May 19, 2004

Dear Forum Participant

Attached are the minutes of the Aeronautical Charting Forum, Instrument Procedures Group, (ACF-IPG) held April 26-27, 2004 and sponsored by the Air Line Pilots Association (ALPA). Attached to the minutes are an office of primary responsibility (OPR) action listing, an attendance listing, as well as meeting briefing material.

Please review the minutes and attachments for accuracy and forward any comments to the following:

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The AFS-420 web site contains information relating to ongoing activities including the ACF-IPG. The home page is located at http://av-info.faa.gov/terps/ACF-IPG.htm. This site contains copies of past meeting minutes as well as a chronological history of open and closed issues to include the original submission, a brief synopsis of the discussion at each meeting, the current status of open issues, required follow-up action(s), and the office of primary responsibility (OPR) for those actions. We encourage participants to use this site for reference in preparation for future meetings.

ACF Meeting 04-02 is scheduled for **October 25-28** with Advanced Management Technology Incorporated (AMTI), Rosslyn, VA as host. Meeting 05-01 is scheduled for **April 25-28, 2005** with the FAA National Aeronautical Charting Office (NACO), AVN-500, Silver Spring, MD as host.

Please note that **meetings begin promptly at 9:00 AM on Monday**. Please forward new issue items for the 04-02 Instrument Procedures Group meeting to the above addressees not later than October 8th. A reminder notice will be sent.

We look forward to your continued participation.

Thomas E. Schneider, AFS-420
Co-Chairman, Aeronautical Charting Forum,
Chairman Instrument Procedures Group

Attachment: ACF minutes

GOVERNMENT/INDUSTRY AERONAUTICAL CHARTING FORUM
INSTRUMENT PROCEDURES GROUP
Meeting 04-01 Herndon, VA
April 26-27, 2004

1. Opening Remarks:

Mr. Tom Schneider, AFS-420, Flight Standards co-chair of the Aeronautical Charting Forum (ACF) and chair of the Instrument Procedures Group (IPG) opened the meeting at 9:00 AM on April 26, 2004. The Air Line Pilots Association (ALPA) hosted the meeting at their Herndon, VA facility. Mr. Kevin Comstock made welcoming and administrative comments on behalf of ALPA. A listing of attendees is included as attachment 2.

2. Review of Minutes of Last Meeting:

Bill Hammett, AFS-420 (ISI) briefed that the minutes of ACF-IPG 03-02, which was held on October 20, 2003, were electronically distributed on November 10. The revised minutes were also posted on the ACF-IPG web site and a copy provided each attendee. No comments were received. The group agreed that the minutes are accepted as promulgated.

3. Briefings:

a. Multiple Approach Coding.

Sandy Stedman, Jeppesen, presented a briefing on database coding of multiple approaches of the same type to the same runway. U.S. TERPS procedure identification methodology provides for an alpha suffix in the procedure title; e.g. RNAV Z RWY 23 for these situations. Traditionally, avionics databases could not accept this added suffix, as older systems do not have enough character spaces to accommodate the multiple indicator. Therefore, only one approach of a specific type was coded for a given runway. Sandy noted that the problem is not unique to the U.S. and provided multiple approach procedure identification examples from around the world. Since newer avionics can handle the added character, Jeppesen issued a 120-day notice in November 2003 that it would begin coding all multiple approaches with the result that those without multi-approach capability would not receive multiples. After receiving heavy industry comment, particularly from the airlines and ALPA, Jeppesen cancelled the notice. Randy Kenagy, AOPA, asked which avionics could not handle the additional characters since most GA avionics have this capability. Sandy replied that her comments were primarily related to airline FMSs. Most airlines have legacy systems that cannot accommodate the additional character needed for the multi indicator. Sandy provided potential and proposed solutions for the problem. The recommended solution was for individual states to determine a predominant approach for the runway based on selective criteria; e.g., lowest minima, most advantageous for air traffic flows, non-precision approach with vertical guidance, etc. The chart and database coding for this predominant approach would show a blank in the multiple indicator field. In this was, it would be clear to pilots that the approach without a suffix was the one in the database. The remaining approaches would be coded with the appropriate Z, Y, or X suffix and would be available to those with the capability to use them. Sandy closed by noting that there is general agreement on the proposed concept among the ATA FMS RNAV Task Force and Regional Airline Association (RAA) Technical Committee, and requested that

AFS-400 consider the Jeppesen proposal adoption by the FAA. A discussion period followed where Randy Kenagy, AOPA, and Steve Bergner, NBAA, supported including unnamed ATD stepdown fixes on LNAV/VNAV approaches. Randy also strongly recommended an interim change to facilitate use of the existing RNAV approaches that are not coded. He noted that AOPA has over 70,000 members that are multi approach capable. Tom Schneider agreed to take the Jeppesen recommendation to AFS-400 for study. A copy of Ms. Stedman's power-point slides is included as attachment 3.

b. TERPS Changes and 14 CFR, Part 97.

Tom Schneider, AFS-420, provided a briefing regarding a recent rule change to Part 97. When Part 97.20 was revised, Orders 8260.3, *U.S. Standard for Terminal Instrument Procedures (TERPS)*, and 8260.19, *Flight Procedures and Airspace*, were incorporated by reference (IBR). The unintended result is that all TERPS criteria and policy changes to these orders must now go through the rule-making process. If retained, this will add approximately one year to the current coordination processing time. AFS-400 is actively working with the Office of Rulemaking and FAA's Office of Chief Council to reverse this ruling. Progress is being made and it is hoped to process the change as "direct to final rule". In the interim, TERPS Change 20 is being held in abeyance. Tom agreed to keep the group posted.

4. Old Business (Open Issues):

a. 92-02-104: TERPS paragraph 323a, Precipitous Terrain Additives.

Tom Schneider, AFS-420, briefed that AFS-420 and AVN-100 are jointly working on an implementation plan. As briefed at the last meeting, the automated precipitous terrain software has been developed and is scheduled for inclusion in TERPS change 20. Mark Ingram, ALPA, noted that since FAA's IAPA system is currently capable of applying the automated adjustment, why doesn't the FAA use the software in the interim period awaiting Change 20. Steve Bergner, NBAA, supported this position, stating that if it is available, it should be used. Tom responded that several issues must be resolved first. Specifically, should the software be applied to vertically guided final approach segments? Also, where should the software be applied? AVN-100 recommends application only in designated mountainous areas (DMAs) under Part 95. AFS-420 desires application to all intermediate and final approach segments regardless of airport location; therefore, a compromise plan will have to be developed. Steve suggested that immediate application in DMAs and other areas later. Tom closed by stating that the Manager, AFS-420 is aware of the issue and has promised a meeting upon his return from extended temporary duty in Washington, DC.

Status: AFS-420 will continue tracking the program and report at the next meeting. Item Open (AFS-420).

b. 92-02-105: Review Adequacy of TERPS Circling Approach Maneuvering Areas and Circling at Airports with High Heights Above Airports (HAAs).

Bill Hammett, AFS-420 (ISI), briefed that the new circling criteria has been pulled from TERPS Change 20 due to questions regarding the validity of the data used in the previous Airspace Simulation and Analysis for TERPS (ASAT) study upon which the new criteria were developed. AFS-420 will forward the request for ASAT re-validation to AFS-440. There was a brief discussion on the variances between PANS-OPS and TERPS. ICAO areas are larger than

TERPS to accommodate higher operating speeds by category. Ted Thompson, Jeppesen, noted that after the Air China accident in Korea, his company notes ICAO Pans Ops on the procedure chart to reflect which criteria was used. Randy Kenagy, AOPA, noted that if new criteria were developed, then the new circling dimensions should be published in the AIM. It was also asked whether the US would annotate new criteria on charts for procedures developed under new criteria. Kevin Jones, Southwest Airlines, stated that pilot procedures should not change; rather, criteria should be developed to accommodate operations. Kevin Comstock, ALPA, requested further detail on the reason the new criteria was pulled from Change 20. Bill responded that AOPA had formally objected that the larger areas caused an unnecessary impact on category A and B aircraft. After a short dialog, Kevin stated that if AOPA did not provide data to refute the proposed criteria change, then it should go forward as presented and briefed at previous ACF meetings. Kevin re-affirmed the ALPA position that this issue is important and should go forward ASAP, especially for category C and D aircraft operations. Tom agreed to take the comments back to AFS-420.

Status: AFS-420 to review circling parameters and request AFS-440 re-accomplish the ASAT study to determine whether new criteria is necessary. Item Open (AFS-420/440).

c. 92-02-110: Cold Station Altimeter Settings.

Mark Steinbicker, AFS-410, briefed that his office has looked into the issue. There appears to be three options; 1) ignore the risk, 2) recognize the risk and mitigate via procedure design changes, or 3) incorporate operational changes through ATC/pilot procedures). The general consensus is that the risk cannot be ignored; therefore, the discussion focused on whether a solution would be criteria-based or operational. Frank Flood, Air Canada, stated that implementation of cold temperature adjustments is necessary because, as we move toward a RNP NAS, it is vitally important to know exactly where the aircraft is. Frank further briefed that Air Canada publishes a correction table in the front of their flight manuals. Pilots are instructed when and how to make adjustments. He also pointed out that awareness is essential and applauded efforts to educate pilots of the problem. Frank also mentioned a recommended procedure provided by ICAO. The pilot's own 'rule of thumb' is that -10 Celsius = -10% altitude error (too low). Vincent Chirasello, AFS-410, suggested the ACF decide on a recommendation that would be presented to the Performance-based Aviation Rulemaking Committee (PARC). John Moore, NACO, asked why the PARC. Kevin Comstock, ALPA, responded that the PARC is already addressing incorporating cold temperature adjustments in RNP criteria. If incorporated in RNP criteria, it should be applicable to all procedures. Of primary concern is that the greater the distance from the altimeter reporting station, the greater the risk of an altitude error induced by cold temps. Most affected are initial, intermediate and final approach altitudes. Unless a cold temperature adjustment is made, aircraft are flying too low and required obstacle clearance (ROC) as well as ATC separation is reduced. After discussion, the group agreed that the initial focus should be on procedural design followed by ATC procedures. Tom Schneider, AFS-420 recommended taking the Canadian procedures to the PARC. Mark Ingram, ALPA, stated that incorporating a correction in procedure design is preferred; however, the Canadian procedures could be used in the interim. Randy Kenagy, AOPA, questioned the safety and operational impact, emphasizing that data was needed. Kevin Comstock, ALPA, noted that the FAA's Atlantic City Technical Center has validated that the ICAO values are correct. Mark will take the ACF feedback to the PARC and report at the next meeting.

Editor's Note: *A new issue 04-01-251 regarding cold temperature procedural chart notes was presented under new business. It was decided that the new issue would be addressed in conjunction with this issue. See the ACF-IPG Open History File for complete text.*

Status: AFS-410 will work the issue and report. Item Open (AFS-410).

d. 93-01-121: Provision of Current IAP Procedural Directive Guidance to the Aviation Community.

Tom Schneider, AFS-420, briefed a report provided by Steve Winter, AFS-420. The Instrument Procedures Handbook, FAA-H-8261-1, has been completed and sent to the printer. The publication should also be on the AFS-420 web page within the next two weeks. Tom had a copy of the Handbook available for review by anyone interested.

Status: Item Closed.

e. 96-01-166: Determining Descent Point on Flyby Waypoints (Originally: Definition of "On Course").

Vinny Chirasello, AFS-410, briefed that there is no change in the status. A second resolution developed by his office was met with a second non-concur within AFS-400. The non-concur centered on different phases of flight, types of procedures, and differing avionics functioning. Work to resolve the non-concur prior to the August 7 AIM cut-off date is on going.

Status: AFS-410 to develop AIM guidance. Item Open (AFS-410).

f. 98-01-197: Air Carrier Compliance with FAA-specified Climb Gradients.

