a. Paragraph 5a(2), Simultaneous Procedures. Where simultaneous operations are

authorized to parallel runways, or conflicting runways having similar operational problems as parallel runways, note the authorization on each individual ILS procedure. Identify the procedure in accordance with TERPS paragraph 161.

b. Paragraph 122a, Airport. The runway lighting requirement does not apply to night instrument takeoff procedures.

c. Paragraph 122c, Obstacle Marking and Lighting. Do NOT deny instrument approach procedures due to inability to mark and light or remove obstacles which violate 14 CFR Part 77 surfaces Exception: See TERPS paragraph 251b(2)(c). Objects which penetrate these surfaces are normally studied by AVN-100 prior to construction or alteration. AVN-100 recommendations for marking, lighting, or removal are made at that time.

d. Paragraph 151, Coordination Conflicts. AVN-100 shall make every effort to resolve coordination conflicts, and shall thoroughly evaluate objections received as a result of coordination or by direct inquiry. This evaluation should determine the validity of the comments and the course of action to be taken:

(1) Acknowledge the comments and amend or withdraw the procedure; or

(2) Determine that the procedure is correct as submitted. All adverse comments received, through formal coordination, shall be answered in writing. Conflicts which cannot be resolved by the region shall be forwarded to the Flight Procedure Standards Branch, AFS-420, with an information copy to the commenting agency.

e. Paragraph 160, **Identification of Procedures.** Military operators have stated a requirement for TACAN instrument approach capability to a limited number of airports. These airports have a prescribed VOR procedure, based on a VORTAC facility, where TACAN-equipped aircraft are expected to operate. VOR procedures at these locations may be executed by TACAN-equipped aircraft when the procedure is identified as **"VOR or TACAN."** This informs both the pilot and the controller that an approach may be executed with aircraft equipped with only VOR or with only TACAN. Approval of the use of individual VOR procedures by TACAN-equipped aircraft is subject to review for compliance with TERPS and flight check criteria. Take the following actions to implement this program:

(1) Designate VOR/DME procedures, predicated upon the use of VORTAC, as **"VOR/DME or TACAN"** provided flight inspection has determined that the TACAN and VOR components will support the procedure. These procedures require DME. Establish the missed approach clearance limit at a radial/DME fix in lieu of the VORTAC facility to accommodate aircraft equipped with only TACAN. FAF procedures identified ".../DME" are not authorized.

(2) Establish a VOR type procedure when a VOR procedure (no TACAN requirements) is required to accommodate non-DME equipped aircraft, and is predicated upon a VORTAC facility. However, establish combination VHF/DME fixes, where possible, for optional use by DME-equipped aircraft.

(3) Make provision for TACAN-only equipped aircraft to use VOR approach procedures when requested by the appropriate military authority, and procedure design and facility performance will permit. Where approval can be authorized, rename VOR procedures based on VORTAC facilities in accordance with the following examples: **"VOR or TACAN RWY 30, or VOR or TACAN-A."** Before this identification is used, flight inspection must determine that the TACAN azimuth alignment is satisfactory. Review and modify the procedure as necessary to fully support its use by TACAN-equipped aircraft:

(a) Establish the missed approach clearance limit at a combination VHF/DME fix for TACAN aircraft.

(b) Add DME fix capability to VHF intersections where required for TACAN use.

(c) Ensure that the procedure can be flown satisfactorily by reference to TACAN-only equipment.

(d) Ensure that the procedure can be flown satisfactorily by reference to VOR-only equipment.

(e) Ensure that holding is not authorized for TACAN-equipped aircraft at the

VORTAC. This also applies to VOR/DME or TACAN procedures.

f. Paragraph 161, Straight-in Procedure Identification. When approaches meet straight-in criteria for multiple runways, name the procedures accordingly.

Examples: **VOR RWY 14L/R**
NDB RWY 26L/C
VOR RWY 5/7

g. Paragraph 162, Circling Procedures.

(1) Do not duplicate the alphabetical suffix for circling procedures at an individual airport to identify more than one circling procedure. If more than one circling procedure exists, and regardless of the final approach alignment or type of facility, use successive suffixes.

Example: **NDB-A, VOR-B, LDA-C.**

(2) The alphabetical suffix for circling procedures shall not be duplicated at airports with identical city names within one state. Regardless of the airport name, successive suffixes shall be used for all airports which serve the same city.

Examples:

State	City	Airport	Procedure
Georgia	**Atlanta**	**Municipal**	**VOR-A**
Georgia	**Atlanta**	**DeKalb**	**NDB-B**
Georgia	**Atlanta**	**Fulton**	**VOR-C**

h. Paragraph 172, Effective Dates. See Order 8260.26. FAA policy does not permit the issuance of complete civil instrument approach procedures by NOTAM (see paragraphs 837 and 838).

i. Paragraph 221b, Emergency Safe Altitudes. This paragraph does not apply to civil procedures.

j. Paragraph 241, Altitude Selection. The FAF altitude shall not be less than the highest straight-in or circling MDA, including adjustments.

k. Paragraph 250, Final Approach Segment. For nonprecision approaches, the final approach segment area considered for obstacle clearance begins at the FAF and ends at the runway or missed approach point, whichever is encountered last. This concept applies to TERPS paragraphs 513, 523, 713, 953, and 1044. For precision approaches, the area considered for obstacle clearance begins at the precision final approach fix (PFAF) (i.e., glide slope intercept point) and ends at a point 200 feet outward from the threshold (see TERPS paragraph 930).

l. RESERVED.

m. Paragraph 261, Circling Approach Area Not Considered for Obstacle Clearance. Sectorize the circling area only to deny circling within a prescribed area.

n. Paragraph 270, Missed Approach Segment. The missed approach altitude shall not be less than the highest MDA, including adjustments.

o. Paragraph 283. Fixes formed by Radar. Coordinate with the appropriate air traffic facility before establishing a radar fix to assure the facility agrees to provide radar fix service when requested or required. When an air traffic facility advises that they can no longer provide radar fix service, revise procedures to remove the radar fix.

p. Paragraphs 275, 277b, 943, 945b, 1033, 1035b, Turning Missed Approach/Turning Area.

(1) The missed approach segment must be constructed with consideration given to all categories of aircraft. Plotting only the highest or heaviest authorized aircraft category area will not assure proper area evaluation for lower categories. Construct turning areas for the lowest and highest aircraft categories for turns at the MAP; or for turns at the end of the straight portion of the combination straight and turning missed approach. Where obstacle penetrations exist, evaluate the appropriate area for each category to determine specific aircraft category impact.

(2) Section 2 boundary terminates at Point B (or Point C for ILS or PAR) **only** if a fix exists at the end of section 1 **and** if course guidance is provided in section 2.

q. Paragraph 287c, Final Approach Fix (FAF). If the buffer or 40:1 surface evaluation identifies an obstacle penetration, you may clear the problem by increasing the minimum descent altitude (MDA) by the amount of obstacle penetration. When

applying the buffer to a straight missed approach segment with positive course guidance, the area between the missed approach point (MAP) and the 40:1 rise starting point is considered missed approach primary area. The 12:1 surface begins where the 40:1 rise starts.

r. RESERVED.

s. Paragraph 311. When Category E minimums are required on civil procedures, use TERPS table 10 to establish visibility minimums. Category E minimums shall not be less than that required by table 9.

t. Paragraph 323b, Remote Altimeter Setting Source. Whether the use of a remote altimeter setting is primary or full-time, or secondary to a local source, establish the required visibility as stated in paragraph 404u.

u. Paragraph 330, Establishment of Visibility Minimums. For nonprecision approaches, use TERPS paragraphs 330c(1) and (2) and 251 to determine the minimum no-lights visibility. For precision approaches, TERPS paragraphs 251, 330c(1), and 350 apply.

(1) Circling minimums shall not be less than no-lights straight-in minimums.

(2) Visibility based on the distance direct from MAP to threshold shall be rounded to the next higher reportable value.

(a) When the visibility without light credit is less than 3 statute miles (sm), round the no-light visibility to the next higher quarter mile; e.g., 1.75 remains 1.75 sm, but 1.76 becomes 2 sm.

(b) When the visibility without light credit is greater than 3 statute miles, round the no-light visibility to the next higher whole mile increment; e.g., 4.00 remains 4 sm, but 4.01 becomes 5 sm.

v. Paragraph 333, Runway Visual Range (RVR). RVR shall be authorized on adjacent runways when segments of those runways are located within a 2,000′ radius of the transmissometer location and the requirements of TERPS paragraph 334 are met.

(1) RVR shall be authorized in accordance with the following. See Order 6560.10, Runway Visual Range (RVR):

(a) Category II/III Rollout RVR. Threshold plus 2,000′ of runway required within the 2,000′ circle.

(b) Category I ILS and nonprecision touchdown RVR. Threshold plus 1,200′ of runway required within the 2,000′ circle.

(c) Mid-field RVR. 2,000′ coverage of runway centerline including the runway midpoint required within the 2,000′ circle.

(2) When a transmissometer serves more than one runway and a Category II/III runway is involved, the touchdown RVR will be sited with respect to the Category II/III runway. RVR installations meeting requirements for use on adjacent runways may be utilized for reducing standard takeoff visibility.

(3) AVN-100 shall determine, in conjunction with Airway Facilities (AF), the following:

(a) Planned RVR installations, proposed commissioning dates, and runways to be served.

(b) Runways that meet the requirements for authorizing RVR.

(c) RVR installations that are to be used to report RVR for adjacent runways and the effective date of the procedures.

(4) AVN-100 shall revise affected procedures by the normal amendment process or P-NOTAM process.

w. Paragraph 334, Runway Requirement for Approval of RVR. If runway markings are removed or obliterated subsequent to the commissioning of the RVR, the RVR minimums may require adjustment. However, before an adjustment is made to the minimums, AVN-100 should advise the airport sponsor of the proposed course of action. Where corrective action cannot be accomplished within a reasonable length of time, AVN-100 shall submit a revised procedure reflecting the adjustment to landing minimums.

x. Paragraph 343, Visibility Reduction. The runway alignment indicator light (RAIL) portion of a MALSR or SSALR must be operating in order to retain visibility reductions authorized in TERPS table 9. Unattended approach light systems that have a radio control device for a pilot to exercise control over the system, qualify for the same minimums as light systems that are controlled from a ground position.

y. Paragraph 360, Standard Alternate Minimums. Do not authorize alternate minimums when the facility providing final approach guidance is a Category III monitored facility (not monitored by ATC). If a procedure has a stepdown fix predicated on a Category III monitored facility, establish alternate minimums no lower than the minimum altitude without the fix. See TERPS paragraphs 213c(1) and (2). Standard alternate minimums provide a margin of safety over basic straight-in landing minimums. Where higher than basic landings minimums are required, consider an equivalent increase for the alternate minimums, particularly at remote airport locations. Similar consideration should be given when establishing alternate minimums at airports served by a single instrument approach which authorizes circling minimums only.

z. Paragraphs 413a(2), 513a(2)(b), 613a(2), and 713a(2)(b). Circling approach alignment criteria, using on-airport facilities, permits the use of all radials (360 degrees). It is not a requirement for the final approach course to pass through a portion of the landing surface.

aa. Paragraph 957, Missed Approach Segment. The missed approach area dimensions for the localizer differ from those of the full ILS, unless the MAP's are collocated. Evaluate both missed approach areas for obstacle clearance requirements. Provide a single missed approach procedure to serve both ILS and localizer approaches. An LDA, localizer-only, localizer back course, or SDF missed approach point shall be at least 3,000′ prior to the localizer facility. For precision approaches, or where a glide slope is used, the DH/MAP shall be no closer to the localizer antenna than a point where the localizer is 400′ wide. See Order 8200.1, paragraph 217.3206a.

bb. Paragraph 1201, Application.

(1) Apply diverse departure criteria to all runways at airports where public or special IAP's exist, and the FAA is the approving authority. If restrictions are not imposed, expect aircraft departures in all directions from all runways.

(2) If restrictions (40:1 surface penetrations) are identified for a specific runway in the diverse review, apply TERPS paragraph 1202 or 1203.

cc. Paragraph 1202. Defer that part of this paragraph pertaining to sectoring departures until further notice.

dd. Paragraphs 1202a(2), 1203a(2), 1203b(2)(a), and 1203c(2)(a). Originate the obstacle identification surface (OIS) at the elevation of the departure end of runway (DER). It may begin no higher than 35′ above the DER when required by existing obstacles. In the latter case, annotate the procedure with the minimum DER crossing height requirement; e.g., "CROSS DER AT OR ABOVE xx' AGL/xxx' MSL." Do not increase the origination height to accommodate new or proposed obstructions.

ee. Paragraphs 1202b(1) and 1202c(1). The "minimum altitude authorized for en route operations" is that altitude which allows en route obstacle clearance in conjunction with random (diverse) departures. Evaluate the 40:1 surface to an altitude equal to the highest obstacle elevation plus appropriate required obstacle clearance (ROC). Evaluate obstacles as follows:

(1) Construct Zones 2 and 3 OIS radial extensions from a point on the runway centerline 2,000′ from the start end of the runway out for a distance of 110 NM for CONUS and 140 NM for Alaska; construct the hemispherical boundaries accordingly. (The 110 NM approximates the distance for a 40:1 surface to reach 16,500′ - 14,500′ for the highest CONUS terrain plus 2,000′ ROC worst case. In Alaska, Mt. McKinley, 20,320′ plus ROC was used.)

(2) Determine the highest terrain/ obstacle within this area; add appropriate ROC (Special ROC, etc.).

(3) Divide the results by 152′/NM. (This determines the actual radius for the obstacle search.

Anything beyond this radius will be cleared by the 40:1 surface).

(4) Evaluate the area out to this radius for 40:1 penetrations. Measure the distance to the obstacles as in chapter 12. (Suggest searching the area out to a 10 NM radius first as most controlling obstacles are found in this area.)

(5) If there are no penetrations, diverse departures are authorized. Aircraft can be expected to safely depart in random directions from the airport to the altitude determined in paragraph 404ee(2).

(6) If there are penetrations, diverse departures are NOT allowed. Evaluate specific departure routes to avoid obstacles. TERPS paragraph 1203 applies.

ff. Paragraph 1205a. Defer application of this paragraph until further notice.

gg. Paragraph 1205d. Since application of paragraph 1205e is deferred, a note shall be necessary (see paragraph 835d(2)(a)).

hh. Paragraph 1205e. Defer application of runway reduction until further study of practicality and method of implementation of this procedure has been completed.

ii. Paragraph 1205f. Delay expressing climb gradient in feet per minute pending an improved method of presentation, which is being developed.

jj. Paragraph 1207a. Defer application of this paragraph until further notice.

kk. Paragraph 1208. Defer application of this paragraph to obstacles greater than 3 SM from DER.

ll. Paragraph 1501r. Interpolate tables 15-1 and 15-2 or use the next higher values.

mm. Paragraph 1502g. Establish only one stepdown fix in a LORAN SIAP final segment.

nn. Paragraph 1512a. The 120° turn limitation does NOT apply for a feeder-to-initial segment connection where the initial segment is a course reversal.

405. SIDESTEP MANEUVERS. A sidestep maneuver is the visual alignment maneuver, required by a pilot executing an approach to one runway and cleared to land on a parallel runway. The following conditions shall exist:

a. Runway centerlines are separated by 1,200′ or less.

b. Only one final approach course is published.

c. Course guidance is provided on the runway centerline or within 3° of the runway centerline of the primary runway.

d. The procedure is identified in accordance with TERPS paragraph 161.

e. Final approach areas shall be established for both runways and shall be determined by the approach guidance provided. Both final approach areas shall be used to determine the MDA to the sidestep runway.

f. Use the same nonprecision obstacle clearance used for the primary runway to determine the published MDA for the sidestep maneuver.

g. Establish published visibility in accordance with table 6 or 11 of TERPS, whichever is higher.

(1) One-half mile visibility reduction is authorized if ALS, MALSR, or SSALR is installed to the sidestep runway. The minimum visibility after applying credit for lights must be no less than 1 mile.

(2) Visibility shall be increased 1/4 mile when the "sidestep" runway threshold is over 1,000′ closer to the FAF than the runway with course guidance.

NOTE: If descent gradient is exceeded, the sidestep maneuver shall NOT be authorized.

h. Sidestep minimums shall be published in accordance with the example below:

Minimums block*:*

S-ILS 27L
S-LOC 27L
SIDESTEP 27R
CIRCLING

406-419. RESERVED.

SECTION 2. STANDARD INSTRUMENT APPROACH PROCEDURES (SIAP)

420. GENERAL.

SIAP's shall be established in accordance with TERPS, other specific FAA 8260-series orders, and the policies set forth in this order. FAA policy and instructions for completing FAA 8260-series forms are contained in chapters 8 and 9.

421. COORDINATION OF TERMINAL INSTRUMENT PROCEDURES.

Coordination requirements for terminal instrument procedures are set forth in TERPS, chapter 1, section 5. See paragraph 908 for a sample formatted letter that can be used for coordination, and instructions for processing. AVN-100 shall initiate the letters. Evaluation and disposition of user comments are the responsibility of AVN-100. Valid user objections that cannot be accommodated by AVN-100 should be referred to AFS-420 for resolution prior to submission of the procedure for publication (see paragraph 837d).

422. RADAR INSTRUMENT APPROACH PROCEDURES.

ATC personnel determine which runways require radar instrument approach procedures and coordinate these requirements through AVN-100.

423-429. RESERVED.

SECTION 3. VISUAL DESCENT POINT (VDP)

430. ESTABLISHMENT. The VDP defines a point on a straight-in, nonprecision approach, including RNAV, where a normal descent from the MDA would commence if the required visual references were acquired.

a. Establish a VDP provided the SIAP meets the requirements of TERPS paragraphs 251, 252, and 253.

b. For chart clarity, a VDP should be no less than (1 mile OPTIMUM) (0.5 miles MINIMUM) from a final segment fix or MAP. If proximity closer than 0.5 miles is required, consider one of the following actions:

(1) Do NOT establish a VDP.

(2) Relocate the fix to the VDP location, and do NOT establish a VDP.

(3) Relocate the fix to accommodate the 0.5 mile (or greater) requirement.

NOTE: Option (2) above increases MDA and descent angle. Option (3) increases S/D altitude.

c. Do NOT adjust visibility minimums to accommodate a VDP.

d. Where used, the DME source shall be the same as the DME source for DME fixes in the final segment.

431. FAA FORM 8260-9 ENTRIES. To facilitate review, entries may be required in the REMARKS section. Where a VDP is not established, give the reason; e.g., obstacles penetrate VDP surface, descent gradient, proximity to final approach segment (FAS) fix, etc. (see paragraph 909c).

432-439. RESERVED.

SECTION 4. SPECIAL PROCEDURE PROCESSING INSTRUCTIONS

440-449. RESERVED

SECTION 5. DIRECTION FINDING (DF) PROCEDURES

450. GENERAL.

DF facilities have been established at air traffic facilities. Many of these have the capability to provide emergency approach procedure support where the DF antenna is suitably located with respect to an airport. This section describes a modified procedure to provide maximum stability in the approach by utilizing small degrees of turns and descents.

451. FORMAT.

The DF approach procedure shall be documented and approved on Form 8260-10, Standard Instrument Approach Procedure, and restrictively identified for emergency use only. Include a diagram showing the plan view of the procedure, including magnetic courses and minimum flight altitudes. Provide minimum safe altitude to 100 miles from the DF antenna. Name the appropriate ATC facility on Form 8260-10 to identify the source of DF control.

452. APPLICATION OF CRITERIA.

Formulate the basic DF approach procedure in accordance with TERPS chapter 8 (see also paragraph 216c(4). Modify the approach pattern in accordance with the following guidelines:

a. Initial Approach Segment. The initial approach for on-airport facilities includes all portions of the approach between the station passage and the final approach course. Approach procedures for DF facilities located off the airport shall have an intermediate segment, in accordance with TERPS paragraphs 812 and 813. The following is a description of the modified low altitude triangular pattern:

(1) A 30° angle of divergence exists between the outbound course and the reciprocal of the inbound course.

(2) The outbound leg is established as a 3-minute leg.

(3) The base leg is formed by a 120° turn to position the aircraft 90° to the final approach course.

(4) Two 45° turns are provided to place the aircraft on final approach. These turns are depicted on the diagram and executed at the discretion of the DF operator.

b. Minimum Altitudes. Show minimum altitudes for each approach segment except for the portion between the 45° turns. Establish the minimum altitude for the final approach segment in accordance with TERPS paragraph 321. Since these are emergency procedures, do NOT establish ceiling and visibility minimums.

c. Identification of Procedures. Normally, develop only one approach procedure for each DF location. More than one procedure may be developed when procedures for low and high performance aircraft are not compatible. Identify procedures in accordance with TERPS paragraph 161.

453. DF VECTORING ALTITUDES.

Where a DF approach procedure is not authorized, DF vectoring altitudes may be developed for use by the controlling facility. Altitudes shall be entered on Form 8260-10 and shall be identified as DF vectoring altitudes. Required obstacle clearance is 1,000′. Round altitudes to the next higher 100′ increment. Minimum accuracy standards for controlling obstacles are stated in paragraph 271b.

454. DF VECTOR AREA.

a. Criteria. Construct the DF Vector area in accordance with paragraph 451, and TERPS Chapter 8.

b. Sector Radii.

(1) Outer sector radius is 100 NM.

(2) Middle sector radius is 40 NM (Doppler) or 30 NM (VHF/DF).

(3) Other distances may be used to sectorize around obstructions and otherwise, if operationally justified.

(4) Use a 20 NM sector radius for a low altitude SIAP, and the 30/40 NM radius for high altitude penetrations.

(5) Radii less than 10 NM should be used with caution due to the requirement for adjacent sector obstacle coverage stated in TERPS paragraph 810.

c. Sector reduction. Use a minimum number of sectors by combining sectors where possible.

NOTE: Remember that DF is for emergency use; and ATC is attempting to get the aircraft into radar coverage or a clear area where the aircraft can let down VFR.

d. Minimum safe or sector altitudes may be increased and combined with adjacent higher sectors when a height difference does not exceed 500′- UNLESS an operational requirement exists for lower altitudes (e.g., initial approach altitude for DF SIAP).

