

**BY ORDER OF THE COMMANDER
AIR FORCE RESERVE COMMAND**



AIR FORCE INSTRUCTION 11-230

AIR FORCE RESERVE COMMAND

Supplement 1

26 MAY 2004

Flying Operations

INSTRUMENT PROCEDURES

COMPLIANCE WITH THIS PUBLICATION IS MANDATORY

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Supersedes AFI11-230_AFRCSUP1,
7 April 2004

Pages: 9
Distribution: F

The OPR for this supplement is HQ AFRC/DOVA (Mr. Timothy J. Lovell). This supplement implements and extends the guidance of Air Force Instruction (AFI) 11-230, 1 August 2001. This supplement describes Air Force Reserve procedures to be used in conjunction with the basic instruction.

SUMMARY OF REVISIONS

This supplement modifies the purpose statement from the previous edition to accurately reflect this stand-alone supplement. The content of this supplement has not changed.

1.5.1.1. (Added) Manage all terminal airspace matters at AFRC airfields. This will include, but may not be limited to; determining the adequacy and effectiveness of existing Class C/D airspace and any associated Class D or E (to the surface) extensions. Initiate and manage any airspace actions necessary to ensure the continued safety of flight at their respective airfields. Any airspace actions initiated by the unit shall be forwarded to HQ AFRC/DOVA for review, approval and forwarding to the appropriate AFREP office.

1.5.3.2.1. (Added) If the TERPS database is permanently revised in any manner, i.e., AF Form 3628 or 3629 data is changed, the unit TERPS Manager will provide HQ AFRC\DOVA with an electronic copy of the database. This copy shall be provided prior to developing instrument procedures utilizing the revised database.

1.5.5.1.3. Procedures Listing (AFFSA annual spreadsheet required). If needed, obtain a copy from HQ AFRC/DOVA.

1.5.5.1.11. (Added) Networking Information. AFRC TERPS Manager e-mail address and telephone numbers.

1.5.5.1.12. (Added) Current Procedural Data. In this section, compile the following source documentation (originals, copies, or a statement identifying their location):

1.5.5.1.12.1. (Added) Current AF Form 3628, paper copy only.

1.5.5.1.12.2. (Added) Current AF Form 3629, paper copy only.

1.5.5.1.12.3. (Added) Commissioning/Special and current flight inspection reports for AFRC owned NAVAIDS used for instrument procedure course/altitude guidance/distance measuring. If the NAVAID service volume is restricted in any manner a copy of the restricting flight check report must also be filed.

1.5.5.1.12.4. (Added) Diverse Departure Documentation.

1.5.5.1.12.5. (Added) Diverse Vector Area (DVA) documentation.

1.5.5.1.12.6. (Added) FAA Form 8240-22, **Facility Data Sheet**, for all AFRC owned NAVAIDS used for instrument procedure course/altitude guidance/distance measuring.

1.5.5.1.12.7. (Added) Source Documentation (airfield surveys, ATCALs reports, vegetation height/growth information).

1.5.5.1.13. (Added) HQ AFRC Guidance such as policy letters or interim changes.

1.5.5.1.14. (Added) Visual inspection of the airfield environment and surrounding area log, see **1.5.15. (Added)**.

1.5.5.2.1. (Added) The unit TERPS Managers will provide HQ AFRC/DOVA with a copy of the following CE Maps as they are revised: C-1 (to include contour lines), C-2 (if applicable), E-1, E-2, and E-3 in both printed (Scaled at 1":400') and an electronic copy in a format compatible with AutoCAD 2004.

1.5.7. Note: At AFRC locations without a TERPS function ATCALs Maintenance shall be responsible for completing an FAA Form 8240-22, **Facility Data Sheet**, IAW FAAO 8240.36, *Instructions for Flight Inspection Reporting*.

1.5.11.1. (Added) HQ AFRC/DOVA shall be advised in writing (email is acceptable) of all reviews and comments concerning Notices of Proposed Construction that adversely affect instrument procedures, IFR charts or VFR Traffic Patterns/Routes within 5 duty days of completion.

1.5.12.1. (Added) Advise HQ AFRC/DOVA within 24 hours of any NOTAM issued that revises, cancels, suspends or in any way affects any published instrument procedure.