Jerry Ostronic, AFS-220, apologized for past lack of support from AFS-200 on resolving this issue. They appreciate the significance of the issue; however, staffing constraints precluded action. He briefed that he has contacted AGC on this issue and they hope to have a response to the ALPA letter by the end of May. His office is also looking for possible solutions in Part 121.97 and pilot-in-command actions at special airports. He requested more specifics; e.g. airports, procedures, and what aircraft may be affected. Kevin Comstock, ALPA, responded that the problem exists at all airports with a climb gradient required departure. Kevin Jones, Southwest Pilots Assn., offered the LOOP 4 SID out of LAX as a classic example. Mark Ingram, ALPA, added that the only solution is that it must be a dispatch requirement to advise aircrews what actions are necessary to meet a required climb gradient. Jerry responded that there are several ways to address the problem; e.g., reduce weight, increase thrust, etc. Mark asked if it was a legal requirement to meet published climb gradients. Jerry responded that AGC is currently addressing that question. The bottom line is that AFS-200 can't mandate what is not regulatory. The first step is to get an AGC opinion. If AGC responds yes, AFS-200 will implement the requirement. If the response is no, rulemaking action will be required. Jerry will continue to work the issue and report at the next meeting. Tom Schneider, AFS-420 thanked Jerry for representing AFS-200 and recommended they continue to be active ACF-IPG participants.

Status: AFS-200 to follow up AGC response to the ALPA 1998 letter. Item Open (AFS-220).

g. 98-01-199: RVR Accuracy and Conflict with Flight Visibility.

Vinny Chirasello, AFS-410, briefed that an AIM change to paragraph 5-4-18 has been submitted for publication on August 7. The change will provide a conversion table to be used to convert RVR to either ground or flight visibility. A similar change to the FAA Terminal Procedures Publication (TPP) legend will also be required to ensure all material is in agreement. John Moore, AVN-503, offered to staff this as an IACC Requirement Document (RD) through the IACC at the next Member Point of Contact (MPOC) meeting. Bill Hammett, AFS-420 (ISI) recommended that the TPP legend change be made coincidental with the August 7 AIM publication to ensure agreement. There was some discussion and wordsmithing of the proposed language and conversion table. Tom Schneider, AFS-420, noted that this was a stop-gap measure pending acceptance and publication of a new Chapter 3 for TERPS that will achieve FAA/JAA harmonization. He recommended that a Part 91.175 rule change effort await the new TERPS criteria. Jerry Ostronic, AFS-220, agreed to review guidance in FAA-H-8083, *Instrument Flying Handbook*.

Status: 1) AFS-410 will monitor AIM publication of the conversion table, 2) AVN-503 will submit a RD for the TPP changes, and 3) AFS-220 will review guidance in the Instrument Flying Handbook. Item Open (AFS-410, AVN-503, and AFS-220).

h. 98-01-206: Washington DC P-56 Airspace and KDCA IFR Departures.

Brad Rush, AVN-101, briefed that the original DPs have been overcome by events. He also noted that within the past few months the Washington DC restricted areas seemed to be stabilizing and work could begin anew. Vinny Chirasello, AFS-410, noted that the AFS-400 Procedure Review Board (PRB) has identified operational concerns with the original WENKO and KNAWS SIDs. New players need to review the issue from scratch. Bill Hammett, AFS-420 (ISI) recommended that new procedures need to be initiated at the RAPT level and re-developed by AVN-100. He further recommended the issue be closed; the group concurred.

Status: Item Closed.

i. 99-01-215: Radar Required SIAPs.

Brad Rush, AVN-101, provided ALPA the bi-annual spreadsheet indicating progress. All procedure development work has been completed. The last procedure amendment has been forwarded for charting on June 10th. Brad recommended the issue be closed. Kevin Comstock, ALPA, concurred and thanked Brad for the AVN-100 response to this issue.

Status: Item Closed.

j. 99-02-216: Elimination of Excess Verbiage on DP's and STARs.

Paul Ewing, ATP-500 (AMTI) briefed that the revised Order 7100.9, *Standard Arrival Routes,* has been published. The verbiage "descend via" will be used on future STARs and unnecessary text has been eliminated in favor of graphic depiction wherever possible. Frank Flood, Air Canada, noted during the discussion that charting "expect to cross" does not make an altitude restriction mandatory. Firm language; e.g., "cross at" assures no pilot/controller confusion. Current SIDs and STARs with charted excessive verbiage will be cleaned up during the review/revision process. All agreed the issue may be closed.

Status: Item Closed.

k. 00-02-229: Turbine Powered Holding

Bill Hammett, AFS-420 (ISI), briefed that this issue remains open pending receipt of a formal memorandum from ATP-120 to AFS-420 stating that 175 KIAS holding is no longer required above FL 180. The previous ATP-120 representative had stated this position in open forum; however, AFS-420 would like the position in writing prior to revising Order 7130.3, *Holding Pattern Criteria*. Unfortunately, the ATP-120 representative was not in attendance due to a family emergency. The chair took an IOU to follow this up with ATP-120.

Status: 1) The ACF-IPG chair will follow up the memorandum requirement with the Manager, ATP-120. 2) AFS-420 to revise Order 7130.3 when notification received. Item Open (ATP-120 & AFS-420).

l. 01-01-234: Designation of Maximum Altitudes in the Final Approach Segment

Brad Rush, AVN-101, briefed that all recommended actions resultant from the AFS-400 PRB have been accomplished by AVN-100. The altitude restrictions on the ILS or LOC and RNAV approaches to runway 7 have been standardized at maximum 1200' and the missed approach note regarding the 1200' maximum altitude has also been incorporated. Orlando Int'l is now depicted on all Orlando Executive procedure planviews and visa-versa. The "radar required" note is also published in the AFD. Bill Hammett, AFS-420 (ISI) noted that there was still clean up required on the VOR/DME RWY 7 approach. If this approach is not used simultaneously with Orlando Int'l runway 17 & 18 approaches then the maximum altitude restriction should be deleted. If the approach is used, the restriction should be changed to maximum 1200' and the missed approach note added. Brad agreed to research this and amend the procedure accordingly. Bill also noted that the February Pilot/Controller Glossary (PCG) was not updated to resolve the contradictions in missed approach guidance [(AIM paragraph 5-4-19b), PCG definition of "Missed Approach", and the Instrument Flying Handbook page 10-22)]. This has been an ATP-120 tasking since the October 2001 meeting and despite repeated assurances from the previous ATP-120 representative has still not been completed. Vinny Chirasello, AFS-410, stated that his office would follow up this tasking through ATP-120 to ensure submission by August 5 for publication in the February 16, 2005 AIM.

Status: 1) AVN-101 to amend the VOR/DME RWY 7 approach at Orlando Executive; and 2) AFS-410 to coordinate PCG changes with ATP-120. Item Open (AVN-101 and AFS-410/ATP-120).

m. 01-02-235: Harmonization of RNAV DPs

Mark Steinbicker, AFS-410, briefed that a number of AIM changes have been published, but the issue is too big to fix via the AIM alone. AC 90-US RNAV, which is under development, will harmonize procedure design criteria, avionics certification, and pilot procedures. If GPS is required for a DP, the pilot must complete an availability check prior to using the procedure. AFS-410 does not intend to issue guidance on how the pilot is to accomplish the check; that will be left up to the operator. All are aware that there are avionics systems that are not operationally suited to specific procedures. In response to industry's feedback of "...don't tell us how to fly our airplanes…", FAA has decided to leave the responsibility for determining procedure applicability with the pilot. Steve Bergner agreed that with the on going work with AC 90-US RNAV, the issue could be closed.

Status: Item Closed.

n. 02-01-237: Intermediate Fix (IF) Charting**.**

Mike Riley, NGA, briefed that he took the ACF-IPG comments back to the military FLIP Coordinating Committee (FCC) and the IACC Requirements Document (#544) was approved with a military exception. The intermediate fix will be charted as (IF) on FAA charts but not military charts unless requested by the procedure proponent. During discussion, it was asked if this would cause confusion with the "IF" used as the initial fix in RNAV DPs. It was agreed that this should not be a problem as the DP initial fix is used for coding purposes only and not depicted on RNAV departure procedure charts. It was agreed that identifying the intermediate fix on charts will aid in chart/database harmonization efforts and be useful in air traffic control direct-to clearances (see issue 02-02-246).

Status: Item Closed.

o. 02-01-238: Part 97 "Basic" Minima; ATC DP Minima, and DP NOTAMs.

Bill Hammett, AFS-420 (ISI), briefed that there had been no progress on this issue due to higher priority taskings.

Status: 1) AFS-420 to provide DCP information to ATP-320. 2) ATP-500 to address STAR NOTAMs. Item Open (AFS-420 & ATP-500).

p. 02-01-239: Minimum Vectoring Altitude (MVA) Obstacle Accountability; Lack of Diverse Vector Area (DVA) Criteria.

Steve Bergner, NBAA, briefed an April 5 NBAA press release that announced that FAA had agreed to release MVA/MIA chart data files to qualified aviation interests. In the press release, FAA emphasized that the data is released for informational purposes only and that there would be no changes in guidance for controller and pilot actions pertaining to ATC assigned altitudes. Steve noted that the first release is scheduled for May 31st. Bill Hammett, AFS-420 (ISI) briefed that the new, expanded criteria for MVAC development is still on schedule for inclusion in TERPS, Change 20. Brad Rush, AVN-101, briefed that previously noted MVAC errors had been forwarded to the applicable ATC facilities for correction. Brad also briefed that AVN has formed an ad-hoc group to resurrect the project to develop an MVA automation tool and that Air Traffic's ATA-40 will play a role in the project. It is planned that the tool will serve both the development and approval processes. Brad further briefed that once developed, the tool would be certified by AVN and that once certified, it should be possible for air traffic facilities to develop MVA/MIA charts using the tool without the need for further AVN review/approval. Tom Schneider, AFS-420, noted that while MVAC design must remain under the purview of the ATC facility, Flight Standards is the policy authority for instrument procedures. Frank Flood, Air Canada, recommended incorporating cold temperature adjustment in the MVA automation tool. This will provide a great opportunity to assess the cold temperature impact on air traffic. Kevin Comstock, ALPA, strongly endorsed the suggestion. Both NBAA and ALPA recommended ACF progress reports on the automation development. Brad agreed to provide progress reports.

Status: AVN-101 will provide progress reports on the MVAC development tool. Item Open (AVN-101).

q. 02-01-241: Non Radar Level and Climbing Holding Patterns.

Bill Hammett, AFS-420 (ISI) noted that ATP-120 still has an IOU from previous meetings to issue an AT Bulletin article to ensure that controllers are aware of which holding patterns have been evaluated for a climb-in hold (CIH). This information is currently only available on the Form 8260-2 supporting for the fix/NAVAID.

Status: ATP-120 to prepare an ATC Bulletin addressing impromptu CIH clearances. Item Open (ATP-120).

r. 02-01-243: Holding Pattern Definition.

Tom Schneider, AFS-420, presented the AIM submissions that will be published in August. All agree that the submission adequately addresses the original issue, regarding RNAV holding. However, Steve Bergner, NBAA, noted that some FMS' provide positive course guidance (PCG) throughout the holding pattern and do not use along track distance (ATD) to specify the end of the outbound leg. He recommended a clarification note to the proposed AIM material. Tom agreed to take this comment back to AFS-420. Paul Ewing, ATP-500 (AMTI) noted that "ATD" was an incorrect acronym for along track distance. The pilot/controller glossary specifies "LTD"; "ATD" is used for Air Traffic Division. Tom noted that "ATD" has been used in the TERPS arena since the advent of RNAV and Brad Rush, AVN-101, pointed out that "ATD" is published on approach charts. No one, other than air traffic representatives was aware of the use of "LTD". Tom will also take this comment back to AFS-420 for staffing. A copy of the AIM submission is included as attachment 4.