455. DISTRIBUTION.

AVN-100 shall prepare and approve the Form 8260 10, assign the effective date, and distribute as follows:

FPO	1 copy
FSS/Tower providing DF Service	1 copy
ARTCC	1 copy
ATA-110	1 copy
AVN-100	Retain Original

456. CANCELLATION OF DF PROCEDURES.

When the DF procedure or DF Vectoring area is no longer required, AVN-100 shall take action to cancel the procedure. Continued need shall be determined during the biennial review.

457-459. RESERVED.

SECTION 6. CATEGORY II AND III ILS

460. GENERAL.

a. Guidance. The following directives contain criteria to be used in the development or amendment of ILS Category II and III procedures:

(1) Order 8260.3B, chapter 9; or **Order 8260.36A**, Civil Utilization of Microwave Landing System (MLS).

(2) AC 120-29, Criteria for Approving Category I and II Landing Minima for FAR 121 Operators, appendix 2.

(3) AC 120-28C, Criteria for Approval of Category III Landing Weather Minima, paragraph 8.

(4) Order 8200.1, United States Standard Flight Inspection Manual, section 217.

(5) Order 8240.45, Flight Inspection of Type II ILS Facilities Used for Category III Operations.

(6) Order 6750.24, Instrument Landing System (ILS) and Ancillary Electronic Component Configuration and Performance Requirements.

(7) Order 8400.8, Procedures for Approval of Facilities for FAR Part 121 and Part 135 CAT III Operations.

b. Advise the general public of airports authorized Category I, II, and III minimums by publishing the appropriate 14 CFR Part 97 SIAP. Category IIIc minimums shall be included in the minimums format of the IAP (see paragraph 813k).

c. The minimum class of performance (see Order 6750.24) required for an ILS to support a published ILS Category II or III SIAP is as follows:

(1) Class II/T/2 for Category II operations.

(2) Class III/D/3 for Category III operations not less than RVR 700**.**

(3) Class III/E/3 for Category III operations not less than RVR 600.

(4) Class III/E/4 for Category III operations less than RVR 600.

d. A detailed explanation of the characters used to identify a facility's class of performance is contained in Order 6750.24, appendix 2. The first character (I, II, or III), ILS International Civil Aviation Organization (ICAO) standards, is determined jointly by flight inspection and engineering personnel. The second character (A, B, T, D, or E), localizer course structure, is determined solely by flight inspection personnel. The third character (1, 2, 3, or 4), ILS integrity and continuity, is determined solely by engineering personnel.

461. ACTION.

a. Regions. Regional Airway Facilities Division and AVN-100 coordination is essential. AVN-100, having planned Category II and III ILS runways in its area of responsibility, shall issue checklists to assure the system meets the necessary ground system and obstacle clearance requirements. See Order 8400.8.

NOTE: The requirements for the marking of ILS glide slope (GS) and localizer (LOC) obstacle free zones, and procedures for ensuring obstacle clearance with respect to aircraft on the ground, are contained in AC 150/5300-13, Airport Design.

b. AVN-100.

(1) AVN-100 shall forward the completed checklists to the Flight Operations Branch, AFS-410. AVN-100 shall advise the regional Flight Standards Division (FSD) when a Category II or III system has passed flight inspection. Notification shall contain the following information:

(a) Airport.

(b) Runway.

(c) Flight inspection completion date.

(d) Facility classification.

(e) Minimums:

Category II DA and RA.
Category III a/b/c RVR (as appropriate).

(f) Date approach procedure will be available.

(g) Status of SMGCS Plan (from regional AWO).

(2) Amend ILS SIAP's when Categroy II, IIIa, IIIb, and IIIc minimums are authorized. Where only Category II and IIIa are authorized, indicate Category IIIb and IIIc as not authorized (NA) (see paragraph 813k).

(3) Irregularities in pre-threshold terrain or HUD/autoflight system/radar altimeter characteristics might adversely affect radar altimeter indications and thus affect autoland performance of some aircraft (see paragraph 462). Until or unless these aircraft demonstrate normal radar altimeter readings and acceptable HUD/autoland operations on that runway, and this fact is listed in their operations specifications, they cannot conduct Category III HUD/autoland operations. AFS-410 acts as the clearing house for listing which combinations of autoflight systems/ runways are or can be approved, and is positioned for receipt of information from Flight Inspection, AAF, Airports, and airport authorities regarding irregular underlying terrain situations at new runways or runways at which future Category II/III procedures are proposed.

c. The Flight Inspection Technical Support Branch, AVN-210, shall maintain the current ILS performance classifications in the Aviation Standards Information System (ASIS) database. The regional Airway Facilities Division shall notify the Flight Standards Division and AVN-210 of individual ILS facility performance classification determinations, and any change in the performance class of a facility, so that changes in Category III authorizations can be made.

d. The regional FSD will provide user notification to AFS-410 when Category II or III operations are authorized. Notification shall contain the information obtained from AVN-100 (see paragraph 461b(1).

e. AFS-410 will update the Flight Standards Bulletin Board (BBS). This notification will provide ATA and operators with the planned availability of the new minimums for preparation of operations specifications, and autoland "testing" prior to publication of the SIAP.

462. RADIO ALTIMETER HEIGHTS.

The methodology used in computing radio altimeter setting is contained in Order 8260.23, Calculation of Radio Altimeter Height. Establish radio altimeter heights by utilizing the as-built approach light system (ALS) vertical profile drawings or drawings of equal accuracy. Use terrain elevations on the runway centerline extended to compute radio altimeter heights (see paragraph 461b(2)).

463. NOTAM REQUIREMENTS.

When any component of the ILS system fails to meet the appropriate performance tolerances, Airways Facilities issues a NOTAM (D) for suspension of Category II/III minimums. If the suspension will exist longer than 224 days or will be permanent, AVN-100 shall issue an FDC P-NOTAM or amend the 8260-series form deleting Category II and/or III minimums from the procedure (see also paragraph 224f(4).

464. WAIVER REQUIREMENTS.

When required, AVN-100 shall prepare a waiver request on Form 8260-1, in accordance with chapter 2, section 12, of this order.

465-469. RESERVED.

SECTION 7. DEPARTURE PROCEDURES (DP)

470. GENERAL.

a. AVN-100 is responsible for the development of instrument departure procedures (DP's) under Order 8260.46, Instrument Departure Procedure (DP) Program, and for the issuance of NOTAM's relating thereto.

b. Establish takeoff minimums or develop departure procedures only for those airports with approved instrument approach procedures.

c. When the AVN-100 study reveals obstacles requiring climb gradients greater than 200 feet per mile, a DP is required. Specific procedures shall include: a note placed in the Take-Off Minimums and (Obstacle) Departure Procedures section of the Terminal Procedures Publication (TPP) to enable the pilot to see and avoid obstacles that require a climb gradient (CG) (see paragraph 835d(2)(a)4 and TERPS Chapter 12); mandatory ceiling and visibility minimums to allow obstacles to be seen and avoided; establishment of standard takeoff minimums with required CG's; detailed textual or graphic flight maneuvers; a combination of these methods; or denial of an instrument departure. See table 4-1 for allowable combinations relating to specific situations.

(1) A ceiling and visibility shall not be published for obstacles identified under TERPS paragraph 1205d. See table 4-1, situation 2.

(2) Where CG's are required for obstacles within and also beyond **3 SM** of DER, publish a graphic DP. Where operationally practicable, CG's may be combined with publication of the more demanding CG's to an altitude that clears all obstructions.

(3) Whenever mandatory ceiling and visibility are used to allow obstacles to be seen and avoided, they shall be accompanied by an alternative to use standard take-off minimums with a minimum required climb gradient

TABLE 4-1

SITUATION	ACTION
1) TERPS obstacle assessment does not identify any obstacle penetrations; i.e., diverse departure evaluation successful.	No further action required - standard takeoff minimums apply.
2) TERPS obstacle assessment identifies only obstacles that require a CG to an altitude 200′ or less above DER.	Establish a DP which provides the pilot a note identifying the obstacle(s) type, location relative to the DER, height (AGL) and elevation.
3) TERPS obstacle assessment identifies obstacles that require a CG to an altitude greater than 200′ above the DER.	*A)* Obstacle **3 SM** or less from DER: Establish a DP which provides the pilot a note identifying the obstacle(s) type, location relative to the DER, height (AGL) and elevation, and which specifies: 1) a ceiling and visibility to see and avoid the obstacle; with 2) standard takeoff minimums with a minimum CG to a specified altitude; and/or 3) provide a specific textual or graphic route to avoid the obstacle(s). Include takeoff minimums and/or CG's as necessary for each runway served. *B)* Obstacle greater than **3 SM** from DER: establish a DP for obstacle avoidance that uses standard takeoff minimums with a required CG; or provide a textual or graphic departure route to avoid the obstacle(s). **NOTE:** Include takeoff minimums and/or CG's on the graphic DP. If neither of these actions is feasible, an IFR departure shall not be authorized.

4) TERPS obstacle assessment identifies obstacles requiring a CG to 200′ or less above DER and additional obstacles that require a CG to an altitude greater than 200′ above DER.	Apply a combination of action items from 2) and 3) above as appropriate.

d. Least Onerous Route.

(1) When climb gradients greater than 200′ /NM are required in conjunction with a detailed flight maneuver, the obstacle DP route shall be established over terrain or other obstacles which results in the lowest possible climb gradient for that runway or airport.

(2) Consideration shall be given to pilot workload and other aircraft performance requirements such as number of turns, NAVAID communication frequency changes, navigation system complexities, etc.

(3) It is essential that AVN-100 fully coordinate with the controlling ATC facility in the development of this routing to ensure flight safety is maintained; i.e., that the basic requirements of least onerous routing are not in conflict with existing ATC routing and airspace design/structure.

e. Order 8260.3, Chapter 12 requires application of diverse departure criteria to all runways authorized for instrument departures.

(1) Successful diverse criteria evaluation ensures that aircraft are capable of departing in any direction from a runway and a textual or graphic DP is not required for obstruction clearance. Therefore, standard takeoff minimums apply and a Form 8260-15 is not required.

(2) When the diverse criteria evaluation indicates a requirement for a specific departure routing for obstruction avoidance, develop a textual or graphic DP using the least onerous route to the en route structure. This procedure will be charted as the default IFR departure procedure for obstruction clearance. There shall only be **one** default DP developed for each runway. The default DP should be textually depicted; however, when a graphic depiction is required (see paragraph 471), the name of the default graphic DP for the pilot to use shall be stipulated on the Form 8260-15A in the “TAKE OFF MINIMUMS” section (see paragraph 835d(2)(a)4); e.g., “USE JONES DEPARTURE.”

471. PUBLICATION.

a. When detailed flight maneuvers are established for obstacle avoidance or for ATC purposes, they are documented as "DEPARTURE PROCEDURES" on Forms 8260-15A, B, and C, as specified in paragraphs 833 and 835, or 8260-7. DP’s required for obstacle avoidance may be either a stand alone textual or graphic procedure. Textual DP’s are simple, may include a climb gradient requirement, and no more than one turn and/or altitude change. More complex DP’s, involving climb gradient requirements, multiple turns, and/or altitude changes shall be graphically depicted. Develop RNAV DP’s and DP’s required for ATC purposes as graphic departures.

b. Departure procedures should place the aircraft in the en route strata expeditiously, but should also reflect the realities of ATC system requirements. AVN-100 shall coordinate with ATC to assure, whenever practicable, that departure procedures reflect the commonly used routing out of each airport. When ATC routing requirements are not a factor, develop the default DP based on the least onerous obstacle based routing to the en route system.

c. DP’s shall accommodate ATC and obstacle clearance requirements with regard to minimum fix crossing altitudes and climb gradients. When application results in dual altitudes over a fix and/or dual CG's, both shall be documented on the appropriate Form 8260-15. Document the ATC altitude followed by the obstacle altitude in parenthesis; e.g., 9,000 (6,500). When ATC and obstacle altitude requirements are separated by 500′ or less, they may be combined and only the higher value charted as a minimum altitude. Climb gradient requirements shall be assumed to be the minimum required for obstruction clearance purposes unless annotated “ATC” in parenthesis; e.g., 400′/NM to 3,000; 450′/NM to 2,000 (ATC).

d. "Runway heading" is defined in the Pilot/Controller Glossary of the Aeronautical Information Manual (AIM) as "the magnetic direction that corresponds with the runway

centerline extended, not the painted runway numbers." The glossary further states that pilots cleared to "fly or maintain runway heading" are expected to fly or maintain the heading that corresponds with the extended centerline of the departure runway (until otherwise instructed by ATC), and are not to apply drift correction; e.g., RWY 4, actual magnetic heading of the runway centerline 044°, fly 044°.

e. Terminology.

(1) Departure instructions shall specify **"Climb runway heading...".** Alternatively, specific heading may be used if necessary to avoid obstacles.

(2) Do NOT use the terminology "Climb to (altitude)..." without including a heading to fly. INSTEAD, use **"Climb runway heading (or specified heading) to (altitude)...".**

(3) Do NOT use the terminology "Climb straight ahead...", as there is no guidance or reference definition of this phraseology for the pilot to apply.

472-479. RESERVED.

SECTION 8. STANDARD TERMINAL ARRIVAL ROUTES (STAR)

480. INTRODUCTION.

a. Air Route Traffic Control Centers (ARTCC) submit STAR's to AVN-100 through the regional ATD for review. ARTCC's are responsible for issuance of NOTAM's for STAR's.

b. AVN-100's review shall ensure obstacle clearance requirements; accuracy of courses, distances, and coordinates; clarity and practicality of the procedures; and assurance of navigational guidance adequacy. AVN-100 shall coordinate any discrepancies, required adjustments, or improvements noted during the review process and/or flight inspection with the sponsoring air traffic facility.

481. AVN-100 ACTION.

a. STAR's.

(1) Ensure that the STAR commences at a charted high or low altitude en route fix.

(2) Verify, **in conjunction with flight inspection**, that minimum en route altitudes provide required minimum obstruction clearance altitudes (MOCA) and meet minimum reception altitudes (MRA), communication, and airspace requirements.

(3) Verify obstacle clearance requirements are met for lost communications instructions provided by the ARTCC. If the ARTCC did not provide lost communications instructions, and it is determined that obstacles/terrain present a potential problem, **coordinate** with the ARTCC for resolution of the matter.

(4) Incorporate, **where possible, the STAR** termination fix into the SIAP as a feeder/initial approach fix.

(5) Verify entry into maximum authorized altitude (MAA) from available documentation; e.g., flight inspection reports, expanded service volume (ESV) reports, etc.

b. General.

(1) Review from the pilot's standpoint. The procedure must be flyable and should be as simple as possible. Use clear, concise, and standard phraseology. Request flight inspection assistance.

(2) Ensure, in conjunction with flight inspection, that facility performance will support the procedure. This may require preparation of materials such as maps and ESV's to support facility flight inspection.

(3) Verify the accuracy of courses, distances, and coordinates.

(4) Return the signed form to the regional ATD for further processing.

(5) Retain a copy of each approved form with charts, computations, and supporting data to facilitate future reviews.

(6) Include normal distribution copies of Form 8260-2 for ATA-100 and ARTCC in the package forwarded to the regional ATD.

482-499. RESERVED.

CHAPTER 5. AIRSPACE

SECTION 1. OBSTRUCTION EVALUATION (OE).

500. GENERAL.

14 CFR Part 77 requires that the Administrator be notified prior to the construction or alteration of structures which might present a hazard to flight. Form 7460-1, Notice of Proposed Construction or Alteration, is the medium for that notification of construction or alteration.

501. RESPONSIBILITY AND PROCESSING OF FAA FORM 7460-1.

The Regional ATD has the responsibility to process all Forms 7460-1 in accordance with 14 CFR Part 77 and Order 7400.2, Procedures for Handling Airspace Matters. In this regard, AVN-100 shall ensure that a complete evaluation of the effect the proposed construction or alteration will have on IFR aircraft operations, including the visual portion of an IFR procedure, is provided to Air Traffic. AVN-100 shall also assist Air Traffic in reconciling possible discrepancies in IFR findings made by military services. Additionally, the Regional Flight Standards Division, All Weather Operations Program Manager, shall serve as the focal point for assessing VFR operational impact. Initial impact assessments should be made by the FPO and FSD. Headquarters-level case reviews shall be accomplished by AVN-100 (IFR) and AFS-420 (VFR).

502. REVIEW OF NOTICES.

AVN-100 and Flight Standards personnel normally involved in the evaluation of Notices of Construction or Alteration should be thoroughly familiar with applicable parts of Order 7400.2. The effect of a proposed structure on aircraft operations should be fully stated. Consultation with the appropriate FSDO and/or AVN-200 may be helpful in formulating recommendations. The following should be con-sidered:

a. Effect on VFR Traffic. When requested by Air Traffic, Flight Standards shall assess the effect upon VFR routes, airports/terminal operations, or other concentrations of VFR traffic. Air Traffic is responsible, under Order 7400.2 for assessing VFR traffic pattern impact; Flight Standards provides assistance in this area as requested.

b. Terminal Area IFR Operations. AVN-100 shall assess the effect upon terminal area IFR operations to include approach/departure procedures, transitions, radar vectoring charts, holding patterns, and STAR's. The study shall assess the effect upon any segment of an existing or proposed instrument approach/departure procedure and any restrictions.

c. En Route IFR Operations. AVN-100 shall assess the effect upon en route IFR operations to include MEA's, MOCA's, MCA's, MHA's, MIA charts, and turning areas.

d. Accuracy. All studies shall be made assuming the obstruction will be built or modified to the height specified in the study. If the proposed obstruction qualifies as the controlling obstacle for an IFR procedure, re-evaluate the proposed structure for impact using a 4D accuracy code. This impact shall be forwarded to Air Traffic as the IFR impact. However, AVN-100 shall also provide the survey accuracy required to mitigate the impact; i.e., "a surveyed accuracy of 'xx' horizontally and 'xx' vertically will result in either reduced or no IFR impact." (See chapter 2, section 11.)

e. NAVAID Interference. When informed by Air Traffic that it has been determined by Airway Facilities and/or frequency management personnel, that there may be interference with facility performance, AVN-100 determines the effect upon any instrument flight procedure. This includes radio or NAVAID interference through inter-modulation, overload, spurious or harmonic conditions which affect the receiver performance. Provide protection for all IFR areas and altitudes.

f. Adjustments to Instrument Flight Procedures. During negotiations with proponents or when requested by Air Traffic, AVN, or AFS, specialists should provide what procedure adjustments can be made to mitigate the effect without adversely affecting the procedure. AVN-100 shall not amend a procedure until receipt of the "Actual Notice of Construction," or other

notification relative to an obstacle which will have a procedural effect. If, during a procedural review or while on a site visit, it becomes obvious for safety reasons that the existence of a previously unknown obstacle requires procedure minimums to be increased, expedite accomplishment of the change by means of a NOTAM.

g. Statement of Adverse Impact. If the proposed construction or alteration will have an adverse effect on VFR or IFR aircraft operations, procedures, or minimum IFR flight altitudes, AVN-100 and Flight Standards evaluations should clearly state the extent of these effects. Air Traffic is responsible for making the final determination of whether adverse impacts are "substantial" or "minimal."

h. AC 70/7460-1 Obstruction Lighting and Marking. AVN-100 and Flight Standards personnel should be familiar with this advisory circular so that appropriate remarks can be made regarding the requirements therein. This is especially important where exceptions from lighting and marking standards have been requested by the applicant.

503. OBSTRUCTIONS UNDER SUBPART C, 14 CFR PART 77.

Construction or alterations identified as obstructions based on the standards of Subpart C, although not automatically hazards to air navigation, are presumed to be hazards to air navigation until an FAA study has determined otherwise.

SECTION 2. DESIGNATION OF CONTROLLED AIRSPACE

504. GENERAL.

To afford separation from other aircraft all instrument flight procedures shall be contained in controlled airspace to the maximum extent possible within the capabilities of the ATC system. DF procedures are exempt from this policy. For special procedures, refer to paragraph 402c.

505. AT RESPONSIBILITY.

It is the responsibility of the regional ATD to determine the type and amount of controlled airspace that can be established to encompass instrument flight procedures, including departures from the airport.

506. AVN-100 ACTION.

a. Determine airspace requirements for all original IAP's. Analyze IAP amendments which affect any fix, course, or altitude, to determine if existing airspace must be extended or can be reduced. Similarly, analyze IAP cancellations to determine if existing airspace can be reduced. AVN-100 shall coordinate with the ATC to determine if further procedure development needs to be delayed pending any airspace action.

b. AVN-100 analysis, in accordance with the provisions of this section, shall include, in part, a determination of the minimum required length and width of the Class B/C/D/E Surface Area extensions, and/or any Class E 700' airspace extension.

c. Document data, as described in paragraph 507k, on the Form 8260-9, Standard Instrument Approach Procedure Data Record, which supports the IAP being designed. (See paragraph 909 "Remarks" for forms completion guidance.) Forward this data to the appropriate regional AT office.

NOTE: This information may also be entered on any form considered acceptable by AVN-100 and the ATD; however, to avoid loss of data, it is strongly recommended that AVN m*ake the entry in* Form 8260-9, REMARKS, for *permanent record.*

507. TERMINAL AIRSPACE.

The following criteria shall be used to determine the required minimum length and width of Class B/C/D/E Surface Area and/or Class E 700' airspace extensions.

a. The requirement to designate controlled airspace is contained in Order 7400.2, Part 6.

b. The nearest 100′ principle shall be applied in determining the height of the controlling terrain. Example: A terrain elevation of 249.99' MSL would be considered as 200'; 250.00' MSL as 300'.

NOTE: Use of the following computation methods MUST consider the primary area of all applicable segments of any IAP under analysis. Any arrival extensions must be the result of "worst-case scenario" analyses, reflecting the greatest amount of controlled airspace required.

c. Class B/C/D/E Surface Area Extensions. Establish an extension of the Class B/C/D/E Surface Area whenever an IAP authorizes descent to an altitude less than 1,000' above the surface at a point outside the basic surface area. Where multiple approach procedures are established utilizing the same approach course, the extension length and/or width shall be based on the approach, or approach combinations, requiring the greatest length and/or width respectively.