1.5.15. (Added) Conduct visual inspections of the airfield environment and surrounding area for new, changed, or removed obstructions and any changes to vegetation. These inspections shall, unless documented extenuating circumstances dictate otherwise, be accomplished in conjunction with the Quarterly and Annual Airfield inspections performed by AOM and AM. Ensures that any discrepancies between existing obstacles listed on the current AF Form 3629, electronic and paper, and the current airport environment are resolved and if necessary the AF Form 3629 is corrected.

2.1.3.1. (Added) Facility managers shall be notified in writing, e-mail is satisfactory, of any and all holding pattern restrictions, this documentation shall be maintained in the applicable procedure package (See paragraph 4.12, Item 7b(3) (AFRC)).

2.2.3.1. (Added) A copy of the usage agreement will be maintained in the TERPS continuity folder and a copy sent to HQ AFRC/DOVA for their records.

2.5. **Airspace Requirements.** NOTE All airspace actions initiated by the unit shall be forwarded to HQ AFRC/DOVA for review, approval and forwarding to the appropriate AFREP office.

3.3.1.1.1. (Added) Forward the original and a copy of the diverse departure documentation/departure procedure to HQ AFRC/DOVA for review. Once approved the original with MAJCOM signature will be returned to the unit.

3.3.1.2. NOTE: 4 All Notification shall be made in writing and documentation maintained with the diverse departure forms in the TERPS continuity folder.

Table 3.1. General Guidelines For Determining Obstacle Driven Departure Procedures.

*Note. STANDARD TAKE-OFF MINIMUMS --These can be found in FAR, Part 91.

4.2.3.2.1.1. (Added) Use the following formula to determine the half width of the trapezoid at any point from the point of beginning. Distance from threshold multiplied by 0.23 Plus 1.7 = $\frac{1}{2}$ Width Primary Area.

EXAMPLE: $7 \times 0.23 = 1.61 + 1.7 = 3.31$ NM from centerline. Distances can be feet, meters, kilometers, or nautical miles as long as it remains consistent throughout the formula.

4.2.3.2.3.1. (Added) Use the following formula to determine the width of the secondary trapezoid at any point from the point of beginning. Distance from threshold multiplied by 0.1 = Width Secondary Area. To determine the distance from centerline use the formula Width SEC + $\frac{1}{2}$ Width PRIM = distance of the outside edge of the secondary area from centerline. EXAMPLE: $7 \times 0.1 = .7 + \frac{1}{2}$ Width PRIM (3.31) = 4.01 NM from centerline. Distances can be feet, meters, kilometers, or nautical miles as long as it remains consistent throughout the formula.

4.2.8.1. Documentation from the users' Standardization and Evaluation section describing the type equipment to be used will be included in the procedure package.

4.6. **Combining Procedures** NOTE: For example, when publishing an ILS procedure that depicts the FAF (and/or any other associated fix(es)) by a DME fix and by a crossing radial, four separate 'stand alone' procedure packages are required to support publication: one for the ILS final defined by DME fixes, one for the ILS final defined by crossing radials, and one for each associated localizer final. Each of these "stand alone procedure" packages must contain all portions of the procedure they support; Holding, Initial, Intermediate, Final, Missed Approach, VDP, Minimums, MSA and ESA.

4.12. AF Form 3637, Instrument Approach Procedures.

Item 7. Plan View:

b. Non-Radar:

(3) **Holding Patterns:** Publish the maximum altitude for which the holding pattern was developed. This shall be the maximum altitude to which the obstacle evaluation was performed and is directly related to the holding pattern template size used (e.g., Maximum Holding Altitude 7000).

Item 31 **Remarks.** Note: Explanatory remarks are mandatory (automated or manual form). Some examples of required information are the reasons for selected radials or courses used, segment lengths, fixes, fix crossing altitudes, step down fix use (or decision not to use), etc. Thoroughly document the decision to use a value that is non-standard or less than optimum as defined in applicable AFMAN 11-226 (I) criteria (for example, descent gradient, radial, segment length, etc.).

Item 34 **Approval Signatures** NOTE 3: When the planview or profile depiction is drawn using a computer, provide HQ AFRC/DOVA with a copy of the graphic electronically.

Table 5.1. Procedure Package Requirements.

Forward completed AF Form 3634 or 3637 and a graphic presentation of the procedure electronically to HQ AFRC/DOVA for review approval and forwarding to NGA for publication.

5.3.1. Forward all procedure packages in the format specified in **8.2.** (Added-AFRC).

5.3.2.3.1. (Added) If scale drawings of MVACs, MIFRACs, etc., are developed using computer aided drafting programs, provide HQ AFRC/DOVA with a copy of the file electronically in a format compatible with AutoCAD 2004.