Status: AFS-420 to address the NBAA comments regarding advanced FMS holding and research the use of "ATD" vs. "LTD" as the correct acronym for along track distance. Item Open (AFS-420).

s. 02-01-244: Cancellation of GPS Overlay Approaches.

Brad Rush, AVN-101, briefed that the number of overlay approaches is down to approximately 1,700 from 4,500. His office is still developing stand-alone approaches and canceling overlay approaches under current policy. Bill Hammett, AFS-420 (ISI), noted that AOPA had provided specific recommendations at the last meeting for the overlay cancellation process. He further noted that coordination is required for all procedure cancellations and recommended the issue be closed. Randy Kenagy, AOPA, noted that coordination between AVN-100 and AOPA has improved. Kevin Comstock, ALPA, asked the impact of losing fixes when some overlays are cancelled. Brad stated the requirement to name all fixes would mitigate this. Ted Thompson, Jeppesen, agreed that this is not a problem. The group agreed the issue could be closed.

Status: Item Closed.

t. 02-02-246: Turn Angle Limits for RNAV Approaches Without TAAs.

Steve Bergner, NBAA, gave a presentation highlighting the problems associated with air traffic control use of "direct-to" clearances in RNAV approach clearances. He noted that in his experience, these clearances continue to proliferate. FAA Notice 7110.329 did not resolve the issues and further clarification is required to resolve contradictions in the AIM and Order 7110.65. Current ATC directives do not allow direct to IF clearances. Pilots and controllers

alike desire this option; however, the guidance on using this procedure must be clear and have specific limitations; e.g., no greater than 90 degrees from the final approach course. Steve's briefing also provided several examples of charting anomalies where the charting of (IF) at the intermediate fix and (IAF/IF) at combination fixes would clarify procedures for pilots and controllers alike. Bill Hammett, AFS-420 (ISI) noted that a central issue that will have to be addressed is a Chief Counsel decision on whether a "direct-to" clearance in a radar environment can be considered the same as a "radar vector". Paul Ewing, ATP-500 (AMTI) agreed to coordinate this issue with AGC and work the AIM and Order 7110.65 material with ATP-120. A copy of Steve's briefing slides is included as attachment 5.

Status: ATP-500 and ATP-120 will continue to work the issue and report. Item Open (ATP-500/120).

u. 03-01-247: Holding Pattern Criteria Selection and Holding Pattern Climb-in-Hold Issues.

Tom Schneider, AFS-420, briefed that the GPS holding pattern study has been tasked to AFS-440 for Airspace Simulation and Analysis for TERPS (ASAT) study. A test plan has been developed that will not only assess the original GPS holding issue, but include helicopter and STOL holding patterns as well. The analysis will take approximately two years. Mark Ingram, ALPA, asked if the smaller GPS holding patterns could be held in abeyance pending results of the study. Steve Bergner, NBAA, noted that pilot use of GPS to navigate to a holding fix does not necessarily mean that positive course guidance is provided while holding. Both ALPA and NBAA believe that the GPS criteria is suspect and recommend using the larger conventional holding patterns to preclude having to amend procedures later. Jeff Formosa, MITRE, asked why RNP holding was so far down on the ASAT priority list. Tom agreed to discuss this and the ACF-IPG concerns with the Managers of AFS-420 and AFS-440.

Status: 1) ACF-IPG Chair to forward group concerns to the managers of AFS-420 and AFS-440; 2) AFS-440 to conduct ASAT/simulator analysis and report. Item Open (AFS-440).

v. 03-02-248 Substitution of GPS for Missed Approach Operations.

Vinny Chirasello, AFS-410, reported that his office is working the issue. Several meetings have been held and it has been determined that legal issues are involved. There are also TSO questions regarding supplemental vs. sole means navigation. A legal opinion will have to be obtained from FAA Chief Counsel. Randy Kenagy, AOPA, asked if WAAS is acceptable for substitution and Vinny responded yes.

Status: AFS-410 will continue to research the issue and report. Item Open (AFS-410).

5. New Business:

a. 04-01-249 RNAV Terminal Routes for ILS Approaches.

New issue presented by Steve Bergner, NBAA, recommending that RNAV should be used in conjunction with conventional ILS approaches to enhance efficiency. Ted Thompson, Jeppesen, stated that there has been discussion on this issue within Jeppesen and he does not recall any contradiction with coding RNAV transitions to ILS final approach courses. He believes the suggestion is acceptable but will research procedure-coding capabilities. Steve

suggested that two procedures could be developed and only one coded. Ted responded that this could create chart-database harmonization problems. Kevin Comstock, ALPA, asked if this concept was originally proposed for Order 8260.51 but dropped by RNP purists. Tom Schneider responded that the proposed combined RNAV order would assess using RNAV to join conventional final approaches.

Status: 1) AFS-420 to consider the proposal in the combined 8260-RNAV Order, and 2) AVN-503 and Jeppesen to research coding capabilities and report. Item Open (AFS-420, AVN-503 and Jeppesen.

b. 04-01-250 RNP and Climb Gradient Missed Approach Procedures.

New issue presented by Steve Bergner, NBAA. Steve noted that in many cases specifying a climb gradient for the missed approach may provide lower landing minimums. Alternatively, an RNP missed approach design may be able to take advantage of a less onerous route that will eliminate the need for a climb gradient. He used Rifle, CO as an example. Steve further noted that criteria already exist to provide US military operations with climb gradient missed approach procedures where reasonable and where an operational advantage will be achieved. The high-performance business aircraft fleets are fully capable of these higher gradients and should be given the same operational flexibility. Frank Flood, Air Canada, commented that EUROCONTROL routinely allows 3-5% missed approach climb gradients to gain operational advantages. Vinny Chirasello, AFS-410, noted that SAAAR will provided the desired concept. Steve noted that NBAA cannot live with Special approaches, these procedures must be public under Part 97. Ted Thompson, Jeppesen, noted that developing multiple missed approaches for a single approach would result in the need to code duplicate versions of the same procedure. This would not be feasible and separate procedures with suffixes in the identification would be required. Tom Schneider, AFS-420, commented that his office is studying the feasibility of linear obstacle evaluation areas (OEAs) vice trapezoids for RNP procedure design.

Status: AFS-420 to consider the proposal and report. Item Open (AFS-420).

c. 04-01-251 Cold Temperature Correction Procedural Notes.

Ted Thompson, Jeppesen, presented this issue on behalf of the Air Transport Association (ATA) FMS/RNAV Task Force and Chart & Data Display Committee (CDDC). ATA is concerned that the wording of the note ("Baro /VNAV not authorized below -XX°C") is often misinterpreted by pilots. Pilots are interpreting the note to mean that constant angle descent operations are not applicable and "dive and drive" applies. In fact baro- VNAV is usable with cold temperature correction. Additionally, since the note only applies to RNAV approaches, pilots falsely assume that conventional navigation procedures are satisfactory. Bill Hammett, AFS-420 (ISI) suggested that this issue be accepted and combined with Issue 92-01-110, which is currently being staffed by AFS-410. The group concurred.

Status: Item Closed (to be addressed by AFS-410 in conjunction with 92-02-110).

d. 04-01-252 ADF Required Equipment Notes.

Ted Thompson, Jeppesen, presented this issue on behalf of the Air Transport Association (ATA) FMS/RNAV Task Force and Chart & Data Display Committee (CDDC). ATA is

concerned that the equipment restriction note “ADF required” is decades old and does not adequately recognize newer alternate methods of identifying aircraft position. Some large commercial operators no longer equip their airplanes with ADF receivers. Alternative wording was suggested. Vinny Chirasello, AFS-410, responded that current AIM guidance is explicit in exactly what can be used to substitute for ADF. Brad Rush, AVN-101 stated that equipment requirement notes are a documented part of the procedure and formal amendments would be required to change them. Avoiding the amendment process was included in the rationale to publish the substitution guidance in the AIM. Randy Kenagy, AOPA, added that if the note was changed, clear guidance must be published on exactly what equipment could be used. Ed Ward, Southwest Airlines, briefed a recent instance at Buffalo, NY where ATC would not clear the aircraft for an ILS approach when the NDB was out, even after the pilot advised he was capable of GPS substitution (AIM paragraph 1-1-19-f). Discussion led the group to believe that this was an isolated controller education issue. The group consensus was to leave the issue alone.

Status: Item Closed.

e. 04-01-253 LNAV/VNAV Landing Minimums.

Ted Thompson, Jeppesen, presented this issue on behalf of the Air Transport Association (ATA) FMS/RNAV Task Force and Chart & Data Display Committee (CDDC). ATA is concerned that LNAV/VNAV landing minimums are sometimes equal to or greater than the corresponding LNAV-only minimums on an approach. This seems illogical and makes no operational sense because there is no perceived advantage for utilizing VNAV as far as landing minimums are concerned. Also, on some approach charts, the LNAV/VNAV minimums column is labeled “NA” or left blank when VNAV minimums are not be established or available. The chart reflects the information on the 8260 procedure source document. When the column is left ‘blank’ or listed as ‘NA’, this incorrectly implies that VNAV is not authorized at all. Vince Massimini, MITRE, stated that LPV was developed to preclude this scenario. Tom Schneider, AFS-420, agreed to research guidance in Order 8260.19 and report.

Status: AFS-420 to review guidance in order 8260.19. Item Open (AFS-420).

f. 04-01-254 DME/DME RNP 0.3 Procedural Notes.

Ted Thompson, Jeppesen, presented this issue on behalf of the Air Transport Association (ATA) FMS/RNAV Task Force and Chart & Data Display Committee (CDDC). ATA is concerned that the wording of procedural notes for DME/DME updating is too restrictive. Currently, these procedural notes read “DME/DME RNP 0.3 not authorized”. ATA recommends the FAA modify these DME/DME procedural notes on RNAV and RNP procedure sources to appropriately read “Use of DME/DME RNP 0.3 requires specific operator authorization”. Brad Rush, AVN-101, stated that the notes are added as a result of flight inspection results. If operators desire, they can request a Special IAP. Discussion revealed that the RNP steering committee as well as a FAA DME/DME Implementation Team (DDIT) under ATP-500 is looking at the issue. The ACF will address charting issues once all technological issues are resolved. The group consensus was to close the issue pending the results of ongoing studies.

Status: Item Closed.

g. 04-01-255 Rounding of HAT Values for LPV and RNP (SAAAR) Approaches. New issue presented by Vince Massimini, MITRE. Vince's presentation pointed out that the non-precision rounding process (upper 20' increment) for LNAV/VNAV and RNP unnecessarily penalizes visibility minima. His recommendation is that HAT values should not be rounded for any vertically guided approach. Alternatively, if a rounding process is used make the value uniform. A copy of Vince's briefing slides is included as attachment 5. Tom Schneider, AFS-420, agreed to take the issue to AFS-420 for study.

Status: AFS-420 to review the issue and report. Item Open (AFS-420).

6. Next Meeting: ACF Meeting 04-01 is scheduled for **October 25-28, 2004** with Advanced Management Technology, Incorporated (AMTI), Rosslyn, VA. as host. Meeting 05-01 is scheduled for **April 25-28, 2005** with the FAA National Aeronautical Charting Office (NACO), AVN-500 as host.

7. Attachments (6):

1. OPR/Action Listing.
2. Attendance Listing.
3. Jeppesen Briefing Slides (Multiple Approach Coding)
4. AIM Change (Holding Pattern Definition)
5. NBAA Briefing Slides (Direct-to Approach Clearances)
6. MITRE Briefing Slides (Rounding of HAT Values)

Please note the attached Office of Primary Responsibility (OPR) listing (attachment 1) for action items. It is requested that all OPRs provide the Chair, Tom Schneider, (with an information copy to Bill Hammett) a written status update on open issues not later than April 9, 2004 - a reminder notice will be provided.