(1) Precision approach procedures. Where ILS/MLS procedures are involved, the 1,000' point is established by determining the elevation of the highest terrain in the final approach primary area. Add 1,000' to this figure and subtract the threshold/GPI elevation. Then divide the result by the GS tangent, and subtract the GPI to threshold distance. The result is the distance from the threshold to the 1,000' point (see figure 5-1).

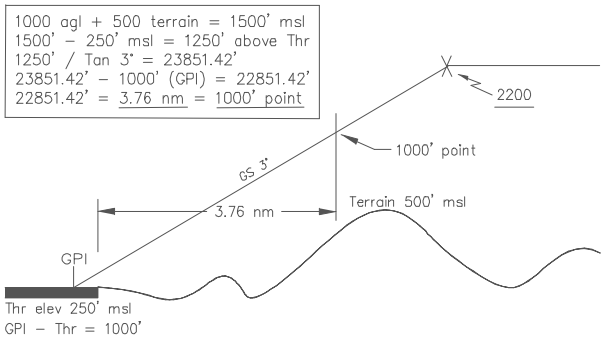

Figure 5-1

(a) When the GS (or EL) is inoperative, the altitude for flying the LOC-only (or AZ-only) may require an additional Class B/C/D/E Surface Area (control zone) extension. Therefore, the 1,000' point for LOC-only (or AZ-only) should be determined in the same manner as for nonprecision SIAP's (see paragraphs 507c(2) through (4)).

(b) To locate a 1,000′ point in a segment prior to the FAF, apply the provisions of paragraphs 507c(2) through (5).

(2) Nonprecision approach procedures. (NoPT w/FAF):

(a) When the SIAP specifies a minimum altitude at the FAF greater than 1,000' above the highest terrain in the final segment, the 1,000' point is assumed to be inbound from the FAF at a distance determined by application of a descent gradient of 500'/NM for distances in excess of 7 NM from runway threshold, and 300'/NM for distances at/less than 7 NM from the runway threshold; i.e., use both gradients to compute the 1,000' point when the final segment is longer than 7 NM (see figures 5-2 and 5-3).

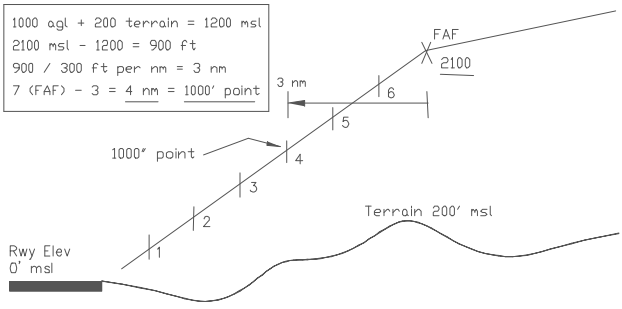

Figure 5-2

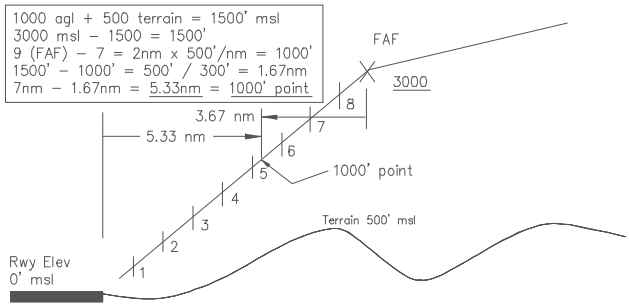

Figure 5-3

(b) When the SIAP specifies a minimum altitude at the IF greater than 1,000' above the highest terrain in the intermediate segment, the 1,000' point is assumed to be inbound from the IF at a distance determined by application of a 500'/NM descent from the IF (see figure 5-4).

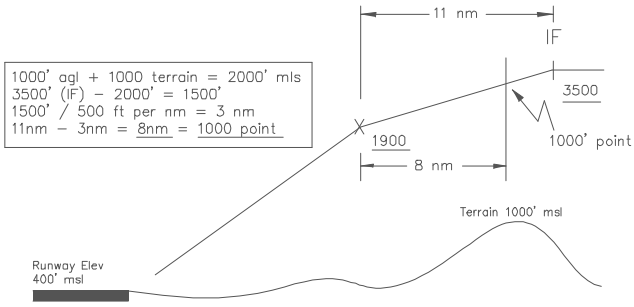

Figure 5-4

(3) Nonprecision approach procedures with Procedure Turn (PT):

(a) Procedure turn over facility (on-airport, no-FAF): Where a facility is located on the airport (NDB, VOR, VORTAC) and the SIAP does not incorporate FAF, the 1,000' point is assumed to be 7 NM outbound beyond the facility for a 10-mile PT, and 5 NM outbound for a 5-mile PT.

(**b) Procedure turn over FAF**:

1. When the SIAP specifies a minimum altitude at the FAF less than 1,000' above the highest terrain in the intermediate segment, the 1,000' point is assumed to be 7 NM outbound beyond the FAF for a 10-mile PT, and 5 NM outbound for a 5-mile PT (see figure 5-5).

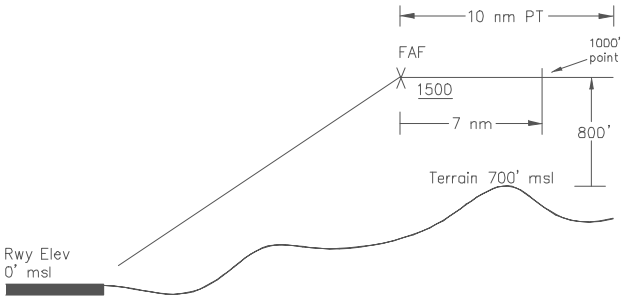

Figure 5-5

2. When the SIAP specifies a minimum altitude at the FAF less than 1,000' above the highest terrain in the final segment, BUT greater than 1,000' above the highest terrain in the intermediate segment, establish the 1,000' point at the FAF.

3. When the SIAP specifies a minimum altitude at the FAF greater than 1,000' above the highest terrain in the final segment, establish the 1,000' point as per paragraph 507c(2)(a).

(c) PT over facility/stepdown fix AFTER the FAF:

1. Where the SIAP specifies a minimum altitude at the FAF less than 1,000' above the highest terrain in the intermediate segment, the 1,000' point is assumed to be outbound beyond the FAF at a distance determined by application of a 200'/NM descent to the FAF (see figure 5-6).

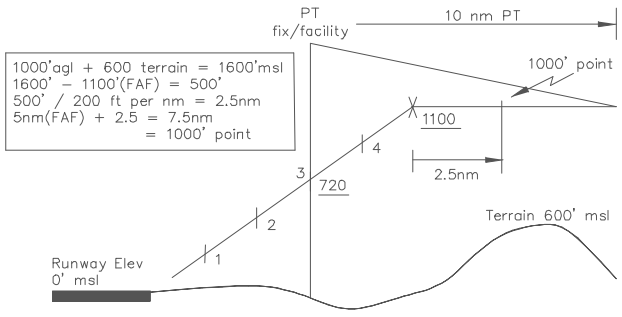

Figure 5-6

2. Where the SIAP specifies a minimum altitude at the final stepdown fix less than 1,000' above the highest terrain in the final segment, while specifying a minimum altitude at the FAF greater than 1,000' above the highest terrain in the intermediate segment, the 1,000' point is assumed to be inbound from the FAF at a distance determined by application of a 300'/NM descent gradient from the FAF. Use 500'/NM descent gradient for the distance that the FAF exceeds 7 NM from the threshold (see figure 5-7).

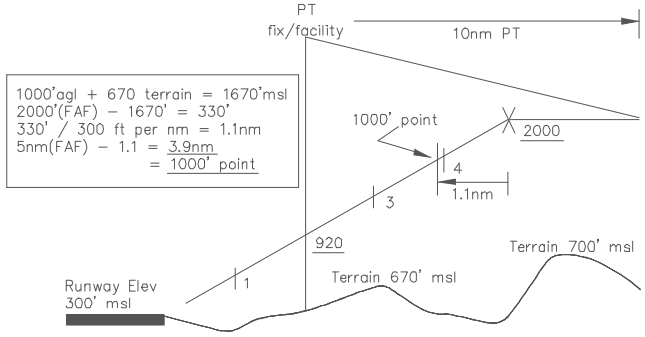

Figure 5-7

3. Where the SIAP specifies a minimum altitude at the final stepdown fix greater than 1,000' above the highest terrain in the final segment, the 1,000' point is assumed to be inbound from the final stepdown fix at a distance determined by application of a 300'/NM descent gradient from the final stepdown fix. Use 500'/NM descent gradient for the distance that the stepdown fix exceeds 7 NM from the threshold (see figure 5-8).

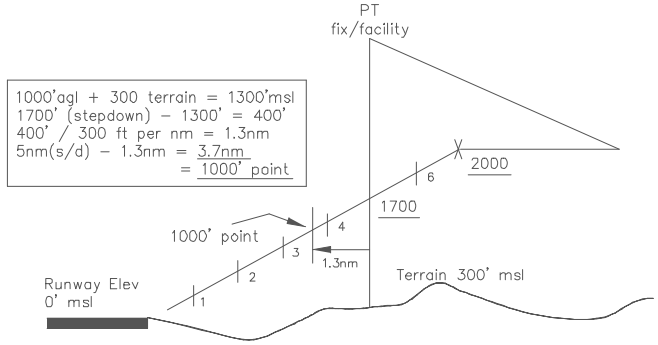

Figure 5-8

(d) Procedure turn over stepdown **PRIOR to the FAF:**

(**Condition:** Distance between the stepdown fix/facility and the FAF less than 5 NM - see TERPS paragraph 244d.)

1. If the PT **completion altitude** is equal to or greater than, BUT the minimum **altitude at the stepdown fix/facility** is less than 1,000′ above the highest terrain in the segment underlying the course reversal, the 1,000' point is assumed to be 7 miles from the stepdown fix/facility on the PT inbound leg (see figure 5-9).

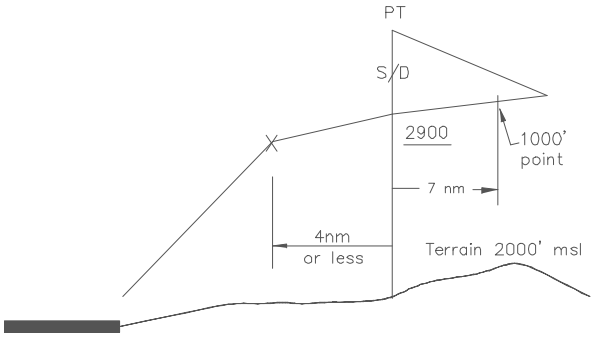

Figure 5-9

2. If the minimum **altitude at the stepdown fix/facility** is greater than 1,000' above the highest terrain in the segment between the fix/facility and the FAF, the 1,000' point is assumed to be inbound from the fix/facility at a distance determined by application of a 300'/NM descent from the stepdown fix/facility (see figure 5-10).

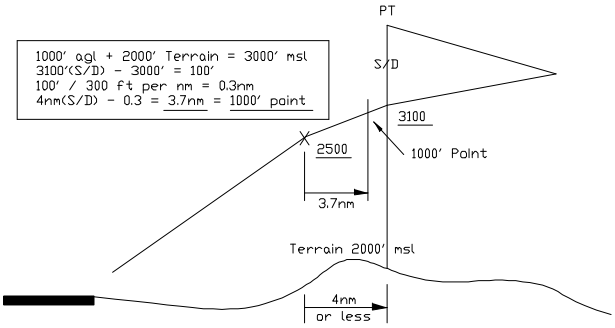

Figure 5-10

3. If the **1,000' point is inside the FAF**, apply methodology in paragraph 507c(2)(a).

(**Condition**: Distance between the stepdown fix/facility and the FAF greater than 5 NM - see Order 8260.3, paragraph 244e). Since the **fix/ facility becomes the IF** in this case, apply methodology in paragraph 507c(3)(e).

Note: Where the distance between the stepdown fix/facility and the FAF equals 5 NM, either TERPS paragraph 244d or 244e may be applied; use the appropriate guidance above or below accordingly.

(e) PT over the IF: (Intermediate Fix)

1. If the PT completion altitude is less than 1,000' above the highest terrain in the segment underlying the course reversal, the 1,000' point is in the PT maneuvering area.

2. If the PT completion altitude is greater than or equal to 1,000' above the highest terrain in the segment underlying the course reversal, the 1,000' point is assumed to be 7 NM from the PT fix/facility on the inbound leg (see figure 5-11).

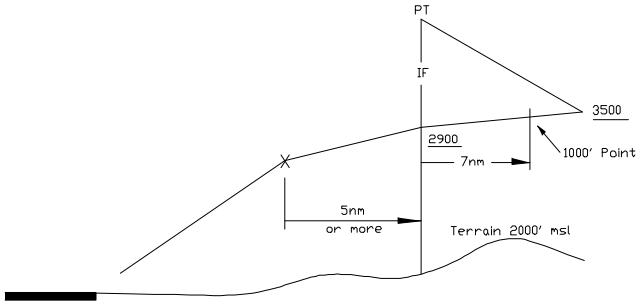

Figure 5-11

3. If the minimum **altitude at the IF** is greater than 1,000' above the highest terrain in the segment underlying the course reversal, BUT less than or equal to 1,000' above the highest terrain in the intermediate segment, the 1,000' point is at the IF (see figure 5-12).

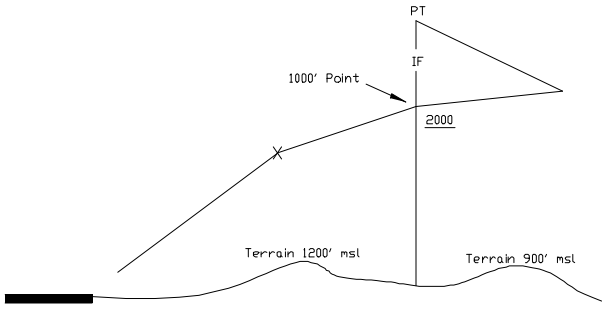

Figure 5-12

4. If the minimum **altitude at the IF** is greater than 1,000' above the highest terrain in the intermediate segment, the 1,000' point is assumed to be inbound from the IF at a distance determined by application of a 500'/NM descent from the IF (see figure 5-13).

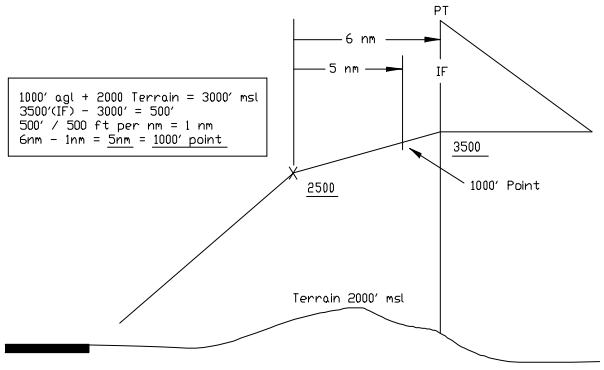

Figure 5-13

5. If the **1,000' point is inside the FAF,** apply methodology in paragraph 507c(2)(a).

(4) Hold-in-Lieu-of Procedure Turn:

(a) At the FAF:

1. If the minimum **altitude at the FAF** is 1,000' above the highest terrain in the final segment, the 1,000' point is at the FAF (see figure 5-14).

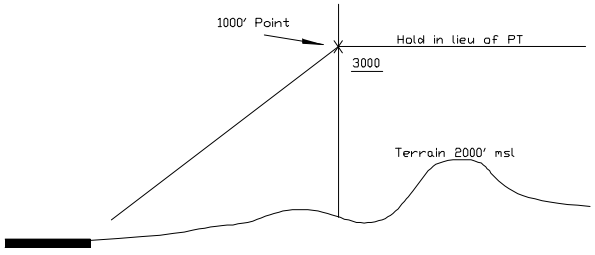

Figure 5-14

2. If the minimum **altitude at the FAF** is greater than 1,000' above the highest terrain in the final segment, apply the methodology in paragraph 507c(2)(a).

3. If the **minimum hold-in-lieu-of-PT altitude** is equal to or greater than, BUT the minimum altitude at the FAF is less than 1,000' above the highest terrain underlying the course reversal, the 1,000' point is assumed to be in the holding pattern area. The Class B/C/D/E Surface Area **(control zone)** extension must encompass the entire holding pattern primary area (see figure 5-15).

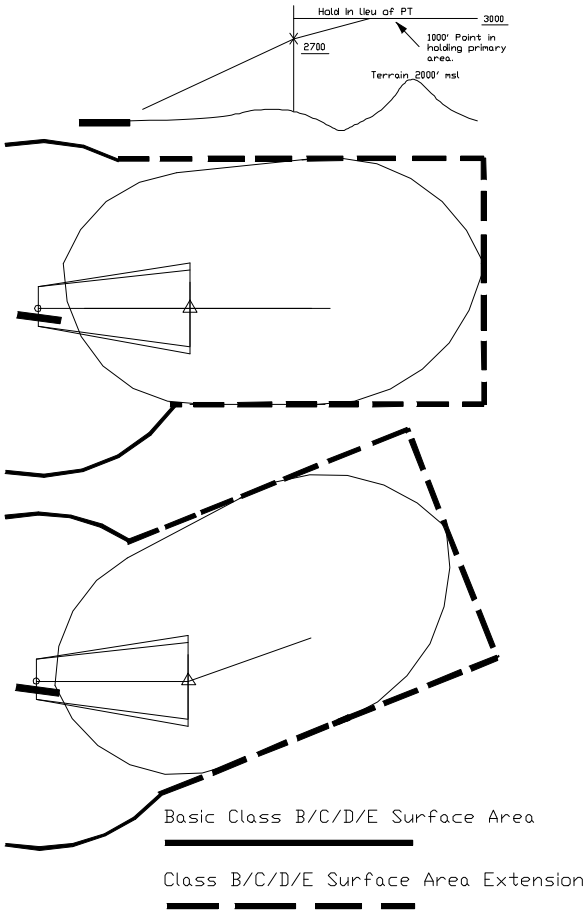

Figure 5-15

(b) At the IF:

1. If the minimum altitude at the IF is less than or equal to 1,000' above the highest terrain in the intermediate segment, the 1,000' point is at the IF (see figure 5-16).

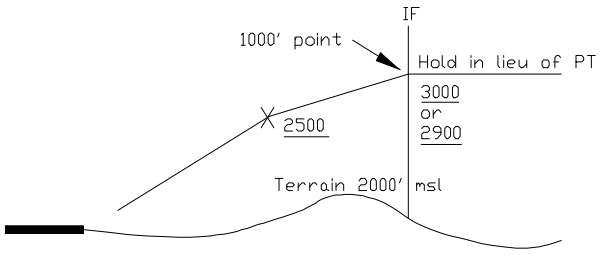

Figure 5-16

2. If the minimum **altitude at the IF** is greater than 1,000' above the highest terrain in the intermediate segment, the 1,000' point is assumed to be inbound from the IF at a distance determined by application of a 500'/NM descent from the IF (see figure 5-17).

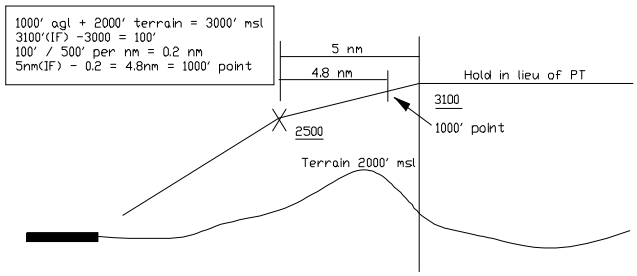

Figure 5-17

3. If the minimum altitude at the IF AND at the FAF are greater than 1,000' above the highest terrain in the intermediate segment, apply the methodology in paragraph 507c(2).

(5) General: For PT distances greater than 10 NM (out to 15 NM maximum), increase the distance to the assumed 1,000' point 1 NM for each mile in excess of 10 NM.

d. Class B/C/D/E Surface Area extension width.

(1) ILS/MLS: The width of the Class B/C/D/E Surface Area extension for ILS/MLS is established by determining the width of the precision final approach primary area at the point the aircraft reaches 1,000' AGL (see paragraph 507c(1)). The width of the extension shall not be less than 2 NM (1 mile each side of the localizer/azimuth course) regardless of the width of the precision primary area at the 1,000' point.

(a) Refer to figure 5-18. If the aircraft reaches 1,000' AGL at point A, the width of the surface area at point A is the same as the measured width of the ILS trapezoid at this point. Apply the provisions of paragraph 507c(1) to determine the distance from the threshold to the 1,000' point; then subtract 200'. The resultant figure is then used as "D" in the precision for determining the half-width of the precision primary area:

1/2W = .15D + 500'.

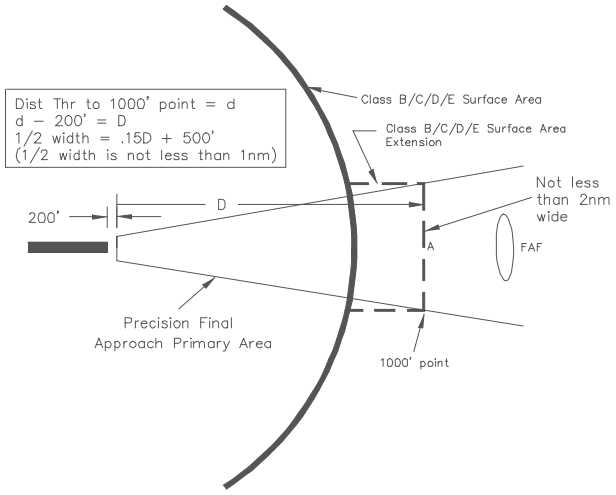

Figure 5-18

(b) Where the 1,000' point is located in the intermediate segment, additional analysis is required. Since the ILS or MLS FAF and the underlying LOC or AZ FAF may not be collocated, the respective intermediate segments may have different widths at any particular distance from the FAF. The **width** of the Class B/C/D/E Surface Area extension at the 1,000' point shall be the **greater** of the two segment widths. Use the guidance in TERPS chapter 2 for calculating the respective widths.