NOTE: CAD drawings may not be substituted for drawings produced by USAF approved TERPS automation software.

5.3.2.7. (Added) The Master instrument procedure package, retained by the unit at all times, and the copy provided to HQ AFRC/DOVA, will be in six-part classification folders (NSN 7350-00-990-8884 or suitable substitute) labeled with the airfield name, ICAO identifier and procedure name, e.g. "Anywhere ARB (KANY) HI LOC/DME RWY 11". These instrument procedures packages shall be compiled in the following format:

5.3.2.8. (Added) Section 1 will contain a sheet used for tracking actions taken with the procedure. Additionally, file any correspondence, Memorandums for the Record etc. pertaining to the procedure under the tracking sheet.

5.3.2.9. (Added) Section 2 will contain the AF Form 3637 for instrument approach procedures or AF Form 3634 for departure procedures. When using automation, also include the TERPS Automation Software produced Data for Plan and Profile View form.

5.3.2.10. (Added) Section 3 will contain the complete TERPS Automation Software build. Be sure to print and include the output list for each segment of the procedure. When building a procedure manually or portions of automated procedures are not available using automation, include the applicable computation sheets.

5.3.2.11. (Added) Section 4 will contain the procedure transparencies.

5.3.2.12. (Added) Section 5 will contain appropriate colored maps, charts, (CHUMed with segment trapezoids drawn, traced, printed or photocopied) or drawings as required and any computer disks (electronic forms or scanned plan and profile views) supporting the procedure.

5.3.2.13. (Added) Section 6 will contain the following forms (as applicable) in the following order from top to bottom:

5.3.2.13.1. (Added) AF Form 3980

5.3.2.13.2. (Added) AF Form 3992 or AF Form 3993

5.3.2.13.3. (Added) FAA Form 8260-2

5.3.2.13.4. (Added) FAA Form 6050-4

5.3.2.13.5. (Added) AF Form 813

5.5.3.2. Send hard copies with required signatures. Due to the length of time required to process a waiver, submit requests for updated waivers to HQ AFRC/DOVA 60 days before the waiver expiration date.

6.1.1.1. (Added) Coordinate with local flying customers to validate and document the operational need for each procedure. Determine if all maintained approaches and departures are necessary to meet a specific mission or training requirement. Also, verify that procedures adequately meet mission needs as published. Documentation shall be published in the quarterly Airfield Operations Board meeting minutes defining all actions taken. The TERPS annual review shall consist of the following:

6.1.1.2. (Added) Using automation, rebuild each instrument approach procedure. Verify controlling obstacles, segment lengths, intercept angles, and descent gradients, etc. Be particularly alert for any warning messages generated by TERPS Automation Software. Highlight and annotate all warning messages. Show manual computations and corrective actions.

6.1.1.3. (Added) Review the following items (as applicable) in all procedure packages, ensuring each is current, and has all required signatures (if necessary):

6.1.1.3.1. (Added) Plots (acetate overlays) of each segment

6.1.1.3.2. (Added) FAA Form 6050-4 (if required.)

6.1.1.3.3. (Added) AF Form 813, Request for Environmental Impact Analysis.

6.1.1.3.4. (Added) FAA Form 8260-2 (required for all named fixes in each package).

6.1.1.3.5. (Added) AF Form 3980 for all non-standard procedures.

6.1.2.3.1. (Added) Review the above items as applicable in all procedure packages, ensuring each is current and has all required signatures (if necessary).

6.1.2.3.2. (Added) Plots (acetate overlays of each segment) shall be updated and filed with every revised procedure build.

6.2.1.3.1. (Added) The number of procedural changes is restricted to three. After three procedural changes have been made, the procedure will be re-accomplished and designated as original.

6.2.1.5.2. **NOTE:** See AFI 11-230, paragraph 1.5.12; and AFI 11-230 AFRC SUP 1, paragraph **1.5.12.1. (Added)**.

8.2. Flight Inspection of Instrument Procedures. Flight inspection requests, for instrument procedures, shall be forwarded to HQ AFRC/DOVA. This request shall be in the form of revised or new instrument procedure packages submitted for review and approval. When submitting new or revised procedures for review, send an exact copy of the original procedure package, compiled IAW **5.3.2.7. (Added)** for HQ AFRC/DOVA files and two (2) procedure packages, developed IAW with **8.2.1.**, specifically for Flight Inspection Central Operations (FICO), to HQ AFRC/DOVA. Include the original AF Form 3637 page 5, this will be signed and returned to the unit. **NOTE:** The recommended method of transmission is by an overnight delivery service, as pouch or regular parcel post can take several weeks to arrive and thus delay the process significantly.