AERONAUTICAL CHARTING FORUM
INSTRUMENT PROCEDURES GROUP
OPEN AGENDA ITEMS FROM MEETING 04-01

OPR	AGENDA ITEM (ISSUE)	REQUIRED ACTION
AFS-420	**92-02-104** (Precipitous Terrain Adjustments)	Track program and report.
AFS-420	**92-02-105** (Circling Areas)	Review test parameters and send request to AFS-440 to conduct ASAT testing.
AFS-410	**92-02-110** (Cold Weather Altimetry)	Work issue and report.
AFS-410	**96-01-166** (Descent Point on Flyby Waypoints. Originally "on course")	Develop AIM language to resolve the issue and report.
AFS-200	**98-01-197** (Air Carrier Compliance W/Climb Gradients)	AFS-200: Follow up on 1998 ALPA letter to AGC.
AFS-410 AVN-503	**98-01-199** (RVR Accuracy vs. Flight Visibility - Also Use of RVR Minima)	AFS-410: Monitor AIM change. AVN-503: Coordinate TPP legend change.
ACF-IPG Chair ATP-120 AFS-420	**00-02-229** (Turbine Powered Holding)	ACF-IPG Chair: Follow up ATP-120 inaction. ATP-120: Provide written position to AFS. AFS-420: Revise Order 7130.3.
AVN-101 ATP-120 AFS-410	**01-01-234** (Designation of Maximum Altitudes in the Final Approach Segment)	AVN-101: Amend VOR/DME RWY 7 SIAP. ATP-120: Develop PCG changes (AFS-410 to follow up).
AFS-420 ATP-500	**02-01-238** (Departure Minimums and DP NOTAMs)	Provide DCP material to ATP-320 for DP NOTAMs. ATP-500: Coordinate FDC STAR NOTAMs within AAT.
AVN-101	**02-01-239** (MVA Obstacle Accountability and Lack of DVA Criteria)	Monitor development of MVAC automation tool and report.
ATP-120	**02-01-241** (Non-radar Level and Climbing Holding Patterns)	Develop controller education material on the issue.
AFS-420	**02-01-243** (RNAV Holding Pattern Definition)	Address NBAA concerns regarding advanced FMS holding.
ATP-500 & ATP-120	**02-02-246** (Turn Angle Limits for RNAV SIAPs Without TAAs)	Develop controller procedures for "direct-to" RNAV clearances.
AFS-440	**03-01-247** (Holding Pattern Criteria Selection)	Conduct ASAT/simulator analysis and report.

AFS-410	**03-01-248** (Substitution of GPS for Missed Approach Operations)	Continue research on the issue and report
AFS-420 AVN-503 & Jeppesen	**04-01-249** (RNAV Terminal Routes for ILS Approaches)	AFS-420: Consider proposal for combined RNAV Order. AVN-503 & Jeppesen: Research coding feasibility.
AFS-420	**04-01-250** (RNP and Climb Gradient Missed Approach procedures)	Study issue and report.
AFS-420	**04-01-253** (LNAV/VNAV Landing Minimums)	Review guidance in Order 8260.19.
AFS-420	**04-01-255** (Rounding of HAT Values for LPV and RNP Procedures)	Review issue and report.

AERONAUTICAL CHARTING FORUM
INSTRUMENT PROCEDURES GROUP
ATTENDANCE LISTING - MEETING 04-01

Becker	Hal	AOPA	703-560-3588 FAX: 5159	hal.becker@aopa.org
Bergner	Steve	NBAA	845-583-5152 FAX:5769	sbergner1@cs.com
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Canter *	Ronald	FAA/AVN-512	301-713-2958 Ext 124	ronald.l.canter@faa.gov
Chirasello	Vincent	FAA/AFS-410	202-385-4615	vincent.chirasello@faa.gov
Cloutier	Pascale	Canada DND	613-992-7736	cloutier.phcc@forces.gc.ca
Comstock	Kevin	ALPA	703-689-4176 FAX:4370	comstockk@alpa.org
Ewing	Paul	ATP-500 (AMTI)		paul.ctr.ewing@faa.gov
Flood	Frank	Air Canada	905-676-4300 Ext 6430	frank.flood @aircanada.ca
Formosa	Jeffrey	MITRE	703-883-6937 FAX:6608	jformosa@mitre.org
Foster	Mike	USAASA	703-806-4869	fosterja@belvoir.army mil
Fullmer	Rick	12 OG/AIS	210-652-6047 FAX: 3936	kenneth.fullmer@randolph.af.mil
Gaillard	Christian	NAVCANADA	613-563-5909	gaillac@navcanada.ca
Hammett	Bill	FAA/AFS-420 (ISI)	860-399-9407 FAX: 1834	isiconn@comcast.net
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Ingram	John	NGA/PVAI	314-263-4806	ingramjr@nga.mil
Jones	Kevin	SWA		klj@mac.com
Kenagy	Randy	AOPA		
Massimini	Vince	MITRE	703-883-5893 FAX: 1364	svm@mitre.org
Moore	John	FAA/AVN-503	301-713-2631 FAX: 1960	john.a.moore@faa.gov
Ostronic *	Jerry	FAA/AFS-200	202-493-7602	jerry.c.ostronic@faa.gov
Pray	Gregory	FAA/ATA-110	202-267-9292	gregory.ctr.pray@faa.gov
Riley	Mike	NGA/MSF	703-264-3003 FAX: 3133	rileym@nga.mil
Rush	Brad	FAA/AVN-101	405-954-3027 FAX: 4236	brad.w.rush@faa.gov
Santellia	Carol	FAA/ATA-110	202-267-9276	carol.santellia@faa.gov
Schneider	Tom	FAA/AFS-420	405-954-5852 FAX: 2528	thomas.e.schneider@faa.gov

AERONAUTICAL CHARTING FORUM
INSTRUMENT PROCEDURES GROUP
ATTENDANCE LISTING - MEETING 04-01

Stedman	Sandy	Jeppesen	303-328-4580 FAX: 4123	sandy.stedman@jeppesen.com
Steinbecker	Mark	FAA/AFS-410	202-385-4613	mark.steinbecker@faa.gov
Struyk	Jeffrey	NGA/PVAI	314-263-4272	struykjc@nga.mil
Thompson	Ted	Jeppesen	303-328-4456 FAX: 4123	ted.thompson@jeppesen.com
Villemaire	Marie Julie	Transport Canada	613-998-2565	villemj@tc.gc.ca
Ward **	Edward	Southwest Airlines	214-792-1023	edward.ward@wnco.com
* Monday Only				
** Tuesday Only				

Multiple Approach Indicators
(Duplicate Procedure Titles)

FAA/Industry Aeronautical Charting Forum

Herndon, Virginia

April 26 - 29, 2004

Sandy Stedman

JEPPESEN

Goals

- Provide background on multiple approaches
- Talk about the database-related issues
- Propose a solution

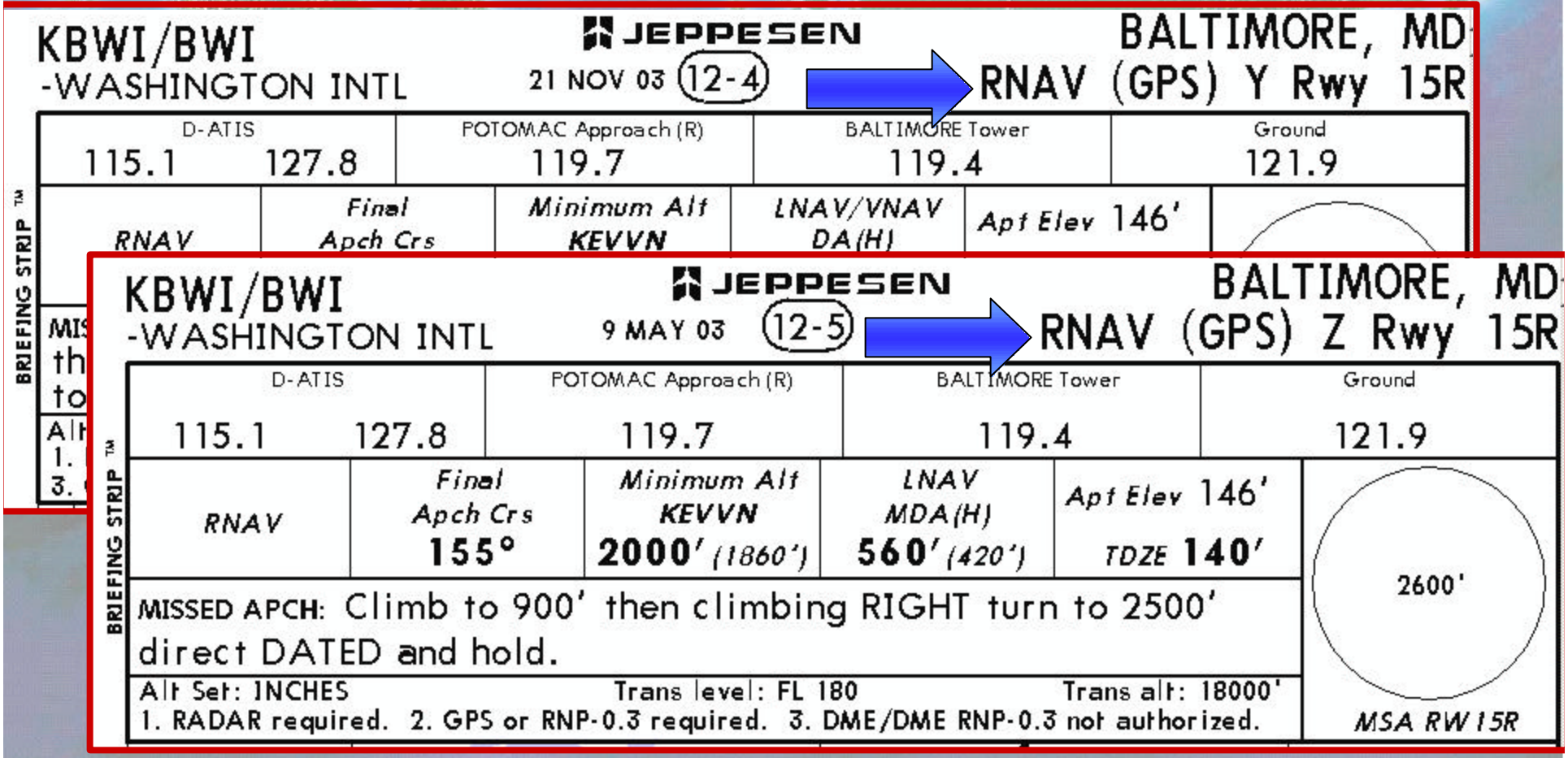
Background

- Traditionally, databases and avionics could not accept two approach procedures with the same identifier to the same runway
- Issue gained visibility as multiple RNAV (GPS) procedures were published to the same runway – for example, one with and one without VNAV
- It became difficult for pilots and ATC to communicate clearly about which procedure was to be used

Initial Solution

- FAA and ICAO established criteria to place unique letter after navaid or sensor type beginning with “Z” and proceeding backwards through the alphabet
- This multiple approach identifier was intended to be used only when the ground track differed between the procedures
- Process applied to both RNAV(GPS) and conventional procedures

RNAV (GPS) Approach Duplication



KBWI/BWI
-WASHINGTON INTL

JEPPESEN
21 NOV 03 (12-4)

BALTIMORE, MD
RNAV (GPS) Y Rwy 15R

D-ATIS	POTOMAC Approach (R)	BALTIMORE Tower	Ground
115.1 127.8	119.7	119.4	121.9

RNAV	Final Apch Crs	Minimum Alt KEVVN	LNAV/VNAV DA(H)	Apt Elev 146'

BRIEFING STRIP ™

KBWI/BWI
-WASHINGTON INTL

JEPPESEN
9 MAY 03 (12-5)

BALTIMORE, MD
RNAV (GPS) Z Rwy 15R

D-ATIS	POTOMAC Approach (R)	BALTIMORE Tower	Ground
115.1 127.8	119.7	119.4	121.9

RNAV	Final Apch Crs 155°	Minimum Alt KEVVN 2000' (1860')	LNAV MDA(H) 560' (420')	Apt Elev 146' TDZE 140'

MISSED APCH: Climb to 900' then climbing RIGHT turn to 2500' direct DATED and hold.