(2) Nonprecision: The width of the Class B/C/D/E Surface Area extension for other than ILS/MLS is established by measuring the width of the final approach primary area at the widest point between the surface area boundary and the 1,000' point. For final segments which expand toward the basic surface area boundary, the width is measured perpendicularly to centerline at the point where the course crosses the surface area boundary. Where Class B/C/D/E Surface Area has not been established prior to IAP development, obtain a tentative surface area dimension from the regional ATD for application of this paragraph. The width of the extension shall not be less than 2 NM (1 NM each side of segment centerline) (see figure 5-19).

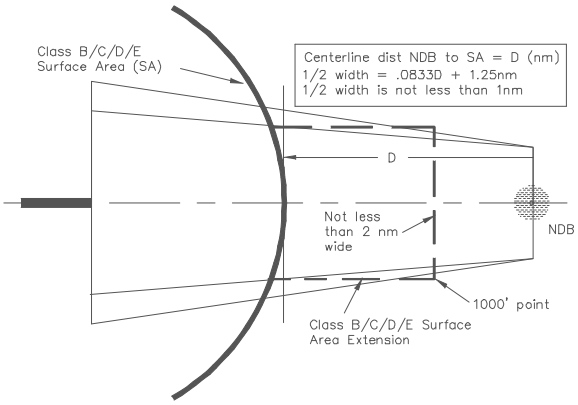

Figure 5-19

Where the 1,000' point is located in the intermediate segment, determine the segment width abeam the 1,000' point using the appropriate guidance in TERPS chapter 2.

e. Class E 700' airspace arrival extensions. A 700' Class E airspace extension should be established whenever a SIAP authorizes descent to less than 1,500' AGL. The **width** of the Class E 700' airspace extension is established equal to the width of the initial, intermediate, or final primary area at the widest point between the basic Class E 700' airspace and the point where the aircraft descends below 1,500' AGL. The methods used to locate the 1,500' point in a **precision final** are similar to those used to locate the 1,000' point. Refer to paragraph 506c(1) and use 1,500' in place of 1,000'. For **other precision segments, or for LOC/AZ,** refer to paragraphs 507e(1) through (3).

(1) No PT: Apply the methodology contained in paragraphs 507c(2)(a) and (b); except, where a 300'/NM descent gradient was used, apply a 500'/NM for the 1500' point determination. In figure 5-20, the aircraft will reach 1,500' AGL at 6 miles prior to the FAF using a 500'/NM descent gradient from the IF (see figure 5-20).

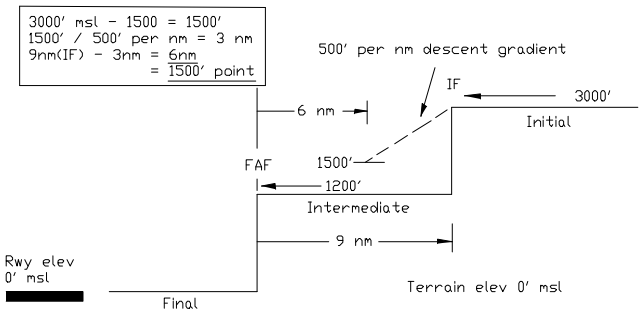

Figure 5-20

(2) Procedure Turn:

(a) On-airport no-FAF: For a **10-mile PT**, the 1,500' point is assumed to be 7 miles from the PT fix or facility on the inbound leg. Similarly, for a **5-mile PT,** the 1,500' point is assumed to be 5 miles from the PT fix or facility. HOWEVER, if the **PT completion altitude** is less than 1,500 feet above the highest terrain in the final segment underlying the course reversal, then the 1,500' point is in the PT maneuvering area (see paragraph 507k(7) and figure 5-21).

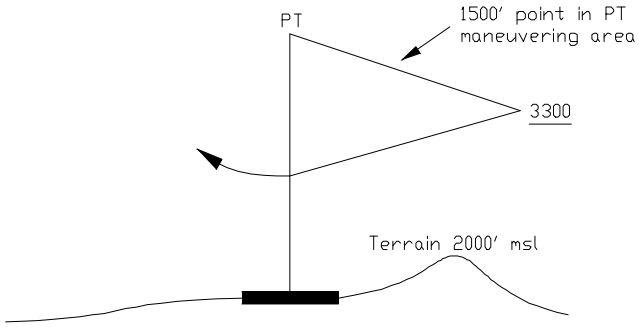

Figure 5-21

(b) PT over the FAF:

1. If the **PT completion altitude** is less than 1,500' above the highest terrain in the intermediate segment, the 1,500' point is in the PT maneuvering area (see paragraph 507k(7) and figure 5-22).

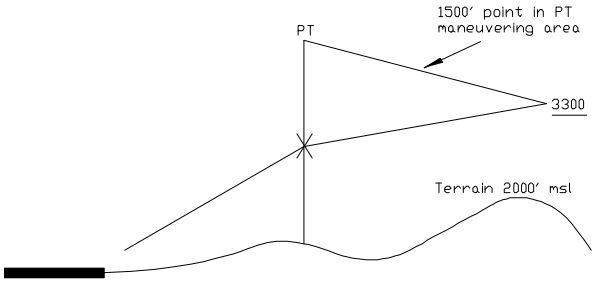

Figure 5-22

2. If the **PT completion altitude** is 1,500' or more above the highest terrain in the intermediate segment, the 1,500' point is assumed to be 7 miles from the PT fix or facility on the PT inbound leg (5 NM for a 5-mile PT) (see figure 5-23).

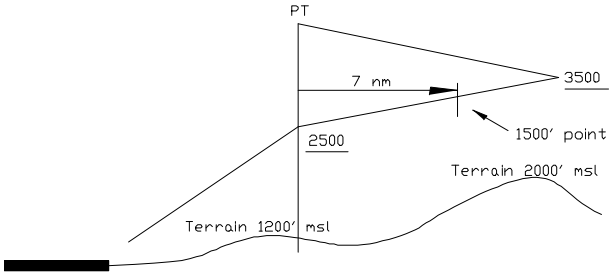

Figure 5-23

3. If the **FAF altitude** is greater than 1,500' above the highest terrain in the final segment, the 1,500' point is assumed to be inbound from the FAF at a distance determined by application of a 500'/NM descent gradient (see figure 5-24).

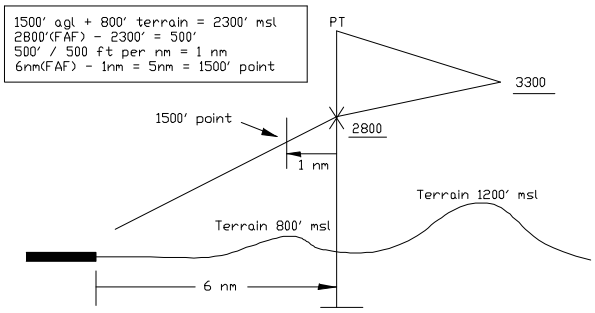

Figure 5-24

(c) PT over a stepdown fix AFTER the FAF:

1. If the **PT completion altitude** is less than 1,500' above the highest terrain in the segment underlying the course reversal, the 1,500' point is in the PT maneuvering area (see paragraph 507k(7) and figure 5-25).

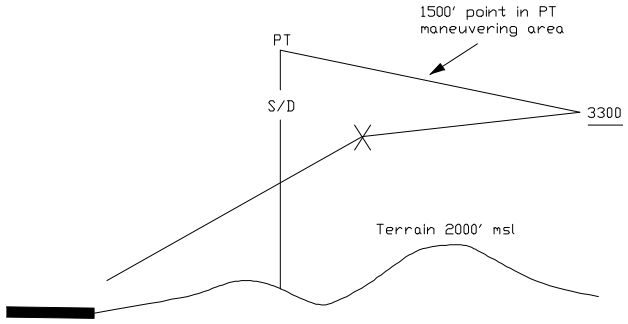

Figure 5-25

2. If the **PT completion altitude** is 1,500' or more above the highest terrain in the segment underlying the course reversal, the 1,500' point is assumed to be 7 miles from the PT fix or facility on the PT inbound leg (5 NM for a 5-mile PT) (see figure 5-26).

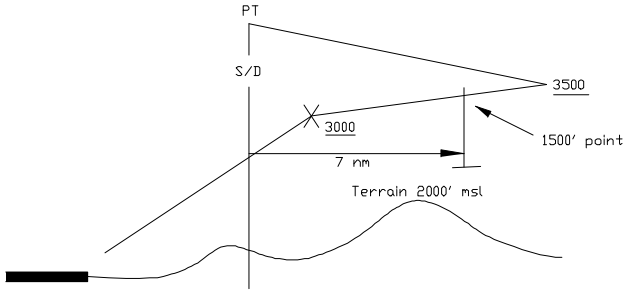

Figure 5-26

3. If the **FAF altitude** is 1,500' or more above the highest terrain in the segment underlying the course reversal or the final segment, the 1,500' point is assumed to be inbound from the FAF at a distance determined by application of a 500'/NM descent gradient (see figure 5-27).

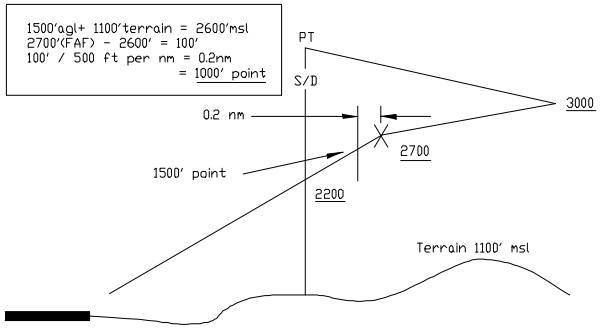

Figure 5-27

4. If the **stepdown fix/facility altitude** is 1,500' or more above the highest terrain in the final segment, the 1,500' point is assumed to be inbound from the stepdown fix/facility at a distance determined by application of a 500'/NM descent gradient (see figure 5-28).

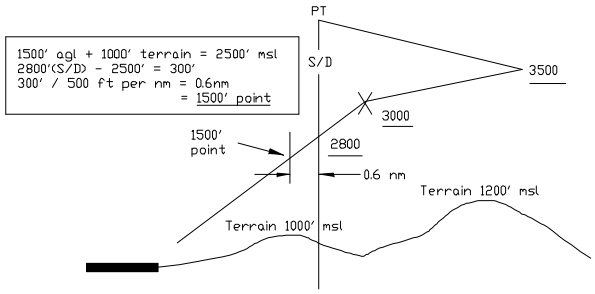

Figure 5-28

(d) PT over a stepdown fix **PRIOR to the FAF:**

(**Condition:** Distance between the stepdown fix/facility and the FAF less than 5 NM - see TERPS paragraph 244d)

1. If the **PT completion altitude** is less than 1,500' above the highest terrain in the segment underlying the course reversal, the 1,500' point is in the PT maneuvering area (see paragraph 507k(7) and figure 5-29.

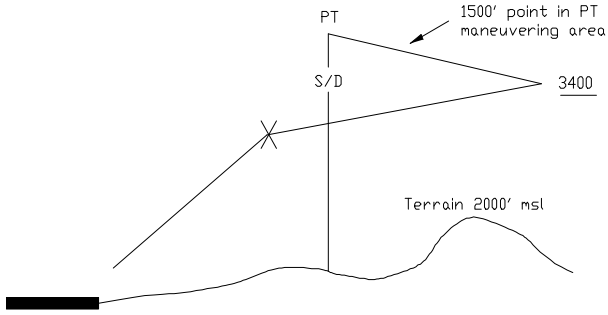

Figure 29

2. If the **PT completion altitude** is equal to or greater than, BUT the minimum altitude at the stepdown fix/facility is less than 1,500' above the highest terrain in the segment underlying the course reversal, the 1,500' point is assumed to be 7 miles from the stepdown fix/facility on the PT inbound leg (see figure 5-30).

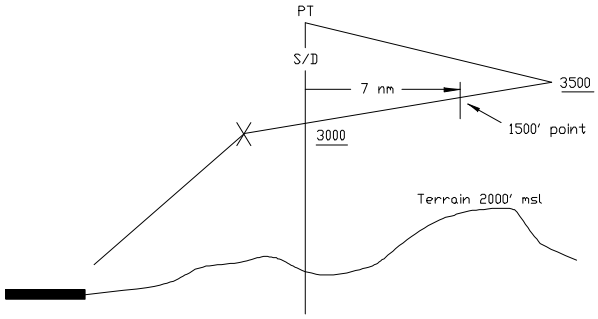

Figure 5-30

3. If the **stepdown fix/facility altitude** is 1,500' or more above the highest terrain in the segment between the fix/facility and the FAF, the 1,500' point is assumed to be inbound from the fix/facility at a distance determined by application of a 500'/NM descent gradient from the stepdown fix/facility (see figure 5-31).

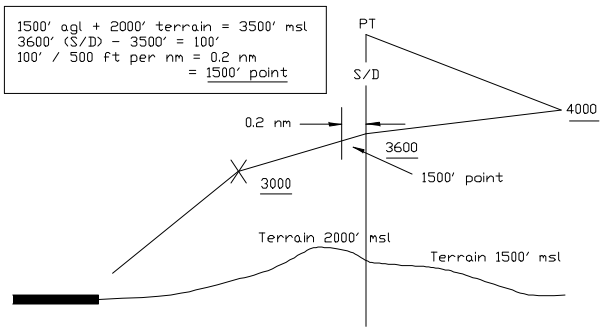

Figure 5-31

4. If the **1,500' point is inside the FAF,** apply the methodology in paragraph 507c(2)(a) using a 500'/NM descent gradient.

(**Condition**: Distance between the stepdown fix/facility and the FAF greater than 5 NM – see TERPS paragraph 244d). Since the **fix/facility becomes the IF** in this case, apply methodology for PT over the IF (see paragraph 507e(2)(e)).

NOTE: Where the distance between the stepdown fix/facility and the FAF equals 5 NM, either TERPS paragraph 244d or 244e may be applied; use the appropriate guidance in paragraph 507e(2)(d) or 507e(2)(e) accordingly.

(e) PT over the IF:

1. If the **PT completion altitude** is less than 1,500' above the highest terrain in the segment underlying the course reversal, the 1,500' point is in the PT maneuvering area (see paragraph 507k(7) and figure 5-32).

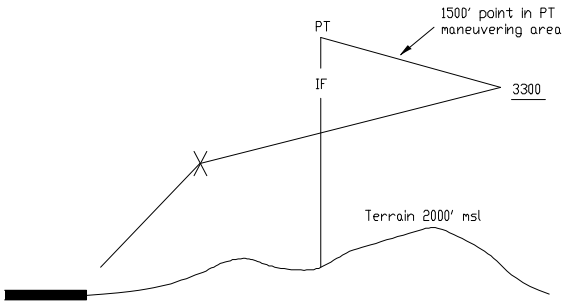

Figure 5-32

2. If the **PT completion altitude** is equal to or greater than 1,500' above the highest terrain in the segment underlying the course reversal, the 1,500' point is assumed to be 7 miles from the IF on the PT inbound leg (see figure 5-33).

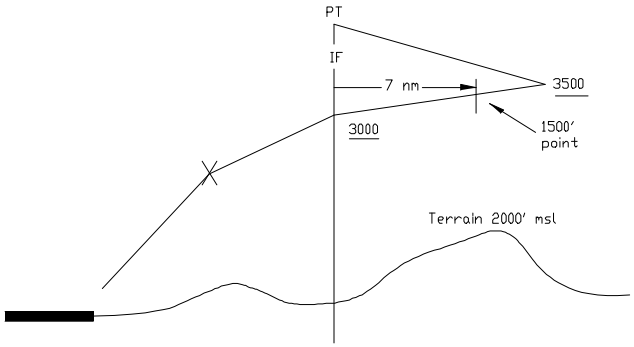

Figure 5-33

3. If the minimum **altitude at the IF** is equal to or greater than 1,500' above the highest terrain underlying the course reversal, BUT less than 1,500' above the highest terrain in the intermediate segment, the 1,500' point is at the IF (see figure 5-34).

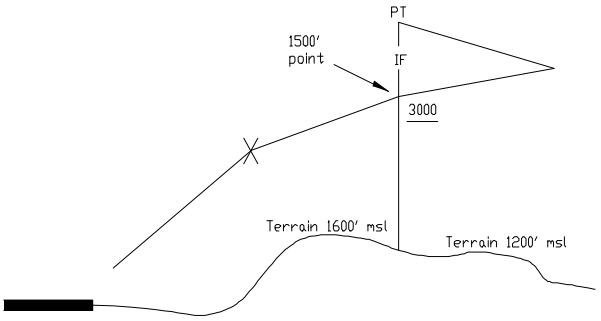

Figure 5-34

4. If the minimum **altitude at the IF** is greater than 1,500' above the highest terrain in the intermediate segment, the 1,500' point is assumed to be inbound from the IF at a distance determined by application of a 500'/NM descent gradient (see figure 5-35).

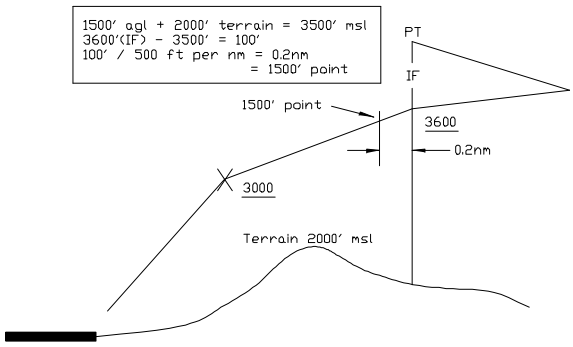

Figure 5-35

5. If the **1,500' point is inside the FAF,** apply the methodology in paragraph 507c(2)(b) using a 500'/NM descent gradient.

6. If the minimum **hold-in-lieu-of PT altitude** is equal to or greater than, BUT the minimum altitude at the FAF is less than 1,500' above the highest terrain in the segment underlying the course reversal, the 1,500' point is assumed to be in the holding pattern area. The Class E 700' airspace **(transition area)** extension must encompass the entire holding pattern primary area. Use the pattern size appropriate to the highest holding speed at the published holding altitude (see paragraph 507k(11) and figures 5-36 and 5-37).

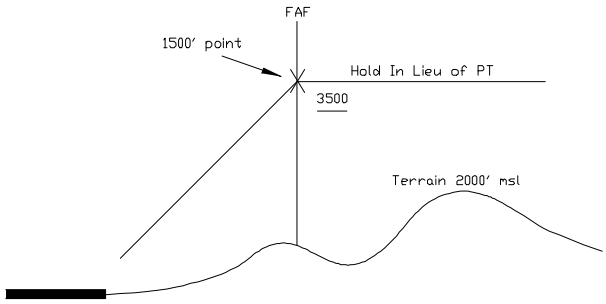

Figure 5-36

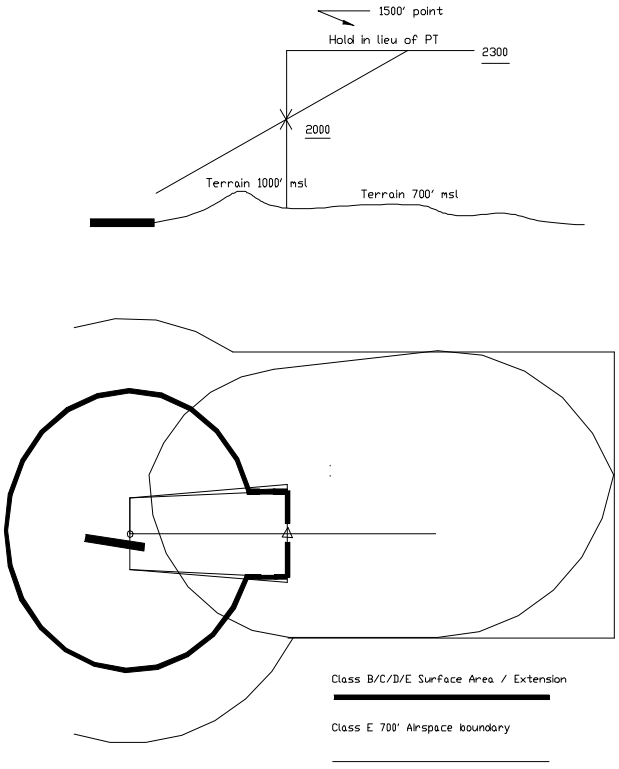

Figure 5-37

(f) At the IF:

1. If the minimum **altitude at the IF** equals 1,500' above the highest terrain in the intermediate segment, the 1,500' point is at the IF.

2. If the minimum **altitude at the IF** is less than 1,500' above the highest terrain underlying the holding pattern, the 1,500' point is in the holding pattern area. The Class E 700' airspace extension must encompass the entire holding pattern primary area. Use the pattern size appropriate to the highest holding speed at the published holding altitude (see paragraph 507k(7) and figure 5-38). Provide the appropriate AT office a drawing clearly depicting the airspace required (see paragraph 507k(11).

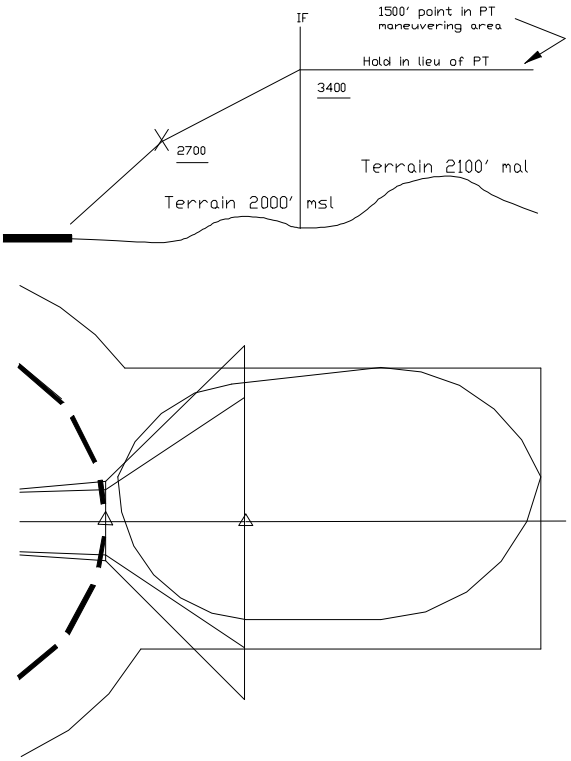

Figure 5-38

3. If the minimum **altitude at the IF** is greater than 1,500' above the highest terrain in the intermediate segment, the 1,500' point is assumed to be inbound from the IF at a distance determined by application of a 500'/NM descent gradient from the IF (see figure 5-39).