8.2.1. Instrument procedure packages for FICO will be in six-part classification folders (NSN 7350-00-990-8884 or suitable substitute) labeled with the airfield name, ICAO identifier and procedure name, e.g. "Anywhere ARB (KANY) HI LOC/DME RWY 1".

8.2.1.1. This cover letter shall be contained in section 1 of the procedure package. Section 1 shall be marked as: "Point of contact, Description of Procedure Changes and Notes".

8.2.1.2. The applicable form shall be contained in section 3 of the procedure package. Section 3 shall be marked, as applicable: "AF Form 3634, AF Form 3637 or FAA Form 7100-4". When using automation, also include the TERPS Automation Software produced Data for Plan and Profile View form.

8.2.1.3. Color maps, or reproductions thereof, shall be used. Each instrument procedure segment shall be on a separate page. These shall be contained in section 4 of the procedure package. Section 4 shall be marked as "Controlling Obstacles by Procedure Segment".

8.2.1.4. This shall be contained in section 2 of the procedure package. Section 2 shall be marked as: "Graphic Depiction".

8.2.1.5. This shall be contained in section 5 of the procedure package. Section 5 shall be marked as "FAA Form 8260-2".

8.2.1.6. If applicable this shall be contained in section 6 of the procedure package and addressed in the description of the procedure change in section 1. Additionally section 6 shall be marked as "FAA Form 6050-4"

8.2.1.7. If applicable this shall be contained in section 6 of the procedure package, addressed in the description of the procedure change in section 1. Additionally section 6 shall be marked as "AF Form 3980".

8.2.3. (Added) Upon completion/cessation/suspension/cancellation of Instrument Procedure flight checks advise HQ AFRC/DOVA, by e-mail, of the results.

8.2.4. (Added) Upon successful completion of an Instrument Procedure flight check provide HQ AFRC/DOVA with a copy of AF Form 3637, page 5, signed by flight check. Note: Under certain conditions, units may only receive facsimile copies from FICO. These are considered legal copies for record keeping purposes.

11.1.3. Only MAJCOM approved spreadsheets are authorized for use.

11.2.2.3. TERPS Workstations must use MS Windows 2000 operating systems with Service Pack 3 installed, all equipment must be physically located in the TERPS office and conform to the following minimum system specifications:

Platform	Intel P4, 2.40 GHz, 533 MHz FSB, 512 K Cache
Memory	1 GB SDRAM, upgradeable to 2GB
Monitors	Two, 21" with at least 1280x1024 by 256 color capability
Video	nVidia Quadro2 EX, 32MB SDRAM (Supports dual monitors)
Storage	80GB Hard Drive, (2nd 80GB Hard Drive optional) CD-Rewrite (CD-RW) & DVD ROM or DVD/CD R/W COMBO, (DVD R/W Optional) 3.5" 1.44MB Diskette drive
Printers	Laser technology, with minimum 600 dpi resolution. 32MB RAM.
Color Plotter	Ink jet technology, with minimum 600 dpi resolution. Minimum 36x48 (E size) paper size. 32MB RAM

Software	MS Windows 2000, Service Pack 3 Microsoft Office Pro Suite, File Transfer Protocol (FTP) software. AutoCAD 2004LT
Connectivity	Ethernet PCMCIA 10/100 Base T (or appropriate LAN interface card)
Sound capability	Sound Card and Speakers

11.2.4. The TERPS Procedure Development Hardware Grandfather Clause is not applicable to AFRC TERPS Functions. AFRC TERPS Functions shall, as a minimum, have the TERPS computer equipment outlined in [11.2.2.3](#). (AFRC).

11.5.2. A hard copy ECHUM print out for each map series will be kept on file for 3 calendar years.

11.5.2.4.7. (Added) Vegetation. Study master obstacle maps to determine areas of vegetation that could affect procedures. In these areas, add the height of vegetation manually to the controlling obstacle (if the controlling obstacle is terrain). Evaluate all other terrain obstacles within the trapezoid to ensure a new obstacle does not become the controlling obstacle by adding the vegetation. Track vegetation growth and thoroughly document annually.