Alt Set: INCHES Trans level: FL 180 Trans alt: 18000'

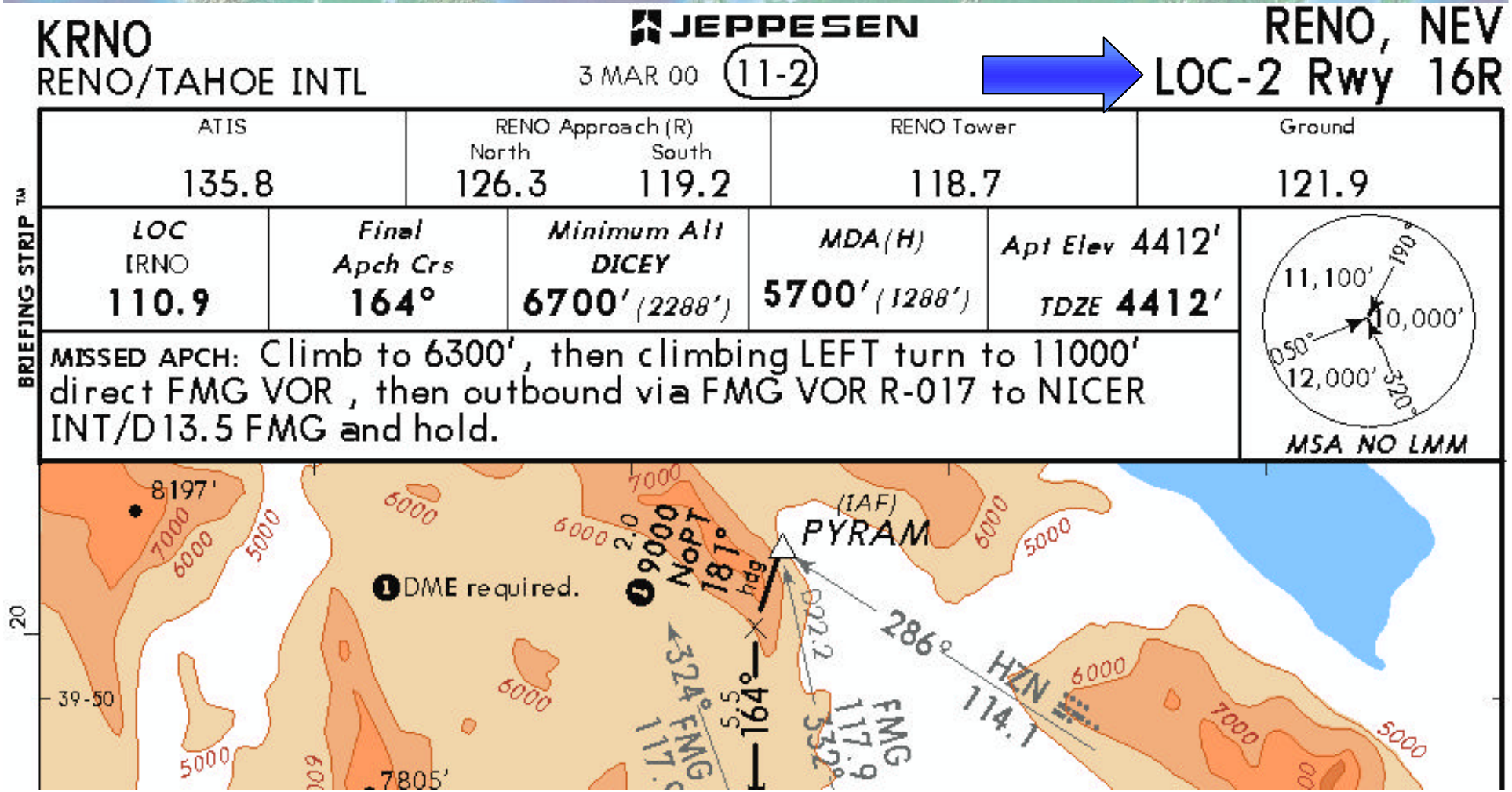
1. RADAR required. 2. GPS or RNP-0.3 required. 3. DME/DME RNP-0.3 not authorized.

2600'

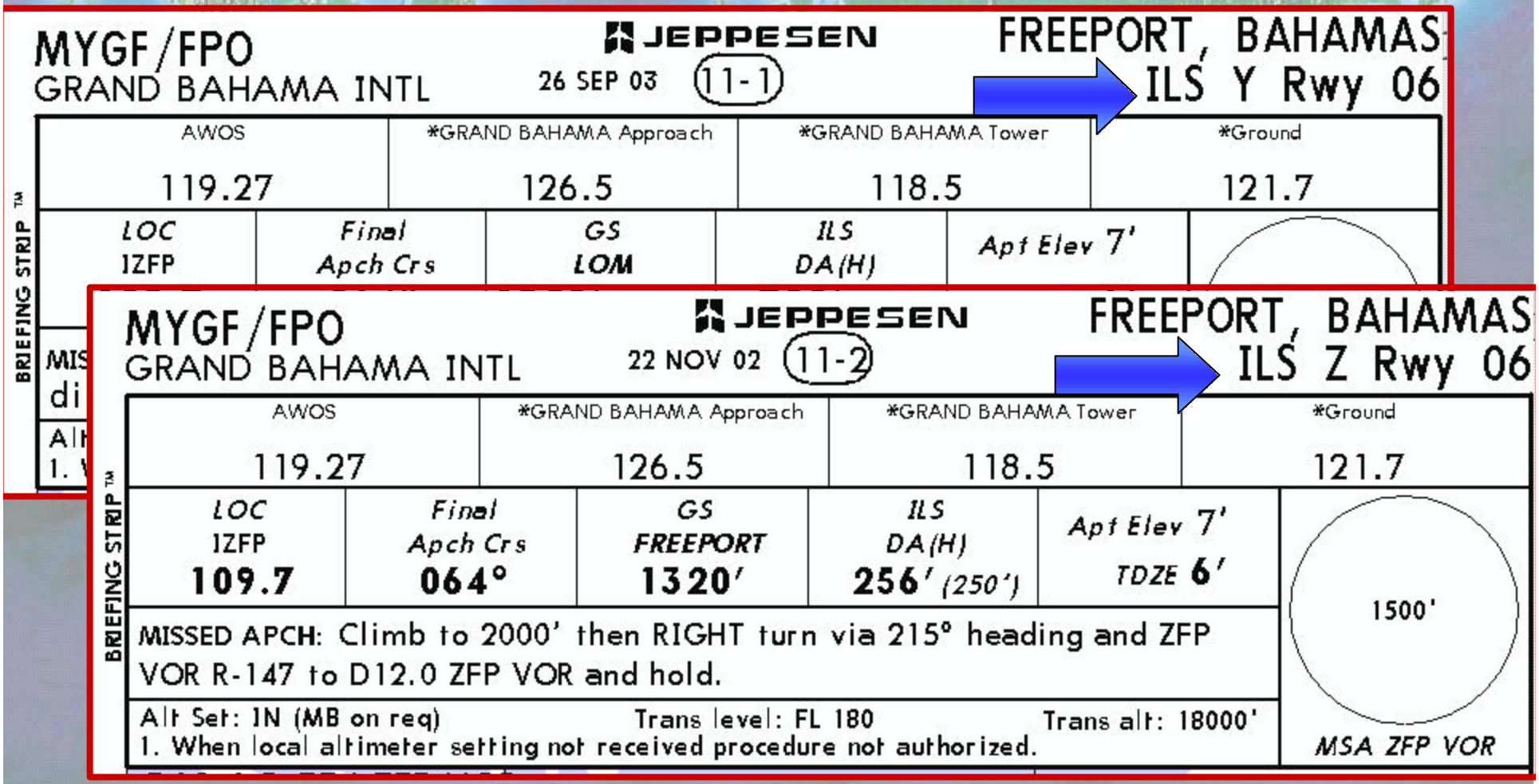
MSA RW 15R

BRIEFING STRIP ™

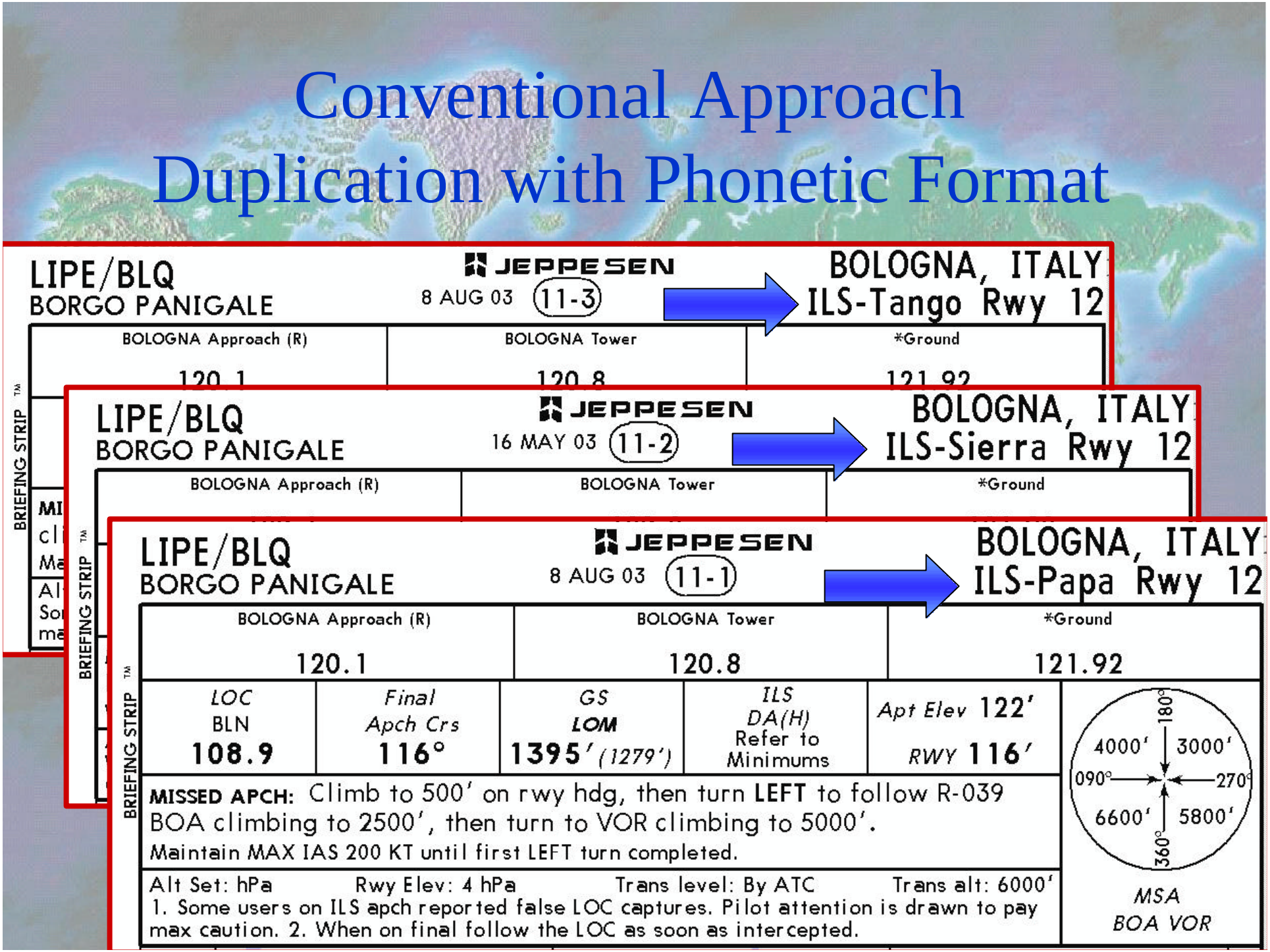
Conventional Approach
Duplication with Number Designator