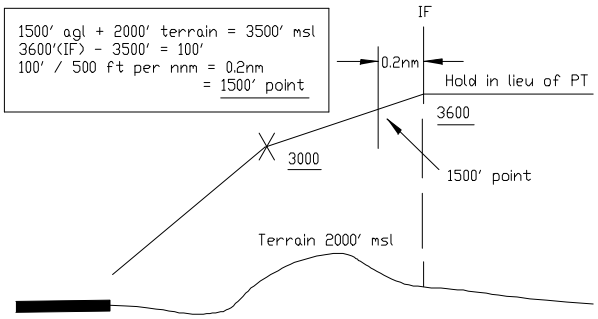

Figure 5-39

f. Missed Approach: Normally, it can be expected that the airspace required to encompass the IAP's or DP's at an airport will be sufficient to encompass that airspace required for missed approach procedures. This particularly applies to any need for Class B/C/D/E Surface Area extensions. Determine required airspace as follows:

(1) Draw the IAP missed approach segment areas on a sectional chart (or any other chart depicting controlled airspace).

(2) Establish a 700' Class E airspace area whenever an IAP authorizes aircraft operation at/below 1,500' AGL outside the basic Class B/C/D/E Surface Area. Where the clearance limit is reached prior to the 1,500' point, ensure the entire missed approach primary area is contained within Class E 700' airspace, including clearance limit holding, if required (see figure 5-40).

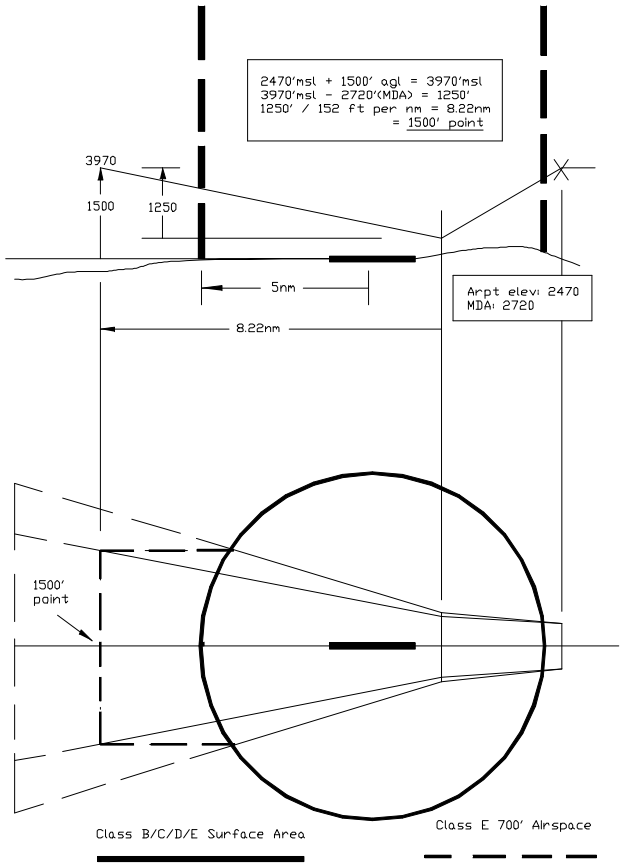

Figure 5-40

g. HI-VOR or NDB (No FAF).

(1) 1,000' Point:

(a) If the penetration turn completion altitude is equal to 1,000' above the highest terrain in the area prior to the 10-mile point, the 1,000' point is at the 10-mile point.

(b) If the penetration turn completion altitude is greater than 1,000' above the highest terrain in the area prior to the 10-mile point, the 1,000' point is assumed to be inbound from the turn completion point at a distance determined by application of a 500'/NM descent gradient.

(2) 1,500' point: Refer to TERPS table 2. The distance to the point of penetration turn completion and the "distance turn commences" from table 2 are assumed to be equal.

(a) If the penetration turn completion altitude is less than 1,500' above the highest terrain underlying the penetration turn, the 1,500' point is in the penetration turn area. Transition area boundaries must encompass the entire penetration turn area. Provide the appropriate ATC office a drawing clearly depicting the airspace required (see paragraph 507k(12)).

(b) If the penetration turn completion altitude is greater than or equal to 1,500' above the highest terrain underlying the penetration turn, AND less than 1,500' above the highest terrain in the straight segment prior to the 10-mile point, the 1,500' point is at the turn completion point.

(c) If the penetration turn completion altitude is greater than 1,500' above the highest terrain underlying the penetration turn in the straight segment prior to the 10-mile point, the 1,500' point is assumed to be inbound from the turn completion point at a distance determined by application of a 500'/NM descent gradient.

(d) If the FAF altitude is greater than 1,500' above the highest terrain in the final segment, apply the methodology in paragraph 507c(2)(a) using a 500'/NM descent gradient from the FAF.

h. HI-TACAN, VOR/DME, or VOR (with FAF).

(1) 1,000' Point:

(a) If the penetration turn completion altitude is greater than 1,000' above the highest terrain in the segment prior to the IF, the 1,000' point is assumed to be inbound from the turn completion point at a distance determined by application of a 500'/NM descent gradient.

(b) If the penetration turn completion altitude equals 1,000' above the highest terrain in the segment prior to the IF, the 1,000' point is at the IF.

(c) If the IF altitude is greater than 1,000' above the highest terrain in the intermediate segment, the 1,000' point is assumed to be inbound from the IF at a distance determined by application of a 500'/NM descent gradient.

(d) If the **FAF altitude** is greater than 1,000' above the highest terrain in the final segment, apply the methodology in paragraph 507c(2)(a).

(2) 1,500' Point:

(a) If the penetration turn completion altitude is less than 1,500' above the highest terrain between the turn completion point and the IF, the 1,500' point is in the penetration turn area.

(b) If the penetration turn completion altitude equals 1,500' above the highest terrain between the turn completion point and the IF, the 1,500' point is at the turn completion point.

(c) If the penetration turn completion altitude is greater than 1,500' above the highest terrain between the turn completion point and the IF, the 1,500' point is assumed to be inbound from the turn completion point at a distance determined by application of a 500'/NM descent gradient.

(d) If the IF altitude is greater than 1,500' above the highest terrain in the intermediate segment, the 1,500' point is assumed to be inbound from the IF at a distance determined by application of a 500'/NM descent gradient.

(e) If the FAF altitude is greater than 1,500' above the highest terrain in the final segment, apply the methodology in paragraph 507c(2)(a) using a 500'/NM descent gradient from the FAF.

i. Radar vector to FAF (Radar Required).

(1) If the FAF altitude is greater than 1,000' above the highest terrain in the final segment, apply the methodology in paragraph 507c(2)(a).

(2) If the FAF altitude is less than 1,000' above the highest terrain in the final segment, the 1,000' point is located PRIOR to the FAF (see paragraph 507k(4)).

(3) If the FAF altitude is greater than 1,500' above the highest terrain in the final segment, apply the methodology in paragraph 507c(2)(a) using a 500'/NM descent gradient from the FAF.

(4) If the FAF altitude is less than 1,500' above the highest terrain in the final segment, the 1,500' point is located PRIOR to the FAF (see paragraph 507k(7)).

j. Radar vector to IF (Radar Required).

(1) If the IF altitude is greater than 1,000' above the highest terrain in the intermediate segment, apply the methodology in paragraph 507c(2)(b).

(2) If the IF altitude is less than 1,000' above the highest terrain in the intermediate segment, the 1,000' point is located PRIOR to the IF (see paragraph 507k(4)).

(3) If the IF altitude is less than 1,500' above the highest terrain in the intermediate segment, the 1,500' point is located PRIOR to the IF (see paragraph 507k(7)).

(4) If the 1,500' point is at/inside the IF, apply the methodology in paragraph 507e(2)(b).

k. Information to be forwarded to ATC: See also paragraphs 506c and 909c(6).

(1) ARP coordinates; threshold coordinates (if straight-in authorized).

(2) FAF or IF coordinates.

(3) Distance from ARP (for circling-only), runway threshold (for straight-in), FAF, or IF to the 1,000' point. If applicable, state: **"1,000' point located outside FAF** (or IF) **- see current MVA Chart,"** and leave (5) blank.

(4) Width of the segment primary area at the widest point between the Class B/C/D/E Surface Area (control zone) and the 1,000' point; and the highest terrain elevation in the segment containing the 1,000' point (see paragraph 507d(2) and figure 5-19).

(5) True course (to the hundredth of a degree) of the segment in which the 1,000' point is located.

(6) Distance from ARP (for circling-only), runway threshold (for straight-in), FAF, or IF to the 1,500' point. If applicable, state: **"1,500' point located in the PT maneuvering area"**; or **"1500' point located in holding pattern area"**; or **"1,500' point located outside IF - see current MVA Chart"**; or **"1,500' point located outside FAF - see current MVA Chart"**; and leave (7) blank. (The regional AT office will then establish the transition area in accordance with Order 7400.2)

(7) Width of the segment primary area at the widest point between the Class E 700' airspace (transition area) and the 1,500' point; and the highest terrain elevation in the segment containing the 1,500' point (see paragraph 507e).

(8) True course (to the hundredth of a degree) of the segment in which the 1,500' point is located.

(9) Highest terrain elevation in the PT (or hold in lieu of PT) primary area excluding entry zone. Include holding pattern size.

(10) For high-altitude penetrations, paragraphs 507k(1) through (9), except paragraph 507k(2), apply. If applicable, state: **"1500' point located in the penetration turn area,"** and leave (8) blank.

l. SIAP Adjustment: Where the SIAP will not be derogated, consideration should be given to adjusting altitudes whereby the designation of unnecessary controlled airspace can be eliminated. The adjustment of altitudes should not be made where the descent gradients are increased above optimum.

m. Conversion: The appropriate Air Traffic office will convert the submitted nautical mile computations to statute miles to determine the actual dimensions required in accordance with Order 7400.2. However, AVN-100 shall review airspace dockets to determine that the proposed airspace encompasses the appropriate portions of the IAP consistent with the data forwarded in accordance with paragraph 507k.

SECTION 3. AIRPORT AIRSPACE ANALYSIS

508. GENERAL.

a. Public Law 103-272, Sections 40103b.1 and 44502, contain the basic authority for the FAA to conduct airport airspace analysis studies which culminate in an FAA determination. In order for the FAA to fulfill its obligations pursuant to the Public Law, Title 14 CFR Part 157, Notice of Construction, Alteration, Activation and Deactivation of Airports, was promulgated. This regulation requires proponents of the civil airport projects not involving federal funds to give the Administrator reasonable prior notice of such proposals so that he/she may be advised as to the effects the proposal will have upon the safe and efficient use of airspace by aircraft.

b. Other airport projects which are subject to airport airspace analysis studies include those eligible for airport improvement programs which are submitted to the FAA pursuant to Order 5100.38A, Airport Improvement Program (AIP) Handbook; the Military Construction Program (MCP), submitted to the FAA for review pursuant to Public Law, and Department of Defense Directive 5030.17; the designation of instrument landing runways normally associated with airports under AIP agreements; changes in airport operating status from VFR to IFR; and changes to airport traffic patterns.

c. The provisions of Order 7400.2, Part 3, are applicable to all participating offices. Therefore, all Flight Standards and AVN-100 personnel directly involved in airport airspace analysis shall be familiar with Order 7400.2, and those general responsibilities specified in chapter 1, section 2, of this document.

509. AVN-100/AFS INPUTS IN ESTABLISHMENT OF AIRPORTS AND HELIPORTS.

Since the term "airports" includes small isolated airports (including ultralight flight parks), heliports, and large airports, the problems associated with proposed establishment of airports are varied. However, it may be stated that the AVN-100 and AFS studies of all proposed airports or heliports relates mainly to the safety aspects involved, the feasibility of proposed anticipated operations, and the practicality of establishing reasonable instrument approach and VFR flight procedures, where required. Any proposed nonstandard installation or Facility must be thoroughly reviewed to determine if an adequate level of safety can be achieved.

AFS performs the flight safety review of airport proposals to determine whether aircraft operations can be conducted safely considering the proposal's effect on the safety of persons and property on the ground. When requested by the Airports Division, AFS provides an operational safety review for Airports Division approval of a modification of an airport standard. AFS determinations, including studies referred by AVN, will be provided to the OPR.

AVN is responsible for evaluation and comment on all airport proposals related to IFR impact. Routine coordination with the AFS point of contact is expected on joint studies.

a. Questions to be considered in the AVN-100/AFS Analysis. It is not intended that the study be confined to these questions. It is recognized that some proposals will present unique problems which cannot be anticipated. Rather, the questions are outlined here to stimulate thinking (some of them are not applicable to all proposals):

(1) Where is the closest landing area? Is it depicted on aeronautical charts?

(2) What type of activity is contemplated for the proposed landing area? Will a conflict with established instrument approach procedures result? With other airports?

(3) Will existing obstructions result in unrealistic minimums? Unrealistic effective runway lengths? Will existing or proposed man-made and/or natural objects in the vicinity of the airport affect the safety of flight operations?

(4) What is the proximity of the closest city or town? Are runways aligned to avoid populated areas, schools, hospitals, and to minimize noise complaints? Other airports in close proximity?

(5) Are runways aligned in consonance with wind rose data? Is instrument runway aligned with IFR wind rose data?

b. Heliport Establishment. All proposals for the establishment of heliports must be given an on-site operational evaluation as specified in Order 8700.1, Volume 2, chapter 61. Proposed heliports to be located in congested areas, or any rooftop heliport, should be evaluated by helicopter qualified operations inspectors.

c. Study Requirements. It must be recognized that some proposals will be acceptable from an airspace utilization point of view, but may be totally unacceptable from an operational safety standpoint. It is, therefore, important that a thorough study be performed and that AVN-100 and AFS positions be developed and forwarded to the appropriate Airports division/branch. A copy of this position should be forwarded to the other appropriate division or branch. This position should clearly state any operational limitations and restrictions that would be required, e.g., ingress/egress routes.

510. ALTERATIONS OF AIRPORTS OR HELIPORTS.

For the purpose of this order, "alteration" means realignment, activation, or deactivation of any runway layout, and/or associated taxiways, or any other substantial change to the surface of that part of an airport which is used or intended to be used for aircraft landing and taking off. Generally speaking, the contents of the previous paragraphs of this section are also applicable to proposed alterations. However, there is the additional consideration of effects on existing instrument approach procedures previously established for the airport. There is also the possibility of the need for relocation of associated navigation facilities.

511. DEACTIVATION OF AIRPORTS OR HELIPORTS.

For the purpose of this order, "deactivation" means the discontinuance of use of an airport or landing area permanently, or for a temporary period of one year or more. The FAA requires notice of deactivation of airports. However, AVN-100 and AFS have no authority to recommend approval or disapproval of such actions. It may be necessary in some cases to cancel approach procedures, or to recommend the relocation of previously associated airspace. Appropriate NOTAM's should, if required, be published and the closed airports should be marked in accordance with existing standards.

512. ASSISTANCE IN ZONING PROBLEMS.

From time to time, AVN-100 or AFS personnel may receive requests for assistance in the development of airport zoning acts (state) or ordinances (local). Such inquiries should be referred to airports personnel, and in the field to the appropriate airport engineer. It is FAA policy to advocate state and local legislation in the field of airport zoning in accordance with model acts prepared in cooperation with other National agencies, such as the Council of State Governments, the National Association of State Aviation Officials, and the National Institute of Municipal Law Offices. Airports personnel are well versed with the model legislation which has been developed, and have been instructed in the dissemination of the material contained therein.

SECTION 4. CONTROLLED FIRING AREAS

513. DESCRIPTION.

A controlled firing area is an area in which firing of ordnance, lasers, etc., is conducted under controlled conditions so as to eliminate the hazard to aircraft. Activity within such an area will be disseminated as a NOTAM.

514. ESTABLISHMENT OF CONTROLLED FIRING AREAS.

The FAA has the authority for final decision in regard to the establishment of controlled firing areas. However, this is not accomplished through publication of rules, regulations, or orders. Requests for these areas are coordinated and processed by representatives of ATC without rulemaking procedures.

515. PRECAUTIONS.

In controlled firing areas, the responsibility for safety will be entirely with the using organization, which will conduct Its firing so as to eliminate the hazard to aircraft. Generally, the control necessary to assure safety to aircraft is dependent upon the type of activity, terrain, and other factors involved. The precautions required to eliminate the hazard must be determined individually for each activity requested. Minimum required precautionary measures are set forth in Order 7400.2, paragraph 840.

516. AVN-100 REVIEW AND COORDINATION.

a. Considerations. The following facts must be considered in the review and coordination of proposed controlled firing area letters of agreement:

(1) There are no flight restrictions within controlled firing areas.

(2) These areas are not depicted on aeronautical charts.

(3) All pilots are not aware of the locations of these areas.

b. Review. In view of the above, the restrictions and provisions should be carefully reviewed to ensure that all facts have been considered, and that an adequate level of safety will be maintained. The type and volume of IFR traffic are usually well known to ATC personnel. However, the type of local VFR operations is usually best known by Flight Standards personnel.

SECTION 5. RESTRICTED AREAS

517. GENERAL.

A restricted area is airspace designated under 14 CFR Part 73 within which the flight of aircraft, while not wholly prohibited, is subject to restriction. No person may operate an aircraft within a restricted area between the designated altitudes and during the time of designation without the permission of the using or controlling agency.

Obstacle Clearance. Restricted areas as such are not considered obstacles to the establishment of instrument flight procedures. However, obstacle clearance shall be provided over terrain and/or man-made obstacles within the restricted area which underlies the flight procedure clearance area.

518. LETTER OF PROCEDURES.

A letter of procedures between the using agency of a joint-use restricted area and the ATC facility (controlling agency) may be promulgated to allow nonparticipating aircraft to transit the restricted area when the area is not being used for its designated purpose.

519. RESERVED.

SECTION 6. ESTABLISHMENT, RELOCATION, OR DISCONTINUANCE OF RADIO NAVIGATION AIDS

520. CRITERIA AND GUIDELINES.

The criteria and guidelines for the establishment, relocation, or discontinuance of navigational aids affecting airspace are contained in Order 7031.2, Airway Planning Standard Number One Terminal Air Navigation Facilities and ATC Services.

521. AVN-100 ACTION.

Conduct studies to determine the effect of the proposed action on existing or proposed IFR flight operations. Forward the results of these studies and an AVN-100 position to the appropriate AT division/ branch.

522. AFS ACTION.

Conduct studies to determine the effect of the proposed action on operational safety as relates to existing or proposed visual flight operations. AFS will provide input to the appropriate AT division/branch relating to operational impact, and to other interested divisions on request.

523-599. RESERVED.

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CHAPTER 6. MILITARY PROCEDURES

600. GENERAL.

FAA Order 8260.3, United States Standard for Terminal Instrument Procedures (TERPS), specifies that the U.S. Navy, Air Force, and Coast Guard are responsible for the establishment and approval of instrument procedures as well as the review and approval of radar MVA charts for airports under their respective jurisdiction. This responsibility also applies to the approval of deviations from standards.

a. U.S. Army procedural requirements shall be processed in accordance with Order 8260.15, U.S. Army Terminal Instrument Procedures Service.

b. U.S. Air Force procedural requirements shall be processed in accordance with Order 8360.32, U.S. Air Force Terminal Instrument Procedures Service.

c. Questions concerning U.S. Navy procedures shall be directed to the Naval Flight Information Group (NAVFIG); Washington Navy Yard; 1339 Patterson Ave., SE, Room 301; Washington, DC 20374-5088. Phone: (202) 433-3473.

601. REVIEW AND COORDINATION.

a. Military Procedures. Military instrument procedures are reviewed and coordinated in accordance with applicable military directives prior to submission for flight inspection. Review of the procedure to determine compliance with Order 8260.3 criteria or other approved 8260 series orders (except as noted in paragraph 600) is NOT an FAA responsibility. AVN-200 shall forward flight inspection comments regarding procedure design, flyability, etc., to the attention of the authority submitting the procedure(s).

b. Military Fixes. Military fixes are maintained in the National Data Base, accessed by FAA air traffic system computers for radar display, and used to develop aeronautical charts and avionics data bases. Therefore, it is imperative that the requirement to document and name fixes supporting military operations/procedures receive the same priority as Forms 8260-2 that support civil procedures. AVN-100 shall review submitted forms for accuracy, forward them for flight inspection, and process the forms as specified in Chapter 9.

602. FAA ACCEPTANCE.

FAA accepts military procedures for civil use unless the note **"Not for Civil Use"** is annotated on the procedure by the military.

603. ASSISTANCE.

Where a military command requests technical assistance concerning instrument procedure design, criteria, completion of FAA forms, or in determining an equivalent level of safety related to a waiver, AVN-100 shall honor the request commensurate with present workload.

604-699. RESERVED.

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CHAPTER 7. PLANNING

SECTION 1. GENERAL

700. GENERAL.

a. The development of effective and efficient flight procedures is closely related to the facility establishment and airport programs, and requires active participation by Flight Standards and AVN-100's regional personnel in the planning, programming, and budgeting of navigation facilities and airport development plans. Instrument procedures often determine the alignment and location of navigation facilities as well as the location, marking, and lighting of airport landing and maneuvering areas.

b. The allocation of funds frequently depends on the determination that efficient procedures can be developed and can be justified on the basis of operational benefits (landing minimums) or safety improvements. Therefore, the operational planning associated with facility installations and airport development, particularly in large terminal areas, is one of the most important responsibilities of the Flight Standards, Flight Procedures, and Airspace Program.