11.5.2.4.8. (Added) Controlling Obstacles. Manually plot obstacles identified as controlling obstacles from procedures on the master obstacle maps.

11.5.6.1. (Added) Units are provided DVOF DTED and DAFIF revised TERPS databases (as applicable) by HQ AFRC/DOVA. Once the new database is received, any changes identified by HQ AFRC/DOVA shall be validated against existing procedures by the unit. Adverse affects on instrument procedures (to include MVAC, MIFRAC, and MSAW/LAAS data) and required corrective actions shall be identified to HQ AFRC within 5 working days.

11.6.2. Unit TERPS Managers are not authorized to use handheld GPS systems.

11.11.1.4.1. (Added) Terminal Area VFR Operations. The effect upon terminal area VFR operations; e.g., VFR Traffic Patterns, VFR entry and exit routes, VFR holding points, and Simulated Flame Out (SFO) Patterns and routes.

11.11.1.4.2. (Added) VFR Traffic patterns shall be developed and maintained IAW AFI 13-203 Chapter 9.

11.11.1.4.3. (Added) Use the traffic pattern airspace criteria as depicted in FAAO 7400.2, figure 6-3-11, Traffic Pattern Airspace, to determine the area to be evaluated for obstacle clearance in the VFR Traffic Pattern. For Category E aircraft operations use the following distances: a=5.0NM, b= 1.0NM, c=4.0NM, d=1.25NM.

11.11.1.5. **Note:** The unit will not receive FAA Form 7460-2, Notice of Actual Construction or Alteration unless requested from the applicable AFREPs Transportation Assistant.

11.11.1.5.1. (Added) Adjustments to Visual Flight Procedures. Do not disregard proposed construction that impacts VFR procedures regardless of the severity of the impact or whether adjustment to the VFR procedure is feasible. The TERPS Specialist shall not amend a VFR procedure until receipt of the FAA Form 7460-2, Notice of Actual Construction or Alteration, or other notification relative to an obstacle that will have a procedural affect. If during procedural review or while on a site visit, it becomes obvious for

safety reasons that the existence of a previously unknown obstacle requires VFR routes or altitudes to be changed, notify the Wing Standardization and Evaluation Branch immediately to expedite accomplishment of the change.

NOTE: The unit will not receive FAA Form 7460-2, Notice of Actual Construction or Alteration unless requested from the applicable AFREPs Transportation Assistant.

11.11.1.6. Recommendations. If the proposed construction or alteration will have any impact on VFR aircraft operations, procedures, or minimum VFR altitudes, the response back to the FAA Region AFREP should clearly state the extent of these affects. If possible, provide an acceptable solution (i.e., If the proposed antenna is reduced by XX feet, there would be no adverse affect to VFR Routes or Traffic Patterns). Do not consider adjustments to VFR procedures as an acceptable solution.

11.11.1.6.1. (Added) If objecting to the development of an obstruction or airport, at a minimum, the response to the FAA Region AFREP shall comply with AFI 13-201, Para 2.12. Provide a copy of all objections to HQ AFRC/DOVA concurrently with the submission to the FAA Region AFREP.

11.11.2.1.1. (Added) AFRC TERPS Functions shall establish and maintain a functional e-mail box to facilitate the receipt of electronic OE/AAA evaluations and automated FAR PART 77 evaluation results for military surfaces, and VFR Traffic Patterns. This e-mail account should be an un-encrypted NIPRNET account. The address should be: <http://TERPS@mybase.af.mil> and should be listed in the Global Address list as TERPS followed by the office symbol.

11.11.2.4. AFRC unit TERPS Managers are responsible for evaluating detrimental affects to Terminal Area VFR Operations in accordance with FAA Order 7400.2E and all changes and applicable USAF directives. Responses are due to the AFREP offices IAW 11.11.2.4.

12.1.1.1. (Added) The assistant TERPS Manager shall be equally knowledgeable and fully involved in the unit's TERPS activities. This involvement shall be enough to ensure that, in the absence of the TERPS Manager, the assistant TERPS Manager can maintain the program.

Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

Abbreviations and Acronyms

ARP—Airport Reference Point

MOC—Master Obstacle Chart

NAF—Numbered Air Force

A3.5. AFMAN 11-226 (I), Volume 1, paragraph 150d, Coordinating Airspace Action. NOTE All airspace actions initiated by the unit shall be forwarded to HQ AFRC/DOVA for review, approval and forwarding to the appropriate AFREP office.

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Commander