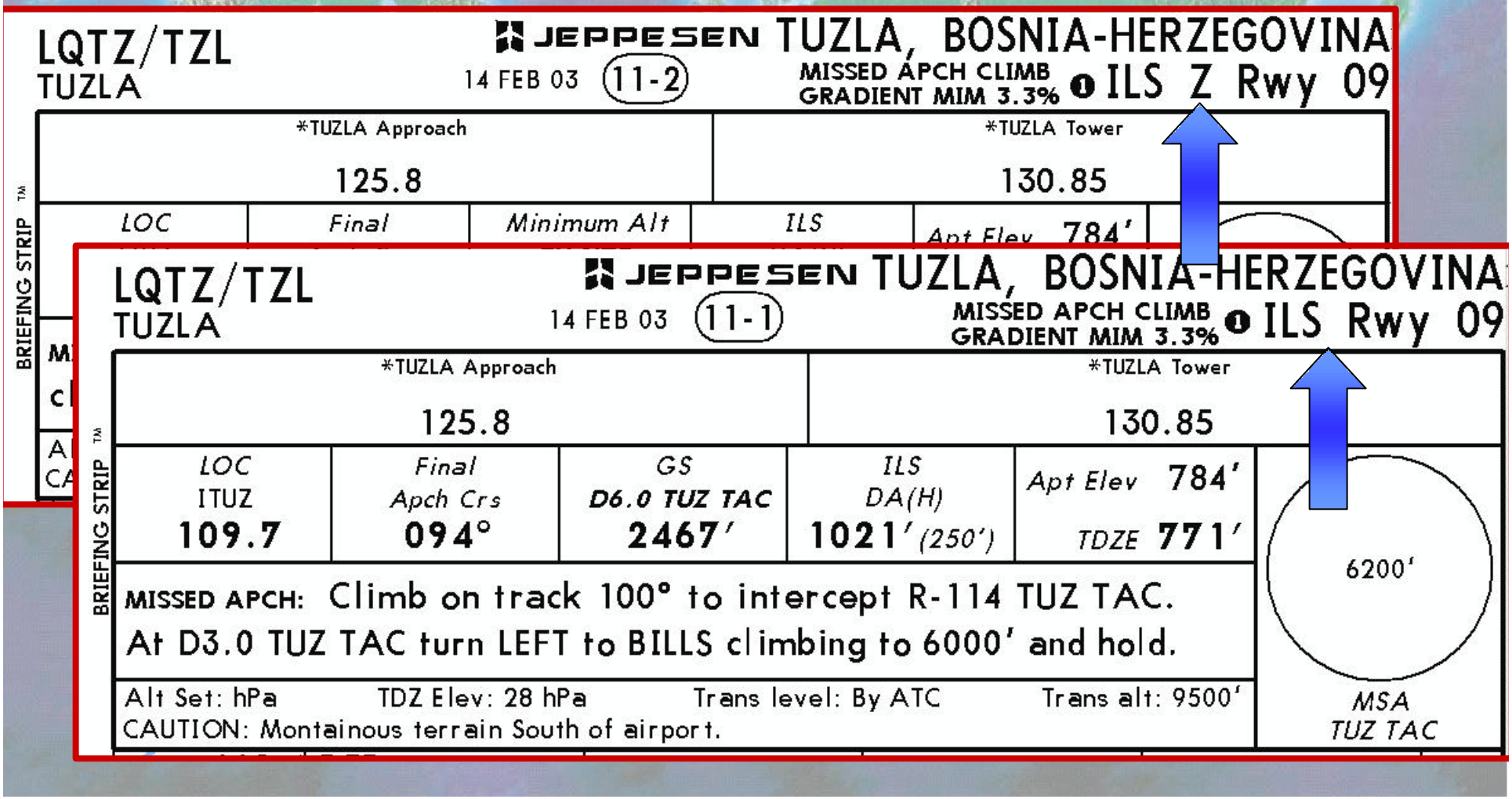
Conventional Approach Duplication with XYZ Format



Conventional Approach Duplication with Phonetic Format



Conventional Approach Duplication with “Blank” and Z Format

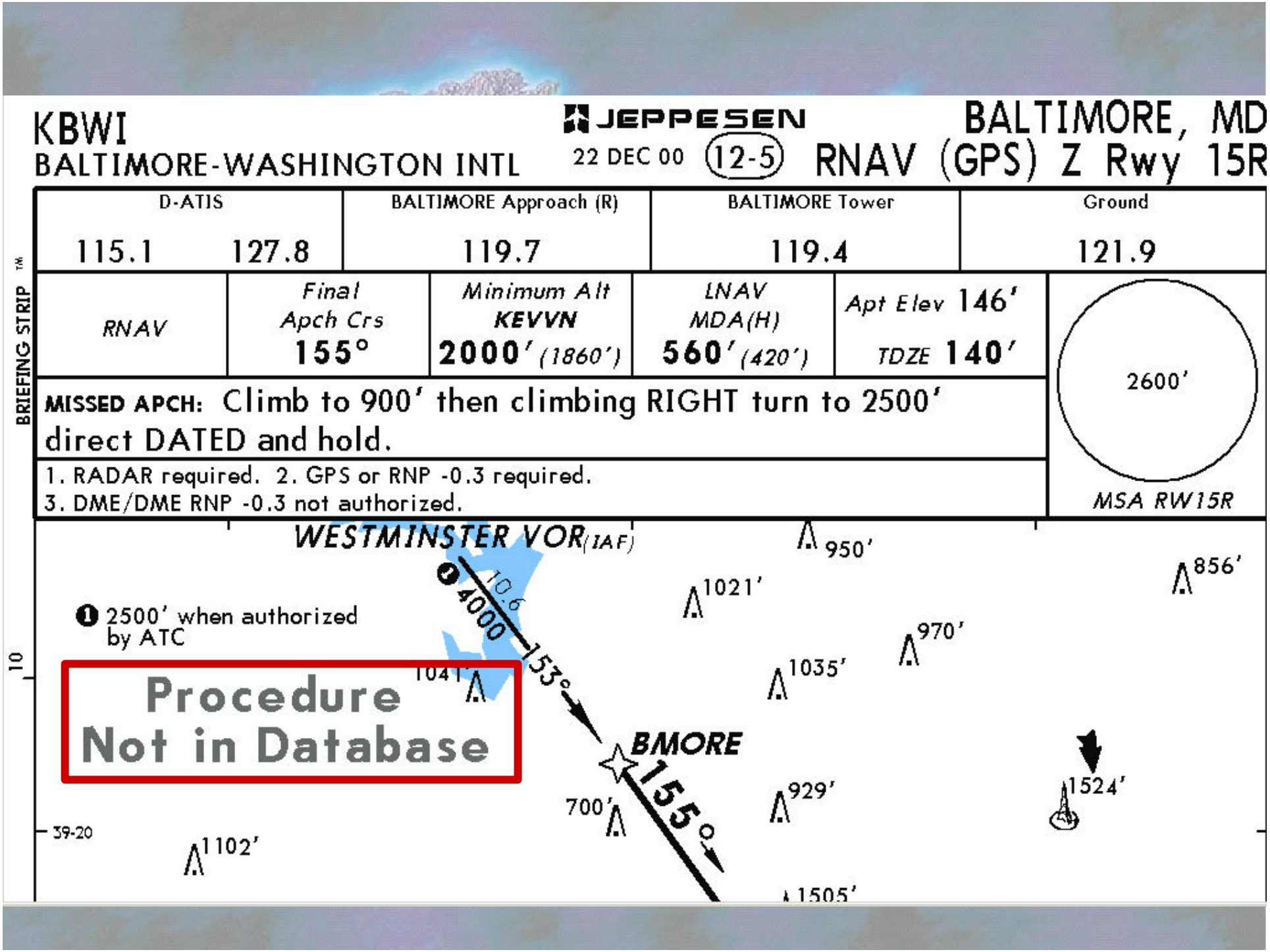


What About the Navigation Display?

- Most avionics do not have an appropriate number of characters available for addition of the multi approach indicator
- Typical nav display for a selected approach:

R N V 0 9 R

- Result: No space for the multi approach indicator, so only one of the procedures can be coded
- Pilot is not sure which procedure is in the database


KBWI
BALTIMORE-WASHINGTON INTL
JEPPESEN
22 DEC 00
12-5
BALTIMORE, MD
RNAV (GPS) Z Rwy 15R
D-ATIS
115.1
127.8
BALTIMORE Approach (R)
119.7
BALTIMORE Tower
119.4
Ground
121.9
BRIEFING STRIP
RNAV
Final Apch Crs 155°
Minimum Alt KEVVN 2000′ (1860′)
LNAV MDA(H) 560′ (420′)
Apt Elev 146′
TDZE 140′
2600′
MISSED APCH: Climb to 900′ then climbing RIGHT turn to 2500′ direct DATED and hold.
1. RADAR required. 2. GPS or RNP -0.3 required.
3. DME/DME RNP -0.3 not authorized.
MSA RW15R
WESTMINSTER VOR (IAF)
10.6
4000
153°
2500′ when authorized by ATC
Procedure Not in Database
BMORE
155°
950′
1021′
856′
970′
1041′
1035′
1524′
929′
700′
1102′
1505′
39-20
10

Recent Developments

- Advances in avionics have made implementation of the multi code indicator desirable
- Both FAA and avionics manufacturers are encouraging implementation so all procedures are available in the database
- Announced this change at October ATA RNAV FMS Task Force and sent out 120 Day Notice

JEPPESEN®
NavData

NOTICE NOTICE NOTICE NOTICE NOTICE NOTICE

Implementation of Multiple Approach Procedure Indicators

November 5, 2003

Beginning in update cycle 0402, multiple approaches of the same type to the same runway will become available in ARINC 424 NavData from Jeppesen. A "multiple indicator" will be added in the Approach Record (PF) to discretely identify the multiple. The new output will be available as an option. If you select the new option you will receive the multiple approaches with a multiple indicator. **Systems and processes that are not able to handle the new output** can continue to receive data in the current format, but **approaches that have a multiple will drop out of the data you receive.** Referring to the examples on page three of this Notice, the new multiple approach option will cause both RNAV (GPS) Y Rwy 22L and RNAV (GPS) Z Rwy 22L to be included in the data. The current output option will cause both approaches to be excluded.

BACKGROUND

Government aeronautical authorities sometimes publish more than one approach procedure of a given type to the same runway. Currently, only one of the procedures can be captured in the Jeppesen Aviation Database (JAD) and delivered to avionics systems. Since RNAV (GPS) procedures must be retrieved from a database to be legally flown, the procedures not coded in a database are unusable. Therefore, a "Procedure Not In Database" note is placed on the Jeppesen approach chart (see page three of this Notice for example) for the approach not coded. In order to make multiple approaches of the same type to the same runway available, Jeppesen will begin outputting a "multiple indicator" in approach route identifier coding.

SPECIFICS

Based on ARINC Specification 424, Supplement 16 (ARINC 424-16), section 5.10, the Approach Route Identifier (APPROACH IDENT) field in Approach Records (PF) will be available with a multiple indicator. A government aeronautical authority supplied multiple indicator will be added in the 5th character of the APPROACH IDENT field (column 18 of the PF record) to uniquely identify the multiple. The multiple indicator in the database will correspond with the approach identifier on the Jeppesen chart. Jeppesen will also output a "–"(dash) in the 4th character of the APPROACH IDENT field when no L, R, C or T (for left, right, center or true) exists in that field and there is a multiple indicator in the 5th character.