SECTION 2. PLANNING STANDARDS

701. PLANNING STANDARDS.

a. Facility Establishment. Airway Planning Standards contain the criteria for the establishment of air navigation facilities. These criteria are based, in part, on air traffic demand since the volume of traffic provides a measurable indication of the need for air navigation facilities and other aeronautical services.

b. Standards Limitations. Airway Planning Standards do not, however, cover all situations which may arise and are not to be used as a sole determination in denying a service where there is a demonstrated operational or ATC requirement. An aeronautical requirement may exist for facilities that cannot be adequately measured by a consideration of air traffic demand alone. Similarly, air traffic demand does not in itself always constitute a requirement for an air navigation facility. These situations must be individually evaluated to determine whether the benefits to be gained are commensurate with the cost of the facility or service.

c. Benefit/cost ratios have been established by the office of Aviation Policy and Plans (APO). Phase I deals with determining the traffic activity using Airway Planning Standard Number One (APS-1). Phase II criteria are a comparison of the present value quantitative benefits of installing an air navigation facility, with the present value of the costs for establishing the aid. Phase II includes other factors such as weather, etc**.** In most instances, the establishment criteria, in addition to the traffic volume, require an operational improvement in the form of lower altitudes or reduced visibilities with respect to IFR operations or a safety benefit with respect to visual aids which are required to resolve known safety problems.

d. Responsibility. The primary responsibility for determining that a location meets the air traffic volume requirements rests with Air Traffic System Requirements Service (ARS-1). At the regional level, the responsibility for identifying improvements to operational minimums or for establishing safety requirements is jointly shared by AVN-100 and Flight Standards Service (AFS-1). Specific areas of responsibility are delineated in Chapter 1. However, each organization has unique skills and expertise which must, in many situations, be combined in a teamwork approach in the area of airport and navigational facility planning. AVN-100 personnel serve in a team leadership role for the region in developing and recommending improvements to IFR procedures, operational minimums, and associated facilities.

702. DETERMINATION OF OPERATIONAL BENEFITS/ IMPROVEMENTS.

a. General. An operational benefit/improvement is considered to exist:

(1) When IFR operations can be authorized where none existed previously;

(2) Where a reduction of IFR minimums on existing procedures can be achieved;

(3) Where an additional NAVAID will provide lower minimums than those authorized on existing adjacent facilities; or

(4) Where a reduction in minimums cannot be achieved, an improvement in operational safety can be demonstrated.

b. Criteria. A reduction of at least 100′ in descent altitude or a reduction of 1/4 mile in visibility requirements should be indicated to adequately support an operational benefit. Where a reduction of less than 100′ in descent altitude is anticipated, additional justification should be provided to show that other improvements in the overall operation can be achieved with the additional facilities. Such improvements might include simplification of operating procedures; reduction of flight time; improved course guidance; improved runway alignment; or elimination of criteria waiver, etc. Flight Standards and AVN-100 personnel are expected to provide this type of supporting information during the planning phases for new NAVAID's.

c. Determination. A final determination that the anticipated benefits can actually be achieved is necessarily dependent upon the demonstrated performance of the facility at the time of commissioning; however a reasonable evaluation can be made for planning purposes based on the best information available at the time.

SECTION 3. SAFETY ANALYSIS

703. PERFORMING A SAFETY ANALYSIS.

a. The Airway Planning Standards consider the programming of precision approach path indicator (PAPI) and runway end identifier lights (REIL) as visual aids provided the runway meets a minimum number of landings and a reasonable safety benefit versus cost can be established. Although not specifically considered in the planning standards for VFR use, an economy approach light system may be considered to resolve a safety problem where the cost of the system is commensurate with the improvement desired, and the REIL or PAPI will not provide the necessary service.

b. In those cases where visual aids are considered essential to operational safety and the runway does not meet the traffic volume requirement, additional justification should be developed highlighting the visual deficiencies as they exist and the improvements that will be achieved. AVN-100 personnel will recommend to, or assist, the Airports and Airways Facilities Divisions in developing the principal justification for programming visual aids at IFR airports.

c. Flight Standards regional and field personnel will provide input to the regional planning teams through the All Weather Operations (AWO) Program Manager for visual aids to correct deficiencies identified during their flight program activity, contact with the public, or during incident/accident investigations. Flight Standards will provide primary support for the planning of visual aids for safety improvements at VFR public use airports. The AWO/PM will review all division inputs for appropriateness and develop recommendations for the regional airports and facilities planning groups.

d. Determining visual aids safety benefits. Orders 7031.2, Airway Planning Standard Number One Terminal Air Navigation Facilities and ATC Services, and 7400.2, Procedures for Handling Airspace Matters, provide FAA personnel with the basic guidance for establishment and justification.

(1) There are a number of operational and environmental situations where visual reference deficiencies exist, and where improvements can be made by the installation of a visual aid system to enhance safety. Typical deficiencies include:

(a) Deceptive Approach Area. A situation in which the topography, landmarks, or lights underlying the approach path do not provide the pilot with an adequate visual reference plane on which to establish a proper approach to a runway. This includes open water, featureless terrain, dense tree growth, deceptive lights, or rapidly rising or falling terrain which presents an unbroken or indefinite surface lacking the contrast for depth perception and glide angle maintenance.

(b) Obstruction Clearance. A situation in which natural or manmade obstructions under, or penetrating, the approach surface makes pilot judgment of obstruction clearance difficult due to their orientation, irregular pattern, or obscurity due to inability to provide appropriate marking or lighting.

(**c) Runway Identification.** A situation in which environment surrounding an airport derogates the pilot's ability to instantaneously establish and maintain runway identification at 2 miles or less from the runway threshold within 90° of the runway centerline extended. Identification may be hampered by one of the following conditions:

1. Overriding Lights. A general preponderance of metropolitan or area lighting located within 2 miles of the circling approach area to the runway.

2. False Lights. A configuration of non-aviation lighting, underlying the approach surface, which presents to the pilot a false runway identification such as a well-lighted boulevard, expressway, or railroad yard which crosses the approach area at 45° or less to the runway centerline extended.

(d) Runway Alignment. A situation in which the runway lighting fails to provide alignment information sufficiently in advance to assure correct intercept of the extended runway centerline and subsequent approach. This situation may be divided into two types:

1. Intercept Guidance. Where straight-in visual approach to the runway is at an angle of 15° or more to the runway centerline extended and the line of sight to the runway lights is obstructed.

2. Circling Guidance. Where, due to terrain or technical considerations, the primary approach is aligned mainly downwind and the subsequent circling to the upwind requires positive alignment reference to preclude overrunning the runway centerline extended.

(e) Nonprecision Straight-in Approach. A runway to which a nonprecision straight-in approach has been authorized. Vertical guidance is necessary for stabilized descent from the MDA to the runway. The vertical guidance assists the pilot in maintaining a safe flightpath to the runway, thus avoiding premature descent which may result in landing short of the runway during weather visibility conditions at or near the authorized straight-in minimums.

e. Flight Standards and AVN-100 personnel will frequently be involved in airport planning studies in their respective areas of responsibility, which require analysis of the merit of adding various visual aids. In addition to the specialist's experience or input from other knowledgeable persons, the following should be considered in recommending a particular visual aid:

VISUAL AIDS USAGE TABLE

Operational Problem	PAPI/VASI	REIL	MALS	LDIN
Deceptive Approach Area	Very Effective	Ineffective	Effective	Very Effective
Obstruction Clearance	Very Effective	Ineffective	Ineffective	Limited Effectiveness
Runway Identification	Limited Effectiveness	Effective	Effective	Very Effective
Runway Alignment	Ineffective	Limited Effectiveness	Very Effective	Very Effective
Vertical Guidance	Very Effective	Ineffective	Ineffective	Ineffective
Turbojet Operations	Very Effective	Ineffective	Limited Effectiveness	Effective
Circling Guidance	Ineffective	Limited Effectiveness	Limited Effectiveness	Very Effective

NOTE: Omni-directional REIL may be considered for improving guidance to a circling runway if the unbaffled lights would not create a greater problem for operations on other runways.

SECTION 4. AIRWAY PLANNING

704. GENERAL.

a. The primary responsibility for the establishment, amendment, or deletion of airways/jet routes rests with Air Traffic Service based on air traffic demand and user requirements. AVN-100, both at the national and regional level, shall participate in airway planning with respect to navigational signal coverage over designated routes, development of MEA's and related data, and the siting of electronic facilities. Frequently terrain factors or site availability dictate the siting of an electronic facility; however, there are instances where the en route facility can be located so as to provide a terminal instrument approach capability in addition to the en route service.

b. AVN-100 should be cognizant of operational requirements and environmental conditions in the en route and terminal areas that need to be considered in order to develop sound recommendations for optimum facility siting. Situations will arise where AVN-100 considers that a change in airway planning is necessary or desirable. Such changes could result from facility restrictions, lack of facility coverage, need for lower MEA's, improve-ment in airway alignment, and elimination of criteria waivers, etc. Every effort should be made to develop recommendations in coordination with appropriate airway facilities and ATC so that full consideration of local problems will be reflected in regional planning.

SECTION 5. TERMINAL PLANNING

705. GENERAL.

a. Responsibility. The primary responsibility for identifying airport locations that qualify for new terminal navigational facilities (except radar) rests with AVN-100. AVN-100 is required to participate in terminal planning with respect to the type of facilities required for the intended operations, development of instrument procedures, operational minimums, and the establishment of priorities for procurement and installation of planned facilities. AVN-100 regional personnel should be cognizant of operational requirements and environmental conditions in the terminal areas that need to be considered in order to develop sound recommendations for facility selection and optimum facility siting. The AWO/PM will provide technical assistance to regional planning teams developing low weather (Category II/III) facilities, applying emerging technologies, or requiring expertise in determining if a waiver to a flight procedure is practical.

b. Planning Recommendations. AVN-100 regional personnel should identify potential improvements to IFR terminal operations to appropriate Air Traffic and Airports Division planners. Such recommended improvements could occur as a result of new facility restrictions, changes in airport operations, the need for improved instrument procedures, safety considerations, and elimination of criteria waivers.

706. REQUIREMENTS FOR OUTER COMPASS LOCATORS FOR NEW ILS INSTALLATIONS.

In achieving the goals of reducing the total establishment costs for instrument landing systems, emphasis has been placed on providing only those components and services which are essential to the basic operational need. In this respect, the compass locator has not been considered a required item for many new ILS locations and will be included as a component only where it is properly justified. This criteria specifies conditions that must be considered to properly justify the installation of compass locators in conjunction with new ILS facilities. The term "**transition**" is used for convenience throughout this section in lieu of feeder route and initial approach segment associated with instrument approach procedure construction.

a. General Criteria.

(1) Compass locators are not required at locations where satisfactory transitions can be established to the LOC course from supporting NAVAID's unless holding at the compass locator is required.

(2) Compass locators are not required in an airport surveillance radar (ASR) environment where radar service can be provided on a continuous basis. Where radar service is utilized for transitioning to the ILS, vectors to a point within the normal ILS clearance area are required to eliminate the procedure turn (NoPT). This does not impose a radar fixing requirement as a condition for executing the approach procedure.

(3) An outer marker (OM) by itself shall not be utilized to identify the point from which holding or procedure turn is to be executed (see paragraph 214).

(4) A procedure turn may be authorized from an intersection that overlies the OM or is established outside of the OM location. For planning purposes, the accuracy of the intersection should not exceed plus or minus one mile.

(5) Transitions shall not be established from outside of the normal clearance and buffer areas unless they have been flight checked and the minimum localizer clearance requirements are met. Where such a flight check is unsuccessful, an intersection must be established on the localizer course, or a lead-radial established within localizer coverage. When established on the localizer course, the transition route from a VOR or NDB must be predicated on a NAVAID or fix which does not utilize the localizer; i.e., the fix must stand alone on a localizer course for definition (see paragraph 905d(2) and figure 7-4. TERPS paragraphs 287a and 1761 apply.

(6) Transitions to the LOC course which permit a straight-in approach (NoPT) will be established in accordance with criteria for localizer intercept angles and length of intermediate segment described in TERPS paragraph 922 and depicted in figure 7-3. Although criteria permit localizer intercept of 15^{o} at one mile from the OM, it is

recommended that all intercepts be established no less than 3 miles nor more than 10 miles from the OM. In no case, will a straight-in approach be authorized from a transition that proceeds from a facility/fix directly to an OM or compass locator at outer marker (LOM) unless the facility/fix is established on the localizer course.

b. Satisfactory Transitions. The standard for localizer usable distance/coverage is 18 miles within $\pm 10^{o}$ of the localizer course, and 10 miles for that area between 10^{o} and 35^{o} either side of the course. In determining the need for a compass locator, facility performance data may not be available for the development of transitions. Figures 7-1, 7-2, 7-3, and 7-4 depict normal clearance areas with a 2-mile buffer area established around the perimeter. These figures will be used for determining the need for a compass locator during initial facility planning and for the development of original procedures when flight check data is not available. The following general guidelines will apply:

(1) When a VOR or NDB fix exists within the shaded area shown in figure 7-1, transitions may be established to a fix on the localizer course from which a procedure turn can be executed.

(2) When a VOR or NDB is located within the shaded area shown in figure 7-2 and a fix can be established at the OM location in accordance with paragraph 706a(4), a transition may be established to the fix from which a procedure turn can be executed.

(3) When a VOR, NDB, or satisfactory fix exists or can be established within the shaded area shown in figure 7-3, a transition may be established to the localizer course and a procedure turn is not required.

(4) Criteria for fix accuracy is contained in TERPS paragraph 287a. Minimum divergence angle for PT fix is 45°.

c. Locations that Qualify for a Compass Locator. In determining the need for a compass locator, the local traffic flow, location of supporting facilities, and local terrain features must be considered. A compass locator may be planned for new ILS installations where one or more of the following conditions exist:

(1) In a non-radar environment where a transition cannot be established in accordance with paragraph 706b.

(2) In a non-radar environment where satisfactory transitions can be established in accordance with paragraph 706b, but the flow of traffic is such that operational requirements cannot be satisfied and the lack of a compass locator would result in an unacceptable delay to arriving aircraft.

(3) In a radar environment where radar service cannot be provided on a continuous basis or where radar service will result in a prohibitive controller workload or would require additional positions and personnel to provide the radar service.

(4) In an area of precipitous or unusual terrain where special procedural design is required.

d. Approach Procedure Design. To the extent possible, ILS approach procedures shall be designed to eliminate the compass locator as a required facility for the execution of the approach. Transitions shall be established in accordance with the following:

(1) Original Procedures. In designing original procedures prior to ILS commissioning, transitions shall be limited to those which can be established in accordance with the general guidelines contained in paragraph 706b unless a compass locator is programmed.

(2) Revised Procedures. Following facility commissioning, additional transitions originating outside of the normal clearance and buffer areas may be established if they are found to be satisfactory through flight inspection evaluation.

(3) Use of DME. The use of DME to provide arc transitions or to provide additional means of identifying fixes can provide flexibility for users that are DME equipped. However, DME arc initial segments are not encouraged for reasons stated in paragraph 807g(4). DME fixes established where an arc transition intersects the ILS course shall be named. If DME is the only means of providing transitions or fixes, a compass locator should be provided.

e. Action. AVN-100 regional personnel should make a map study at all planned or programmed ILS locations to determine if a compass locator is required. Priority should be given to approved ILS projects. Following this determination, all requirements for locators shall be included in the F&E budget or submitted as a reprogramming action. Justification for each locator shall be provided by AVN-100 by including an appropriate statement for each location as follows:

(1) Non-radar location - conforms to Order 8260.19, paragraphs 706c(1) and (2).

(2) Radar location - conforms to Order 8260.19, paragraph 706c(3).

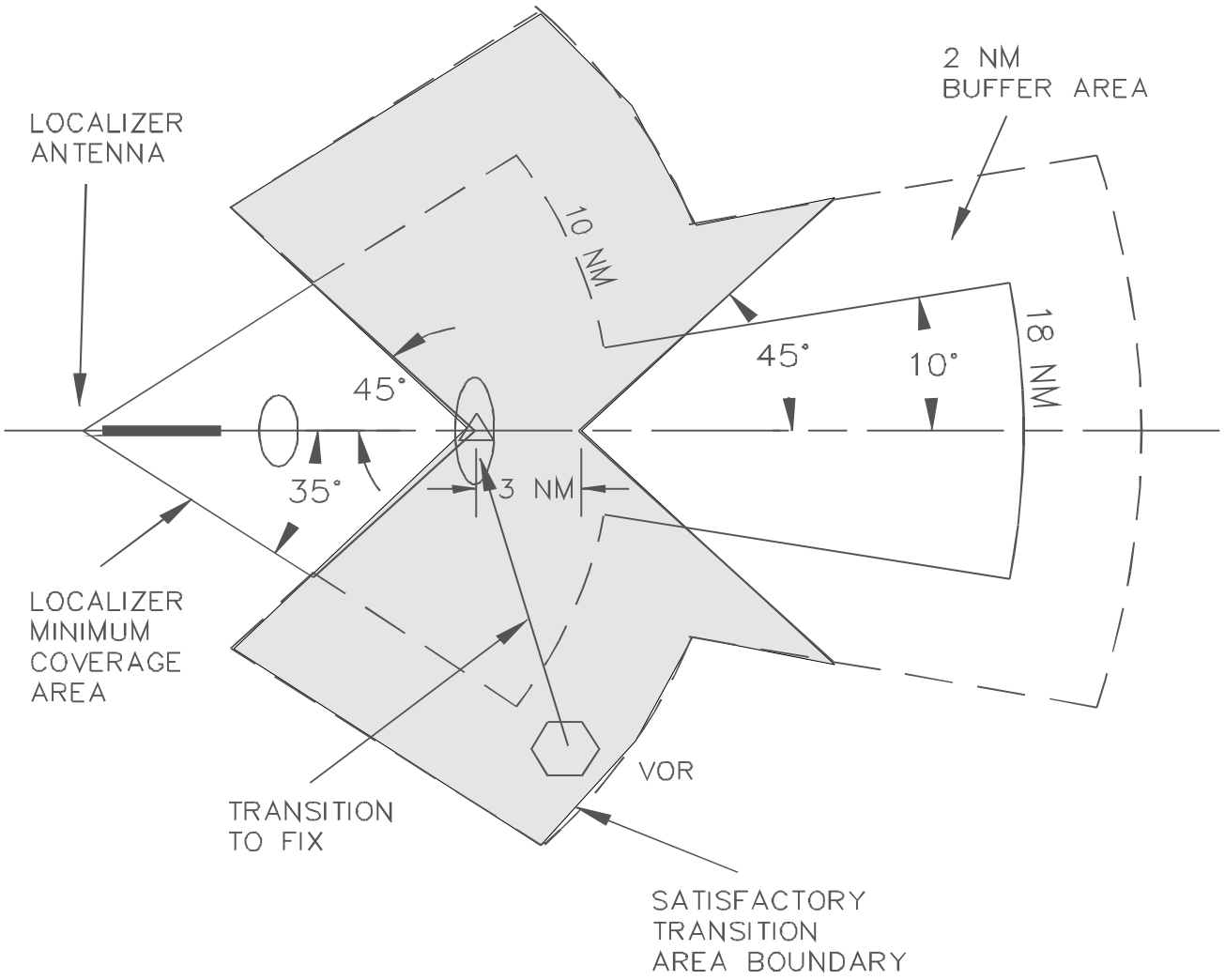

Figure 7-1. TRANSITION TO LOCALIZER FIX FOR PT

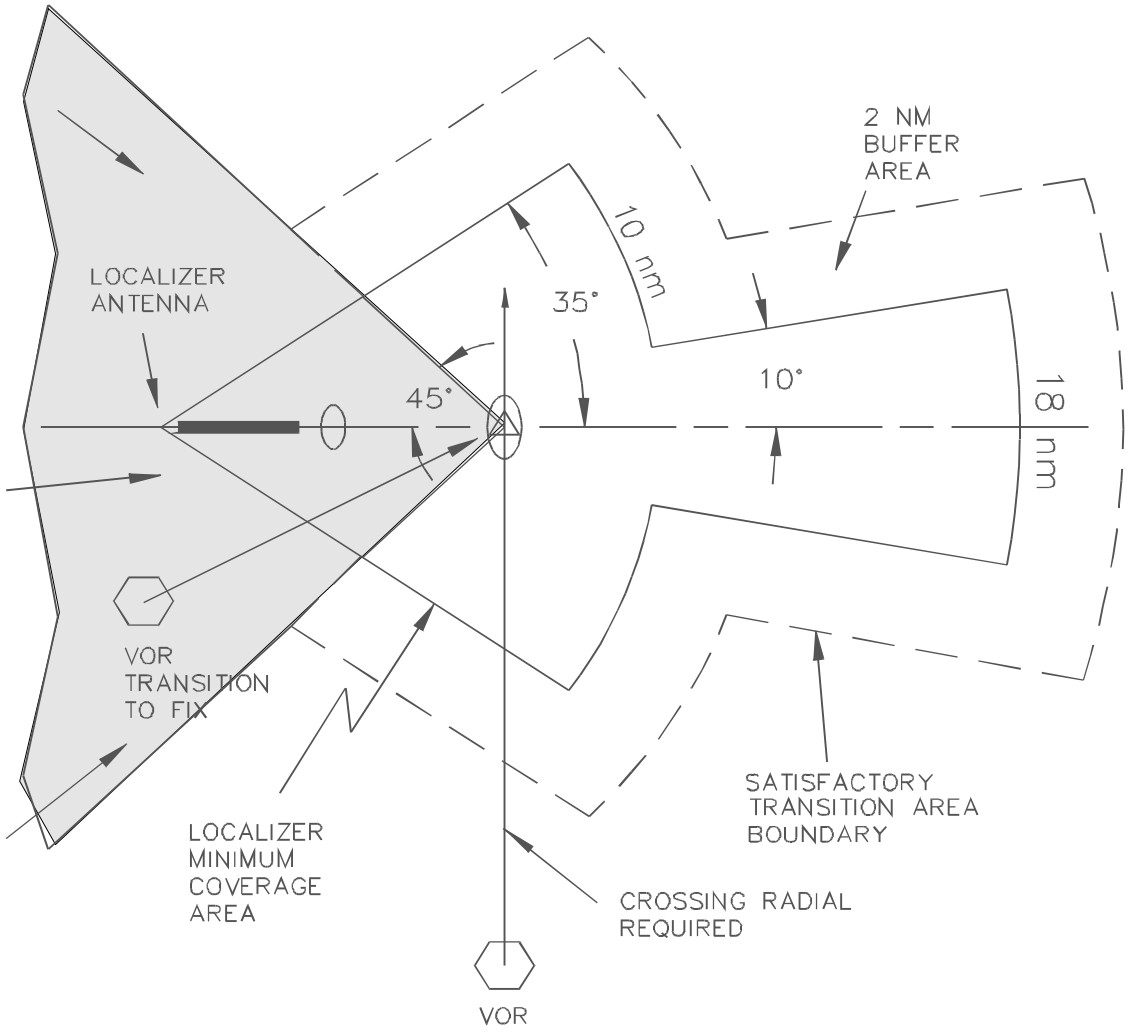

Figure 7-2. TRANSITION TO OM FOR PT

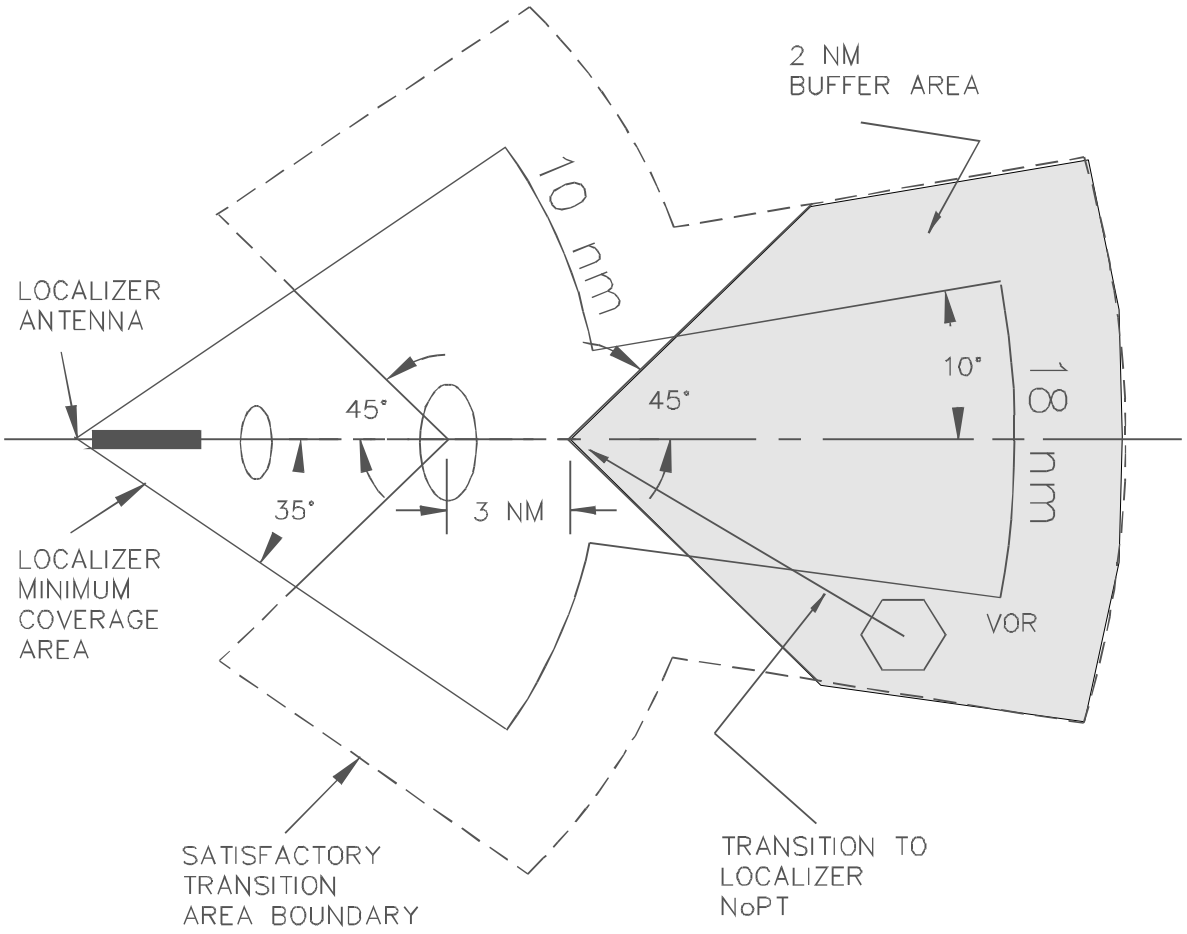

Figure 7-3. TRANSITION TO LOC COURSE (NoPT)

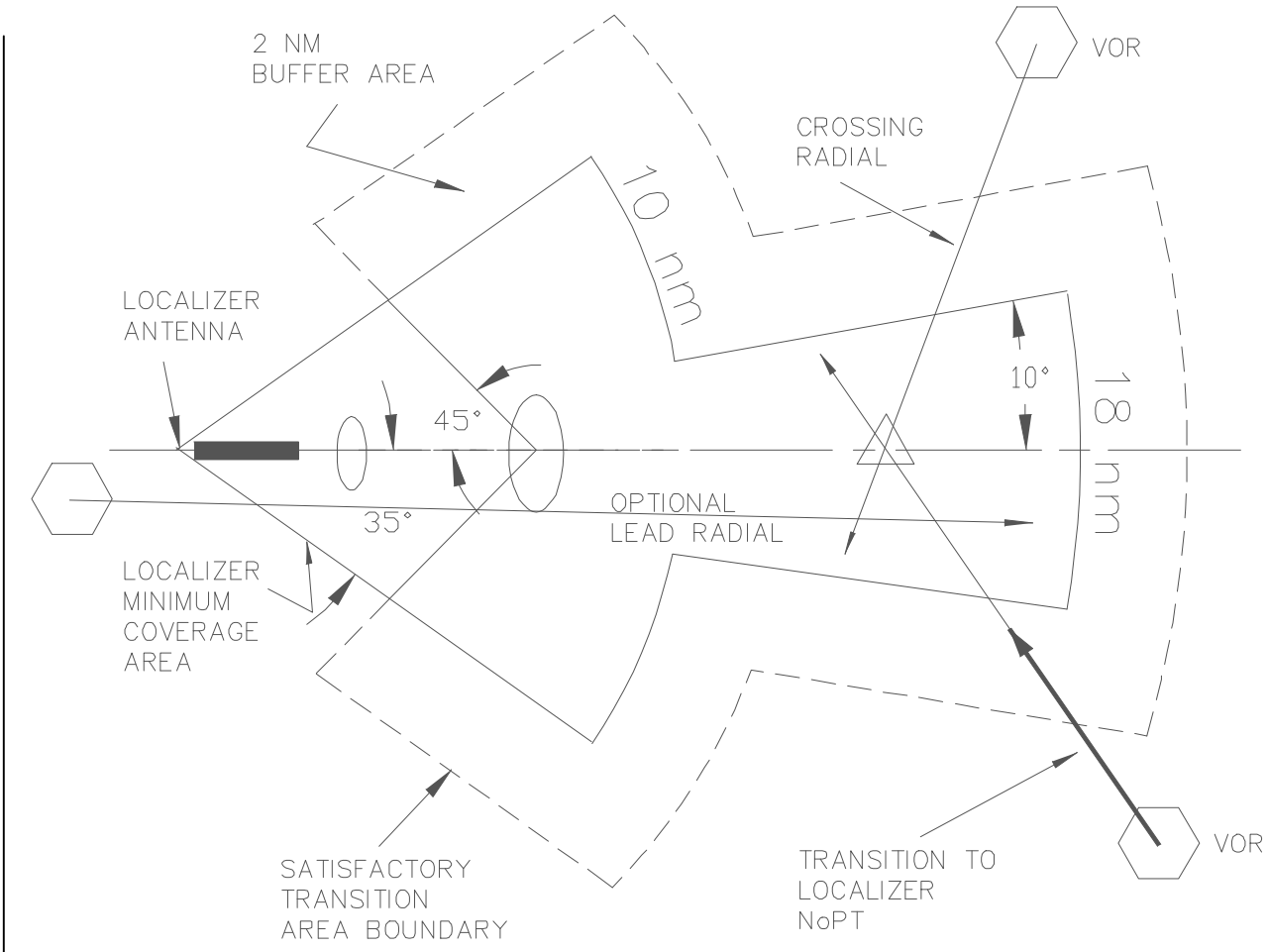

Figure 7-4. STAND-ALONE FIX ON LOC COURSE

SECTION 6. AIRPORT PLANNING

707. GENERAL.

a. Familiarity. Since runway location, configuration, and alignment with respect to associated navigation facilities determine the IFR capability of an airport, AVN-100 regional personnel should be thoroughly familiar with all airports existing or planned in their areas of responsibility. AVN-100 specialists should have access to all available material relative to airport planning and development and be familiar with the AIP projects for which they are responsible. The AWO/PM will participate as an ad hoc team member for airport planning issues at IFR airports desiring improved low weather operations, or where safety issues dictate Flight Standards involvement.

b. Airport Master Plans or amendments coordinated by the Airports Division, should be routed through regional Flight Standards Divisions and AVN-100 regional personnel for review and comment. AVN-100 should develop necessary coordination procedures with Airports Division personnel.

SECTION 7. PRIVATE AID

708. GENERAL.

a. Informal Discussions. Regional Flight Standards and regional AVN-100 personnel will frequently be called upon by municipalities, private interests, or other government agencies for recommendations relative to the location and type of instrument approach facilities most practicable. This type of cooperation is encouraged. However, it should be made clear that informal discussions with sponsors of private facilities (non-Federal) are advisory in nature and do not necessarily represent the FAA's official position nor commit it to a particular course of action. AVN personnel should be familiar with the guidance in Order 6700.20, Non-Federal Navigational Aids and Air Traffic Control Facilities, regarding establishment of non-Federal NAVAID's.

b. Proposal Process. Before private facilities can be installed and operated for private or public IFR procedural use, the proposal must be processed for airspace analysis and frequency allocation study. Also, agreements for the inspection and acceptance must be drawn in accordance with 14 CFR Part 171 or other applicable Administration directives. Requests received for establishment of non-Federal electronic air navigational aid facilities shall be forwarded to the appropriate regional AF division for initial processing. See Order 6700.20, paragraph 13.

c. Sponsor Advice. Occasions will arise where a sponsor will seek advice concerning the use of a new type of navigational facility or a type that is not approved for use by the FAA. In these situations, regional Flight Standards and FPO personnel shall make no commitment with respect to the acceptability, installation, or procedural use of such facilities. Refer inquiries of this nature to the Washington Program Office for information and advice concerning appropriate handling of such matters. Sponsors of private facilities should be advised to direct formal requests or inquiries, relating to the approval and use of private facilities, to the appropriate regional Airways Facilities office for necessary review and processing. Contact Flight Standards, AFS-400, for advice regarding the impact of new/emerging technologies on the facility proposal.

SECTION 8. FACILITIES AND EQUIPMENT (F&E) SUPPORT

709. SUPPORT.

a. At the regional level, the responsibility for identifying improvements to operational minimums or for establishing safety requirements is jointly shared by AVN-100 and the respective regional Flight Standards Division (FSD). Chapter 1, section 2, Responsibilities, of this order specifies primary responsibilities of each organization. Additionally, each organization has unique skills and expertise which, in many situations, can be combined in a teamwork approach in the area of airport and navigational facility planning. AVN-100 personnel serve in a team leadership role for the region in developing and recommending improvements to IFR procedures, operational minimums, and associated facilities.

b. It is expected that a regional AVN/AFS team approach will provide a method for regional Flight Standards input on behalf of system users and operators which addresses operation and safety concerns.

c. The FSD also submits written justification for visual aids (not associated with IFR airports) and provides technical advice for IFR studies or recommendations which may not meet established standards; e.g., require AFS approval for waiver or NCP. Each team should establish a means of submitting its respective organization's input to the regional F & E budget.

710.-799. RESERVED.

minimums are not authorized). Identification of the LOC MAP will ensure the publication of a time/distance table on the associated approach chart. Specify distances to the nearest hundredth of a mile.

(1) FAA Form 8260-3. For the precision portion of the ILS procedure, the MAP is pre-printed on the form as: "ILS: at the DH." Designate the LOC and/or circling MAP as a specific distance in hundredths of a mile after a specified fix or facility or at a specified fix or facility. When LOC-only minimums are NOT authorized, the descent must be made on GS to circling MDA (see paragraph 813m(6)(e)); change the preprinted term "LOC" to Circling." If DME is available, establish a DME fix in hundredths of a mile for the nonprecision MAP.

(2) FAA Forms 8260-4/5/7. In the box, titled "MAP," identify the missed approach point as "a distance after (or at) a specified fix or facility" as appropriate. Establish a DME fix in hundredths of a mile if DME is available.

d. RNAV. Do NOT list coordinates for LORAN, nor radial/DME for VOR/DME RNAV. Enter the name of the MAP WP or the ATD from the Runway WP as follows:

BONLI WP; or 1 ATD from RUNEY WP.

e. Missed Approach Instructions. Where possible, develop missed approach procedures (except radar) using the same type of navigation guidance utilized for the final approach segment.

NOTE: When using the word "direct" in the missed approach instructions, ensure that all categories of aircraft are evaluated; i.e., CAT A is not encompassed in CAT D missed approach area and vice versa.

Normally, a missed approach course/heading should be specified. If no course/heading is specified, the aircraft is expected to maintain the last established course/heading. Do NOT use the terminology "Climb runway heading" or "Climb straight ahead;" e.g., use "Climb to 2,800 …"

(1) Where the missed approach course differs from the final course: "Climb to 2,800 via ABC R-180 to ABC VORTAC and hold."

(2) When the missed approach point is also the missed approach holding fix and straight-ahead climb is not practical: "Climbing right turn to 2500 in ABC VOR holding pattern." In some cases, a straight-ahead climb or climb via a specified course/heading to an altitude, prior to returning to the holding fix, may be necessary for aircraft with larger turning radii. When this occurs, use the terminology in paragraph 815c(3).

(3) When obstacles in a turning missed approach area require an initial straight-ahead climb: "Climb to 3,100 then climbing left turn to 4,000 direct ABC VOR and hold."

(4) When obstacles preclude a straight-ahead climb and require an immediate turn: "Climbing right turn to 4,000 direct ABC VOR" or "Climbing right turn to 4,000 via heading 070 then direct ABC VOR and hold."

(5) ILS/MLS and LOC/AZ missed approach procedures requiring a turn of more than 15° shall specify an altitude that is at least 400′ above the TDZE prior to commencing a turn. Round the resulting altitude to the next higher 100′ increment: "Climb to 1,200 then climbing left turn to 3,100 via heading 070 and ABC R-167 to ABC VOR and hold." See also paragraph 815b for rounding guidance.

(6) If the procedure serves VOR as well as TACAN equipped aircraft, address TACAN requirements also: "Climb to 5,500 via ABC R-111 then climbing right turn to 6,000 direct ABC VORTAC and hold (TACAN aircraft continue via ABC R-280 to CAROL 10 DME and hold W, LT, 100 inbound)."

(7) LOC courses are specified in compass points, and NDB courses as bearings to or from: "Climb to 3,000 via I-ABC NE course and 350 bearing to DEF NDB and hold."

(8) When the missed approach requires no specific direction of turn: "Climb 7,000 via ABC R-197 then direct ABC VOR and hold."

(9) RNAV missed approach routing may be via courses or direct.

Examples: **"Climb to 5000 via 080 course to SANDY WP and hold;" or "Climbing left turn to 5,000 direct CHERL WP and hold."**

f. Missed Approach Holding. When holding is specified as part of the missed approach instructions, include holding details under Additional Flight Data. Holding is not specified when missed approach is to the FAF or IF used in holding in lieu of PT. Holding is not specified when the missed approach is to an en route fix at an altitude sufficient to permit holding and en route flight. In the latter case, ensure that holding on the missed approach course that leads to the fix is satisfactory.

g. Alternate Missed Approach. Alternate missed approach may be established when required by ATC. Alternate missed approach procedures shall not be charted. When authorized, they shall be preceded by the words: **"…or when directed by ATC."** If holding is authorized on the alternate missed approach, include holding details immediately following the alternate missed approach instructions. Alternate missed approaches should be discouraged in a radar environment. When temporary NAVAID outages (planned or unplanned) prohibit the use of the primary missed approach for a procedure, AVN-100 has the responsibility to ensure an IFR missed approach procedure is published, either on the chart or by NOTAM in the event of lost communications. This does not preclude Air Traffic from issuing alternate climb out instructions.

816. ADDITIONAL FLIGHT DATA.

When additional information or data is essential to clarify the charting of a procedure or when the procedures specialist wants information charted, but does not want it to appear on the chart as a note, the necessary information/data shall be entered in the Additional Flight Data section. Specific instructions to chart data shall be held to a minimum. (See also paragraphs 805b and 815f.)

a. If sufficient space is not available on the form for all necessary data, it may be continued in the NOTES section or on Form 8260-10. When necessary to use Form 8260-10, state: **"Continued on page 2."**

b. Visual aids and runway information once printed on the approach chart may be omitted from the additional flight data section on future amendments. Other items such as holding information, restricted area data, final approach course alignment, etc. shall be retained when amending a procedure.

c. Holding. When primary missed approach instructions provide for holding, enter Additional Flight Data as follows: **"Hold SE, RT, 313.08 inbound."**

d. The nonprecision controlling obstacle in the primary and/or secondary area of the FAS shall be shown as the FAS Obstacle. In the event a stepdown fix is used in the final approach segment, the controlling obstacle between the stepdown fix and the runway shall be shown as the FAS obstacle. Designate the obstacle location to the nearest second. Use standard Note: **"FAS Obst: 317 Tower 364227/891523."**

e. To identify certain significant obstacles in or near the instrument approach area, include locations and heights under additional flight data. If, in the opinion of the procedures specialist, these obstacles could be **critical to flight safety**, they should be prefaced by the word **"**C**hart."** However, if the data is being furnished only as information, it shall NOT be prefaced by the word "Chart." Charting agencies will chart any item marked "Chart." Any item listed without indicating "CHART" will be reviewed by the charting agencies and will be charted if it meets their charting specifications. Use standard Note: **"Chart 2674 Antenna 372219/941657"** or **"2674 Antenna 372219/941657."**

f. Obstacles close to a final approach or stepdown fix considered under TERPS paragraph 289, shall be handled as follows:

(**1) When paragraph 289** is applied to multiple obstacles, document only the highest obstacle in the 7:1 area.

(2) List the obstacle under Additional Flight Data as **"374 Antenna 352416/881253."** It shall NOT be identified as a "paragraph 289 obstacle." The following entry shall also be made in the Remarks section of Form 8260-9: **"TERPS paragraph 289 applied to 374 antenna 352416/ 881253."**

NOTE: *Do NOT document takeoff obstacles on Form 8260-9 or in Additional Flight Data.*

g. Installed visual aids must be correctly shown on the aerodrome sketch.

(1) On initial procedures for a new IFR airport, enter all approved lighting aids at the airport which could assist the pilot conducting the approach, such as runway lights, approach lights, **VASI, REIL**, etc.**: "HIRL RWY 18-36, MIRL RWY 3-21, VASI RWY 36, REIL RWY 21."** Do NOT identify unlighted runways.

(2) If the present AL chart has **incomplete or incorrect aerodrome data**, **or new facilities are added** which are the reason for the amendment, use standard Note: **"Chart HIRL RWY 9-27 vice MIRL;" VASI RWY's 24, 35;" "Chart MALSR RWY 18 vice MALSF."** If facilities affecting the SIAP are removed, use standard Note: **"Delete MALSR RWY 36."**

h. Specify final approach course alignment if OTHER than the following:

(1) For straight-in approaches, runway centerline at threshold, as follows:

"FAC crosses RWY C/L extended 3180 from THLD;" or FAC 450L of RWY C/L extended 3000 from THLD." (Left or right as used in the latter case is as viewed by the pilot.)

(2) For circling approaches, to the on-airport facility, or to the Airport Reference Point if the facility is off-airport, as follows:

"FAC crosses intersection of RWY's 9-27 and 18-36."

i. When a flight check radial is used for the final approach course instead of the plotted radial, use the following Note: **"FAC is a flight check value."** See also paragraph 811c(1)(c).

j. When a procedure maneuvering area encompasses a Warning, Restricted, or Prohibited Area, use the following Note: **"Chart R-2567."**

k. When simultaneous approaches are authorized, each approach shall include a note requiring the depiction of the adjacent localizer. Use standard Note: **"Depict LOC RWY 27R."**

l. RNAV Glide Slope.

(1) When an RNAV procedure requires specific data to use glide slope equipment, use standard Notes:

"Glide slope computer setting 3.08°."
"Horizontal distance MDA to MAP on GS 2.71°."
"Reference facility elevation XYZ VORTAC 1160." (VOR/DME RNAV only).
"RW16L Elevation 774.03" (When MAP is at threshold, use threshold elevation + TCH.)
"NIXON WP Elevation 845.03." (When MAP is prior to threshold, use computed MSL altitude of the desired descent angle at the MAP.)

(2) For VOR/DME RNAV, if the constraints specified in TERPS paragraph 1523f exist, publish ONLY the reference facility elevation data.

m. RESERVED.

n. Magnetic Variation. Except as provided in paragraph 804, enter the magnetic variation value upon which the procedure design and documentation is based. Ensure that it is the variation upon which the final approach radial, bearing, or course are predicated.

(1) For non-RNAV SIAP's, enter the officially assigned variation value of the facility providing final approach course guidance.

(2) For VOR/DME RNAV SIAP's, enter the officially assigned variation value of the reference facility.

(3) For non-VOR/DME RNAV SIAP's enter the officially assigned variation value of the airport served by the SIAP. See paragraph 814k.

(4) For Departure Procedures (DP), enter the officially assigned variation values of the airport served by the DP.

o. Enter the Epoch Year of the variation value as designated by AVN-160 (see paragraph 221c(1).

p. For COPTER point-in-space SIAP's serving more than one landing area, list available landing areas, landing area elevations, the course in hundredths of a degree, and distance from the MAP in hundredths of a mile as follows:

Chevron Heliport, 10, 090.02/2.81
Phi Heliport, 20, 087.11/2.32
Garden Island Seaplane Base, 26, 129.08/14.92

q. Where a VDP is established on a SIAP, identify the location of the VDP as follows:

Chart VDP at ____ DME.
Distance VDP to THR____ miles.
Chart VDP at ____ NM to MAP.

r. On LORAN-C SIAP's, include a reference bearing/distance to one nearby navigational aid.

(1) If the SIAP has a course reversal, define the bearing/distance from the IAF.

(2) If the SIAP has no course reversal, define the bearing/distance from the FAF or IF (or the common IF for multiple terminal routes).