Relevant excerpts from ARINC 424-16, Section 5.10 are shown on the next page for your reference:

JEPPESEN®
NavData

NOTICE NOTICE NOTICE NOTICE NOTICE NOTICE

Postponement of Approach Multiple Indicator Implementation

December 29, 2003

Jeppesen will postpone its implementation of ARINC 424 approach "multiple indicators" due to industry concerns about adverse impact in some avionics. Approach multiple indicator is the ARINC 424 data enhancement that enables more than one approach of the same type to the same runway. Jeppesen's implementation was announced in a November 5, 2003 NavData Notice. It is being postponed to address concerns, consider options and identify solutions to avoid loss of data or presentation of unclear information in avionics that are unable to handle multiples.

Background

In general, Jeppesen NavData currently contains only one approach of a multiple approach set. Other approaches in a multiple set are not contained in ARINC 424 data. With implementation of multiple indicators, multiple approaches of the same type to the same runway will be added to ARINC 424 data.

Some newer avionics are currently capable of handling multiple approach indicators and multiple approaches. For those that are not, aircraft operators are faced with the potential of losing the one approach they currently have from a multiple set, or receiving a single approach that may not be appropriate for their avionics or operations. The postponement will allow additional time to evaluate options that will better support current avionics limitations.

New Implementation Date to be Announced

A new implementation date will be set after various options can be discussed in industry forums such as the Air Transport Association (ATA) FMS/RNAV Task Force meeting on February 3-5, 2004 in Atlanta. Jeppesen expects to announce a new implementation date late in the first quarter.

If you have questions about this Notice please contact Jeppesen NavData Technical Support at phone (USA) 303-328-4445, e-mail navdatatechsupport@jeppesen.com, or fax (USA) 303-328-4137.

Current Situation

- Some newer avionics can handle multiple approach codes – For them, NO PROBLEM with addition of the code
- Majority of airline fleet has avionics that cannot handle multiple approach codes
- Most avionics companies have a mixed capability to handle multiple approach codes

The Challenge

- Enable multiple indicator in avionics capable of handling it so all approaches are available
- Recognize the needs of the majority of the fleet that cannot handle the new multiple indicator
- Meet the on-going industry need to support legacy systems as well as new equipment

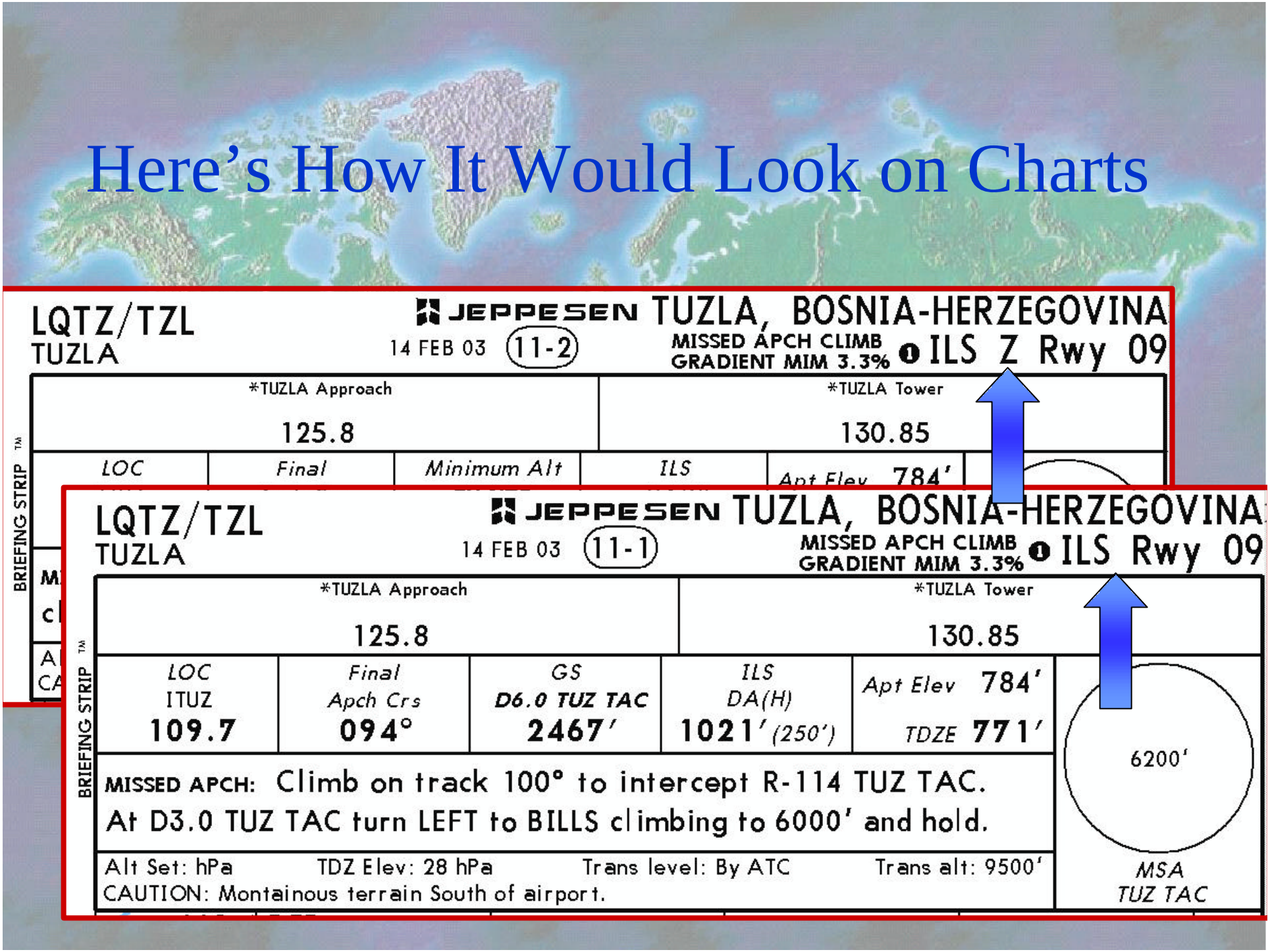
Potential Solutions for Avionics Not Multiple Approach Code Capable

- Data supplier selects a default approach based set of criteria
- FMS database processor selects the default approach for the avionics
- Propose ARINC 424 multiple approach categories to help avionics companies select the multiple appropriate for the box
- Government aeronautical authority designates predominant approach
- No multiples

Proposed Solution

- Predominant approach does not utilize suffix (XYZ indicator field is blank)
- Second, third, etc. approaches utilize the XYZ identifier field
- Predominant approach is designated by State
- State's procedure designer uses criteria for "predominant" approach such as:
  - Lowest minimums
  - If non-precision, approach with vertical angle
  - Approach used most often by ATC

Here's How It Would Look on Charts



Here's How It Might Look on a Legacy Nav Display

- Predominant approach –

I L S 0 9 —

Here's How It Might Look on a New Generation Nav Display

- Predominant approach

I L S _ 0 9 _

- Z-Designated approach

I L S Z 0 9 _

Result of Proposed Solution

- All multiple approaches are in the database
- For those with newer avionics, database identifiers and chart procedure titles are in alignment
- Pilots using nav systems that cannot accommodate multiples receive the predominant approach and clearly understand that the charted procedure without a suffix is the procedure in their database

One Final Issue: Terms Like "Converging" Still Cannot Be Translated to Database Codes

KDFW/DFW
DALLAS-FT WORTH INTL

JEPPESEN 17 JAN 03 (61-8) Eff 23 Jan

DALLAS-FT WORTH, TEXAS
ILS Y Rwy 18L

BRIEFING STRIP™

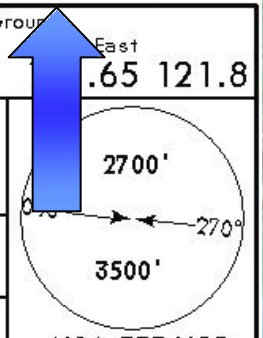
D-ATIS Arrival	REGIONAL Approach (R)	DFW Tower West	DFW Tower East	Ground West	Ground East
123.77	118.42	124.15 134.9	126.55 127.5	121.85	.65 121.8

LOC	Final Apch Crs	GS	ILS DA(H)	
ICIX 110.55	174°	HASTY 2190′	880′ (278′)	Apt Elev 603′ TDZE 18L 602′

MISSED APCH: Climb to 1300′ then climbing RIGHT turn to 5000′ outbound via FUZ VOR R-222 to LIKES INT/D27.0 FUZ.

Alt Set: INCHES Trans level: FL 180 Trans alt: 18000′

1. RADAR required. 2. Simultaneous approach authorized with ILS Rwys 17L/C/R.



KDFW/DFW
DALLAS-FT WORTH INTL

JEPPESEN 17 JAN 03 Eff 23 Jan (61-8-1)

DALLAS-FT WORTH, TEXAS
CONVERGING ILS Y Rwy 18L

BRIEFING STRIP™

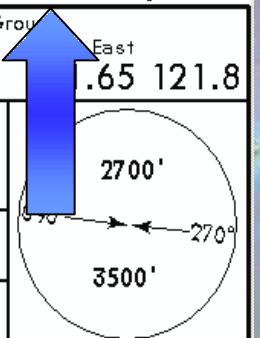
D-ATIS Arrival	REGIONAL Approach (R)	DFW Tower West	DFW Tower East	Ground West	Ground East
123.77	118.42	124.15 134.9	126.55 127.5	121.85	.65 121.8

LOC	Final Apch Crs	GS	ILS DA(H)	
ICIX 110.55	174°	HASTY 2190′	880′ (278′)	Apt Elev 603′ TDZE 602′

MISSED APCH: Climb to 5000′ outbound via TTT VOR R-176 to JASPA INT/D35.0 TTT.

Alt Set: INCHES Trans level: FL 180 Trans alt: 18000′

1. RADAR required. 2. Simultaneous approach authorized with CONVERGING ILS Rwy 13R (Cat I only) and CONVERGING ILS Rwys 17C/R.