Chart in planview ABC VORTAC to NIXON WP R-128/12.62NM; or Chart in planview XYZ NDB to ECKLS WP Brg 083 FROM/16.65NM.

(3) Where a non-RNAV feeder segment is established, no reference bearing/distance is required.

s. For MLS, enter the following data:

(1) Boresite AZ (mag).

(2) Limits of coverage; e.g., 300M to 060M.

(3) Height above EL antenna for all WP's from FAF to MAP.

PFAF(1590),TP(1496),RP(1183),DH(194),
RWY WP(44).

t. For MLS, describe the curved path including radius and direction of turn, course before and after the turn, along-track distance from each WP:

1.25NM arc to RP
RT 351 deg to 133 deg
6.58 ATD from PFAF
6.33 ATD from TP
0.50 ATD from DH

817. LOWER BLOCKS.

a. City and State. Enter city and state name. The official 2-letter state abbreviations shall be used.

b. Airport - Elevation/TDZE.

(1) Enter the official airport name (as stated on Form 5010-1) and **airport elevation** (as stated in the AMIS/IAPA data base). Submit supporting data with the procedure for verification if a change is indicated. For multiple COPTER point-in-space SIAP's, enter **"various heliports."**

(2) Enter Touchdown Zone elevation (TDZE) (as stated in the AMIS/IAPA data base) for the runway designated in the procedure title whenever straight-in minimums are authorized. Add TDZE for sidestep runway, if applicable. Leave the TDZE blank if straight-in minimums are not authorized. For COPTER point-in-space SIAP's, leave TDZE **blank** (see paragraph 816p).

c. Facility Ident. Enter facility identification. On procedures predicated on proposed facilities and when an identification has not been assigned, leave this space **blank** and NFDC will enter the identification. For RNAV procedures, enter the identification of the SIAP reference facility. For LORAN RNAV procedures, enter the master/ secondary station designation, followed by the Group Repetition Interval (GRI).

Example**: MWX 9960**.

d. Proc. No. Enter procedure identification as determined by TERPS chapter 1, section 6, paragraph 802, of this order. When DME is required for the final approach, include "/DME" as part of the identification; e.g., VOR/DME, ILS/DME, LOC/DME, LDA/DME, NDB/DME.

NOTE: *DME is an MLS component and is not required as part of MLS procedure identification.*

e. Amdt. No. Enter **"Original"** or the amendment number, as appropriate. The amendment number shall be advanced whenever the procedure is revised. The type of revision will determine whether an amendment may be made

APPENDIX 1.

FLIGHT PROCEDURES REFERENCES

APPENDIX 1. FLIGHT PROCEDURES REFERENCES

The following documents form the basic reference library for flight procedures activities.

ORDERS AND NOTICES

Number	Subject
1000.1	Policy Statement of the Federal Aviation Administration
1010.59	Omni-directional Approach Lighting System
1050.1	Policies and Procedures for Considering Environmental Impacts.
1720.23	Distribution of Aeronautical Charts and Related Flight Information Publications
1800.56	Administration of Aviation Standards Activities - Program Guidelines
5010.4	Airport Safety Data Program
5100.38	Airport Improvement Program (AIP) Handbook
6030.1	FAA Policy on Facility Relocations Occasioned by Airport Improvements or Changes
6030.18	Mobile Air Traffic Control, Navigational Aid, Communication and Power System
6030.20	Electrical Power Policy
6050.32	Spectrum Management Regulations and Procedures Manual
6560.10	Runway Visual Range (RVR)
6700.20	Non-Federal Navigational Aids and Air Traffic Control Facilities
6750.16	Siting Criteria for Instrument Landing Systems
6750.24	ILS and Ancillary Electronic Component Configuration and Performance Requirement
6750.49	Maintenance of Instrument Landing Systems (ILS) Facilities
6850.2	Visual Guidance Lighting Systems
6850.5	Maintenance of Lighted Navigational Aids.
6950.2	Electric Power Policy Implementation at National Airspace System Facilities
6980.12	Provision of Remote Monitor for Electrical Power and/or Remote Start of Engine Generators
6980.26	Battery Backup Power Systems - Theory and Selection Guidelines
7031.2	Airway Planning Standards #1 Terminal Air Navigation Facilities and ATC Services
7031.3	Airway Planning Standards #2 Air Route Traffic Control
7032.5	Airport Surface Detection Equipment (ASDE-3) Air Traffic Service Operational Requirements
7100.9	Standard Terminal Arrival (STAR)
7110.10	Flight Services
7110.19	Designation Taxiways as Temporary Runways
7110.22	Arrival and Departure Handling of High Performance Aircraft
7110.65	Air Traffic Control
7110.79	Charted Visual Flight Procedures
7130.3	Holding Pattern Criteria
AT 7130.8	Development of Holding Pattern Criteria and Procedures
7210.3	Facility Operations and Administration
7210.37	En Route Minimum IFR Altitude (MIA) Sector Charts
7232.5	Reduced or Increased Operating Hours for ATCT's/Approach Control Facilities
7350.2	Air Traffic Operational Coding System
7350.6	Location Identifiers
7400.2	Procedures for Handling Airspace Matters
7900.2	Reporting of Electronic Navigation Aids and Communication Facilities Data to the NFDC
7930.2	Notices to Airmen (NOTAM's)
8200.1	United States Standard Flight Inspection Manual
VN 8240.1A	NAVAID Facility and Airport Data Procedures
8240.47	Determination of ILS Glidepath Angle, Reference Datum Heights (RDH), and Ground Point of Intercept (GPI)
8260.3	United States Standard for Terminal Instrument Procedures (TERPS)

VN 8260.4	ILS Obstacle Risk Analysis
8260.15	U.S. Army Terminal Instrument Procedures Service
8260.16	Airport Obstruction Surveys
8260.19	Flight Procedures and Airspace
8260.23	Calculation of Radio Altimeter Height
8260.25	Implementing Epoch Year Magnetic Variation Values
8260.26	Establishing and Scheduling Standard Instrument Procedure Effective Dates
8260.31	Foreign Terminal Instrument Procedures
8260.32	U.S. Air Force Terminal Instrument Procedure Service
8260.33	Instrument Approach Procedures Automation (IAPA) Program
8260.36	Civil Utilization of Microwave Landing System (MLS)
8260.37	Heliport Civil Utilization of Collocated Microwave Landing System (MLS).
8260.38	Civil Utilization of Global Positioning System (GPS)
8260.39	Close Parallel ILS/MLS Approaches
8260.40	Flight Management System (FMS) Instrument Procedures Development
8260.41	Obstacle Assessment Surface Evaluation for Independent Simultaneous Parallel Precision Operations
8260.42	Helicopter Global Positioning System (GPS) Nonprecision Approach Criteria
8260.43	Prioritization for Development of Wide Area Augmentation System GPS Instrument Approach Procedures
8260.44	Civil Utilization of Area Navigation (RNAV) Departure Procedures
8260.45	Terminal Arrival Area (TAA) Design Criteria
8260.46	Instrument Departure Procedure (DP) Program
8260.47	Barometric Vertical Navigation (VNAV) Instrument Procedures Development
8260.48	Area Navigation (RNAV) Approach Construction Criteria
8400.8	Procedures for Approval of Facilities for FAR Part 121 and Part 135 CAT III Operations
8400.10	Air Transportation Operations Inspector’s Handbook
8700.1	General Aviation Operations Inspector's Handbook

ADVISORY CIRCULARS

61-27	Instrument Flying Handbook
70-2	Airspace Utilization Considerations in the Proposed Construction, Alteration, Activation and Deactivation of Airports
70/7460-1	Obstruction Marking and Lighting
70/7460-2	Proposed Construction or Alteration of Objects that May Affect the Navigable Airspace
73-2	IFR Helicopter Operations in the Northeast Corridor
90-42	Traffic Advisory Practices at Airports Without Operating Control Towers
90-45A	Approval of Area Navigation Systems for Use in the U.S. National Airspace System
90-80	Approval for Offshore Standard Approach Procedures (OSAP), Airborne Radar Approaches (ARA), and Helicopter En route Descent Areas (HEDA)
91-14	Altimeter Setting Sources
91-16	Category II Operations-General Aviation Airplanes
91-54	Automatic Reporting Systems-Altimeter Setting and Other Operational Data
97-1	Runway Visual Range (RVR)
120-28	Criteria for Approval of Category III Landing Weather Minima
120-29	Criteria for Approving Category I and Category II Landing Minima for FAR 121 Operators
150/5070-6	Airport Master Plans
150/5200-28	Notices to Airmen for Airport Operators
150/5300-13	Airport Design
150/5340-1	Standards for Airport Markings
150/5340-4	Installation Details for Runway Centerline and Touchdown Zone Lighting Systems
150/5340-14	Economy Approach Lighting Aids
150/5340-17	Standby Power for Non-FAA Airport Lighting Systems

150/5340-18	Standards for Airport Sign Systems
150/5340-19	Taxiway Centerline Lighting Systems
150/5340-24	Runway and Taxiway Edge Lighting Systems
150/5340-26	Maintenance of Airport Visual Aid Facilities
150/5340-27	Air-to-Ground Radio Control of Airport Lighting Systems
150/5390-2	Heliport Design
170-9	Criteria for Acceptance of Ownership and Servicing of Civil Aviation Interest(s) Navigational and Air Traffic Control Systems and Equipment
170-13	Approach Lighting System Configurations and Energy Conservation

TITLE 14, CODE OF FEDERAL REGULATIONS (CFR).

Part 1	Definitions and Abbreviations
Part 71	Designations of Class A, Class B, Class C, Class D, and Class E Airspace Areas; Airways; Routes; and Reporting Points
Part 73	Special Use Airspace
Part 75	Establishment of Jet Routes and Area High Routes
Part 77	Objects Affecting Navigable Airspace
Part 91	General Operating and Flight Rules
Part 93	Special Air Traffic Rules and Airport Traffic Patterns
Part 95	IFR Altitudes
Part 97	Standard Instrument Approach Procedures
Part 103	Ultralight Vehicles
Part 121	Certification and Operations: Domestic, Flag, and Supplemental Air Carriers and Commercial Operators of Large Aircraft
Part 125	Certification and Operations: Airplanes Having a Seating Capacity of 20 or More Passengers or Maximum Payload Capacity of 6000 Pounds or More
Part 129	Operations: Foreign Air Carriers and Foreign Operators of U.S. - Registered Aircraft Engaged in Common Carriage
Part 135	Air Taxi Operators and Commercial Operators
Part 152	Airport Aid Program
Part 157	Notice of Construction, Alteration, Activation and Deactivation of Airports
Part 171	Non-Federal Navigation Facilities

OTHER PUBLICATIONS

Aeronautical Information Manual (AIM)
Airport Facility Directory
Airport Master Record - FAA Form 5010.1
Airspace Dockets
Area Charts
Ceiling-Visibility Climatological Study and System Enhancement Factors, June 1975
Federal Air Traffic Activity
Graphics Notices and Supplemental Data
LORAN Airport Screening Model
LORAN Site Evaluation System (LSES)
Low and High Altitude En Route Charts
National Flight Data Digest (NFDD)
National Plan of Integrated Airport System (NPIAS)
NOS Quarterly Obstacle Memo - Digital Obstacle File
Notices to Airmen (NOTAM's)
OC Charts

OTHER PUBLICATIONS (CONTINUED)

Sectional and Terminal Area Charts
SIAP's, DP's, STAR's, FTIP's
Transmittal Letters (Instrument Approach Procedures)
USGS Topographical Charts

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APPENDIX 2.

OBSTACLE ACCURACY STANDARDS, CODES, AND SOURCES

APPENDIX 2. OBSTACLE ACCURACY STANDARDS, CODES, AND SOURCES

100. UNITED STATES NATIONAL MAP ACCURACY STANDARDS.

With a view to the utmost economy and expedition in producing maps which fulfill not only the broad needs for standard or principal maps, but also the reasonable particular needs of individual agencies, standards of accuracy for published maps are defined as follows:

a. Horizontal accuracy. For maps on publication scales larger than 1:20,000, not more than 10 percent of the points tested shall be in error by more than 1/30 inch, measured on the publication scale; for maps on publication scales of 1:20,000 or smaller, 1/50 inch. These limits of accuracy shall apply in all cases to positions of well-defined points only. Well-defined points are those that are easily visible or recoverable on the ground, such as the following: monuments or markers, such as bench marks, property boundary monuments; intersections of roads, railroads, etc.; corners of large buildings or structures (or center points of small buildings); etc. In general, what is well defined will also be determined by what is able to be plotted on the scale of the map within 1/100 inch. Thus, while the intersection of two roads or property lines meeting at right angles would come within a sensible interpretation, identification of the intersection of such lines meeting at an acute angle would obviously not be practicable within 1/100 inch. Similarly, features not identifiable upon the ground within close limits are not to be considered as test points within the limits quoted, even though their positions may be scaled closely upon the map. In this class would come timber lines, soil boundaries, etc.

b. Vertical accuracy, as applied to contour maps on all publication scales, shall be such that not more than 10 percent of the elevations tested shall be in error more than one-half the contour interval. In checking elevations taken from the map, the apparent vertical error may be decreased by assuming a horizontal displacement within the permissible horizontal error for a map of that scale.

c. Map accuracy testing may be accomplished by comparing the positions of points whose locations or elevations are shown upon it with corresponding positions as determined by surveys of a higher accuracy. Tests shall be made by the producing agency, which shall also determine which of its maps are to be tested and the extent of such testing.

d. Published maps meeting these accuracy requirements shall note this fact on their legends, as follows: **"This map complies with National Map Accuracy Standards."**

e. Published maps whose errors exceed those stated before shall omit from their legends all mention of standard accuracy.

f. Enlargements. When a published map is a considerable enlargement of a map drawing (manuscript) or of a published map, that fact shall be stated in the legend. For example, **"This map is an enlargement of a 1:20,000-scale map drawing,"** or **"This map is an enlargement of a 1:24,000-scale published map."**

g. Data Interchange. To facilitate ready interchange and use of basic information for map construction among all Federal map-making agencies, manuscript maps and published maps, wherever economically feasible and consistent with intended map use, shall conform to latitude and longitude boundary size, being 15, 7.5, or 3-3/4 minutes of latitude and longitude.

101. ACCURACY CODES AND SOURCES.

a. Accuracy Codes. Allowable accuracy of vertical and horizontal data was originally determined by a joint DOD/DOC/DOT task group in 1979. Accuracy codes established by that task group are no longer documented on 8260-series forms. Instead, document the vertical and/or horizontal adjustment applied. See paragraph 909a(1)(g).

HORIZONTAL

Code	Tolerance	
1	+20'	(6 m)
2	+50'	(15 m)
3	+100'	(30 m)
4	+250'	(75 m)
5	+500'	(150 m)
6	+1000′	(300 m)
7	+1/2 NM	(900 m)
8	+1 NM	(1800 m)
9	Unknown	

VERTICAL

Code	Tolerance	
A	+3'	(1 m)
B	+10'	(3 m)
C	+20'	(6 m)
D	+50'	(15 m)
E	+125'	(38 m)
F	+250'	(75 m)
G	+500'	(150 m)
H	+1000'	(300 m)
I	Unknown	

b. Sources. The task group was provided specified accuracies from each of the following sources:

(1) Department of Commerce. Charting information is verified and published by the National Ocean Service (NOS).

(a) Airport Obstruction Chart (OC) obstacle accuracies quoted by NOS are:

1. Flightpath and transitional areas +20' (6 m) horizontally and +2' (1 m) vertically out to 20,000'(6100m). **Code 1A.**

2. Flightpath and transitional area +40' (12 m) horizontally and +20' (6 m) vertically beyond 20,000' (6100 m). **Code 2C.**

3. Horizontal surface area +20' (6 m) horizontally and +5' (1.5 m) vertically. **Code 1B.**

4. Conical surface +40' (12 m) horizontally and +20' (6 m) vertically**. Code 2C**

5. Radio and TV towers +20-40' (6-12m) horizontally, as in paragraphs 101b(1)(a)1 and 2, but +40' (12 m) horizontally and +10' (3 m) vertically if not surveyed for an OC chart. **Code 2B.** (Radio and TV towers are accurate vertically to +2' (.6 m) anywhere on the OC survey if they penetrate a surface) **Code 2A.**

(b) World Aeronautical Chart (WAC), Sectional Chart, and VFR Terminal Chart.

1. Terrain features which are not marked as spot elevations:

Chart	Horizontal	Vertical*
WAC	+1700' (500 m)	+500' (150 m)
Sec	+900' (275 m)	+250' (75 m)
VFR	+500' (150 m)	+250′ (75 m)

*1/2 contour line

2. When **obstacles or mountain peaks** are specifically marked by a spot elevation, the vertical accuracy changes to +3' (1 m). Thus, vertical accuracy code becomes "**1A**."

3. When these charts are used to **establish coordinates**, it must be recognized that Inter-Agency Air Cartographic Committee (IACC) charting standards permit displacement of objects to provide for relative depiction. To account for these additional errors, the horizontal accuracy factors shall be **doubled** for manmade obstacles depicted on WAC, Sectional, and VFR charts.

(2) Department of Defense.

(a) National Imaging Mapping Agency (NIMA): (Outside U.S. Only)

1. NIMA's **taped terrain data** from 1:350,000 charts, +500' (150 m) horizontally and +100' (30 m) vertically. **Code 5E.**

2. Automated Obstruction File, varied accuracy. Use +500' (150 m) horizontally and +125' (38 m) vertically unless verified to a higher accuracy. **Code 5E.**

(b) Air Force Communication Agency. Terrain and structures from Air Force Form 1530. Accuracy varied. Use +500' (150 m) horizontally and +125' (38 m) unless verified to a higher accuracy.

(c) OC surveys conducted by U.S. Army Topographic Units shall have the same accuracy standards as those developed by the Department of Commerce (see paragraph 101b(1)(a).

(3) Department of Transportation. FAA obstacle data for terrain structures are recorded on airspace, airport, and procedures records. If the original source is Obstruction Clearance (OC) or aero charts, accuracies in paragraph 101b(1)(a) are appropriate. Other accuracies are as follows:

(a) Field inspections that employ a theodolite, +50' (15 m) horizontally and +20' (6 m) vertically. **Code 2C.**

(b) Obstruction evaluations: All obstacles, +250' (75 m) horizontally and +50' (15 m) vertically, unless verified to a higher accuracy. **Code 4D.**

(c) Quarterly Obstacle Memo - Digital Obstacle File, depending upon data source, from +20' (6 m) to +1 NM (1800 m) horizontally, and from +3' (1 m) to +1,000' (300 m) vertically. **Code 1A to 8H.**

(d) Airport Field Offices (AFO) may assign their own codes to obstacles on engineering drawings furnished to Flight Standards.

(e) Airway Facility (AF) Division Field Survey; navigation aids, +20' (6 m) horizontally and 3' (1 m) vertically. **Code 6E.** Other obstacles, +50' (15 m) horizontally and +10' (3 m) vertically, unless verified to a higher accuracy. **Code 2B.**

(f) Flight inspection fly-by, +250' (75 m) horizontally and +50' (15 m) vertically. **Code 4D.**

(g) Estimated by airport owner or operator, +1/2 NM (900 m) horizontally and +500' (150 m) vertically. **Code 7G.**

(4) Department of Interior. U.S. Geological Survey data in magnetic tape files are claimed to be accurate to +1,000' (300 m) horizontally and +100' (30 m) vertically. **Code 6E.** For the following charts, when obstacles or mountain peaks are specifically marked by a spot elevation, the vertical accuracy changes to +3' (1 m). Otherwise, these charts have the following accuracies:

(a) Topographical charts (1:250,000 scale), +1,000' (300 m) horizontally and +100' (30 m) vertically. **Code 6E.**

(b) Topographical charts (1**:62,500 or 1:63,360 scale),** +150' (75 m) horizontally and +50' (15 m) vertically. **Code 4D.**

(c) Topographical charts [**1:20,000, 1:24,000) (7 1/2 min. Quad series), and** 1:25,000], +40' (12 m) horizontally and +20' (6 m) vertically. **Code 2C**.

(d) Topographical charts (1:100,000 scale), +40' (12 m) horizontally and +20' (6 m) vertically.

(5) Other.

(a) Tactical Flying Chart, TFC(L), 2nd Series, (1:250,000 scale), +500' (150 m) horizontally and +125' (38 m) vertically. **Code 5E**.

(b) Series M745 (Ausgabe 4-DMG), (1:50,000 scale), +50' (15 m) horizontally and +20' (6 m) vertically. **Code 2C.**

(6) Digital Elevation Data. U.S. Geological Survey data for terrain elevations is typically based on Digital Elevation Models (DEM). National Imaging and Mapping Agency (NIMA) survey data for terrain elevations is typically based on Digitized Terrain Elevation Data (DTED). Source documentation from the NOS supports the following horizontal and vertical accuracies; these values shall be used in instrument procedure construction:

(a) DEM 7.5 Minute (Level 1), +13 m (43') horizontally and +14 m (46') vertically.

(b) DEM 7.5 Minute (Level 2), +13 m (43') horizontally and +17 m (56') vertically.

(**c) DTED 1 Degree (Level 1),** +50 m (164′) horizontally and +30 m (98′) vertically.

(d) DEM 1 Degree (1:250,000 scale), +130 m (427′) horizontally and +30 m (98′) vertically.

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U.S. Department
of Transportation

**Federal Aviation
Administration**

Directive Feedback Information

Please submit any written comments or recommendations for improving this directive, or suggest new items or subjects to be added to it. Also, if you find an error, please tell us about it.

Subject: Order 8260.19C CHG 2, Flight Procedures and Airspace

To: DOT/FAA
ATTN: Flight Procedure Standards Branch, AFS-420
PO Box 25082
Oklahoma City, OK 73125

(Please check all appropriate line items)

An error (procedural or typographical) has been noted in paragraph _____ on page _____.

Recommend paragraph _____ on page _____ be changed as follows:
(*attach separate sheet if necessary*)

In a future change to this directive, please include coverage on the following subject:
(*briefly describe what you want added*):

Other comments:

I would like to discuss the above. Please contact me.

Submitted by: _____ Date: _____

FTS Telephone Number: _____ Routing Symbol: _____