Adoption Process

- General agreement at ATA FMS/RNAV Task Force
- Agreement in RAA Technical Committee
- Follow up with FAA/Industry Aeronautical Charting Forum
- Follow up with ICAO OCP

Desired Outcome

- FAA endorsement for this recommended “multiple code indicator” solution
- FAA change in procedure naming policy to align with the new “multiple code indicator” solution where the predominant approach is indicated by a blank designator

Multiple Approach Codes (Duplicate Procedure Titles)

FAA/Industry Aeronautical Charting Forum

Herndon, Virginia

April 26 - 29, 2004

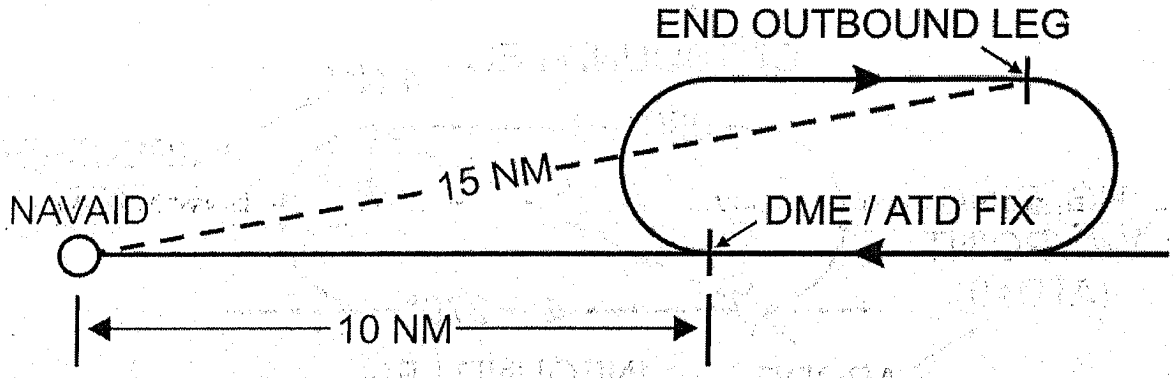
Thanks

JEPPESEN

Change AIM Paragraph 5-3-7, j, 5 (AIP paragraph ENR 1.5, 1.3.2.4) to read:

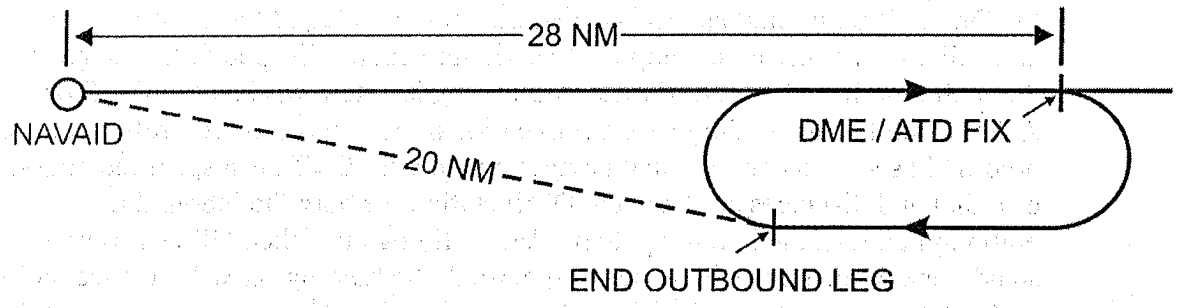
5. Distance Measuring Equipment (DME)/GPS Along Track Distance (ATD). DME/GPS holding is subject to the same entry and holding procedures except that distances (nautical miles) are used in lieu of time values. The outbound course of the DME/GPS holding pattern is called the outbound leg of the pattern. The controller or the instrument approach procedure chart will specify the length of the outbound leg. The end of the outbound leg is determined by the DME or ATD readout. The holding fix on conventional procedures, or controller defined holding based on a conventional navigation aid with DME, is a specified course or radial and distances are from the DME station for both the inbound and outbound ends of the holding pattern. When flying published GPS overlay or standalone procedures with distance specified, the holding fix will be a waypoint in the database and the end of the outbound leg will be determined by the ATD. Some GPS overlay and early stand alone procedures may have timing specified. (See FIG 5-3-5, FIG 5-3-6 and FIG 5-3-7) See paragraph 1-1-20, Global Positioning System (GPS), for requirements and restriction on using GPS for IFR operations.

FIG 5-3-5 (ENR 1.5-4)
Inbound Toward NAVAID



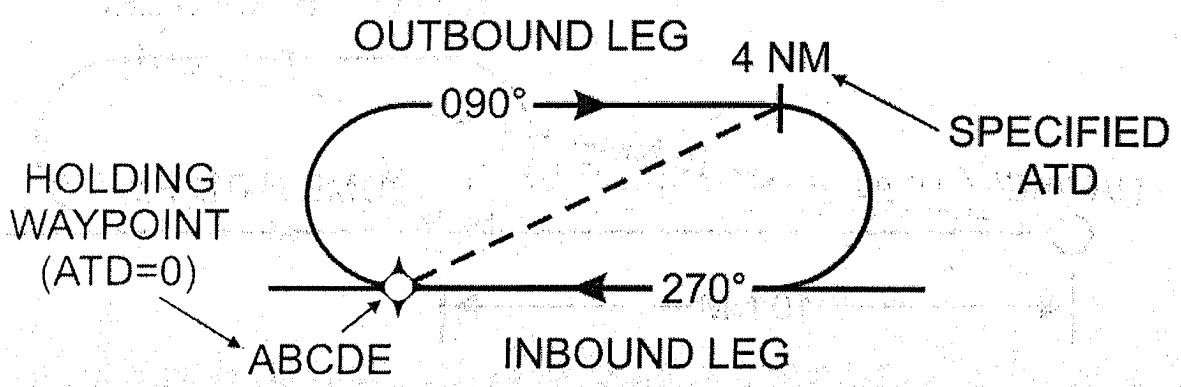
Note-
When the inbound course is toward the NAVAID, the fix distance is 10 NM, and the leg length is 5 NM; then the end of the outbound leg will be reached when the DME/ATD reads 15 NM.

FIG 5-3-6 (ENR 1.5-5)
Inbound leg Away from NAVAID



Note-
When the inbound course is away from the NAVAID and the fix distance is 28 NM, and the leg length is 8 NM, then the end of the outbound leg will be reached when the DME/ATD reads 20 NM.

New FIG 5-3-7 (ENR 1.5-6)
GPS/RNAV Holding



NOTE-
The inbound course is always toward the waypoint and the ATD is zero at the waypoint. The ~~outbound~~ end of the ~~holding pattern~~ outbound leg is reached when the ATD reads the specified distance.

Explanation of change: Clarifies holding using GPS/RNAV under different circumstances.

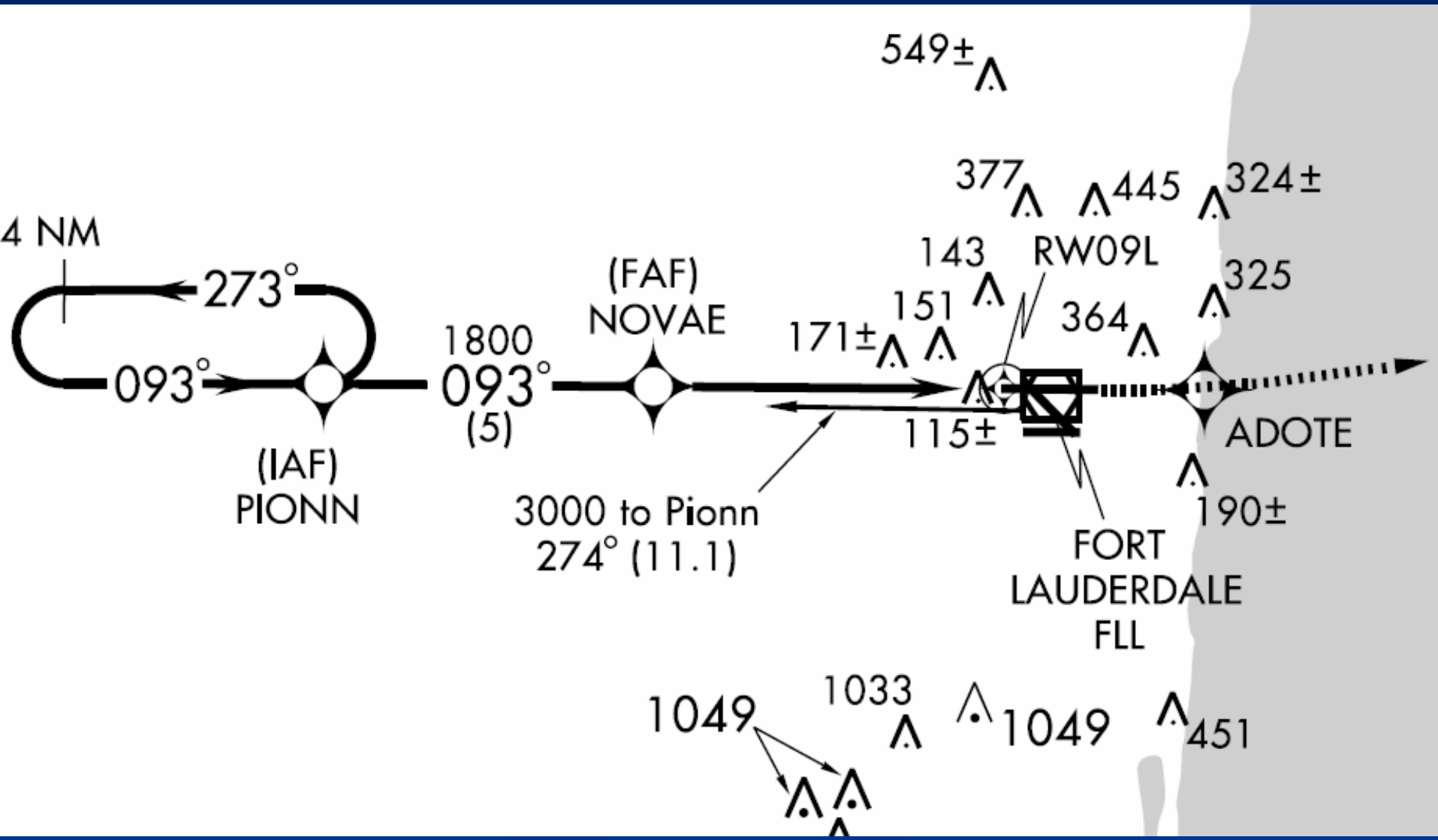
Resolving RNAV Direct-to Confusion

- Clearances Direct-to fixes other than IAF's continue to proliferate.
- Goal is to take advantage of RNAV capability while maintaining IFR safety.
- Policy, Guidance and Charting Specs Require Revision.

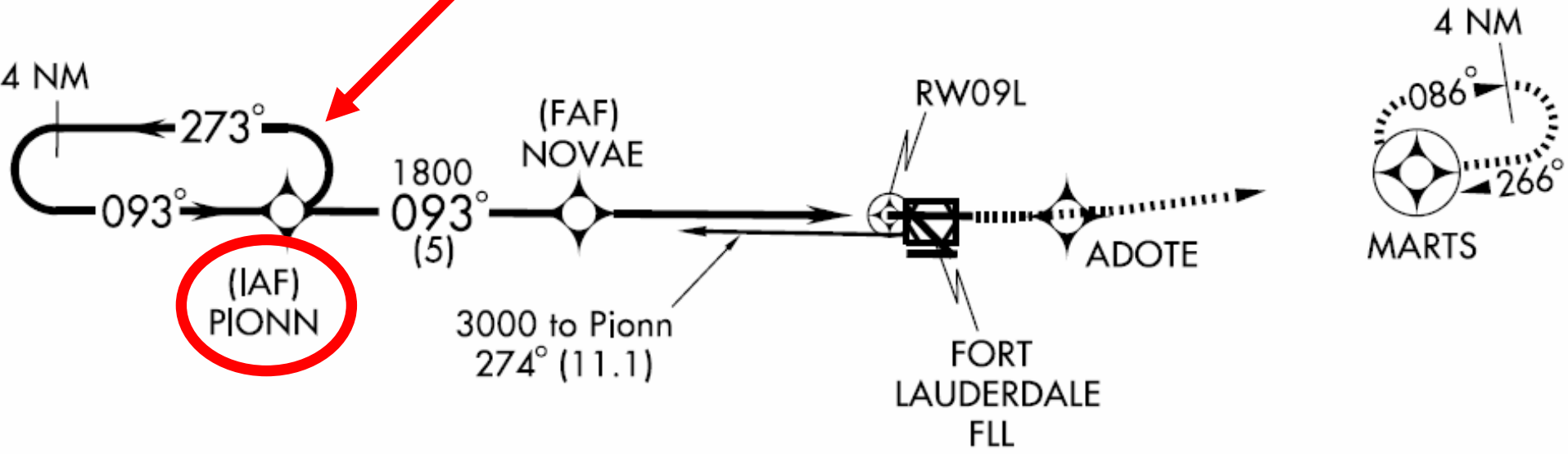
Limitations of Direct-to RNAV must be clearly understood

At 2137:29, AA965 asked Approach, "Can American Airlines Nine Six Five ***go direct to Rozo*** and then do the Rozo arrival sir?"

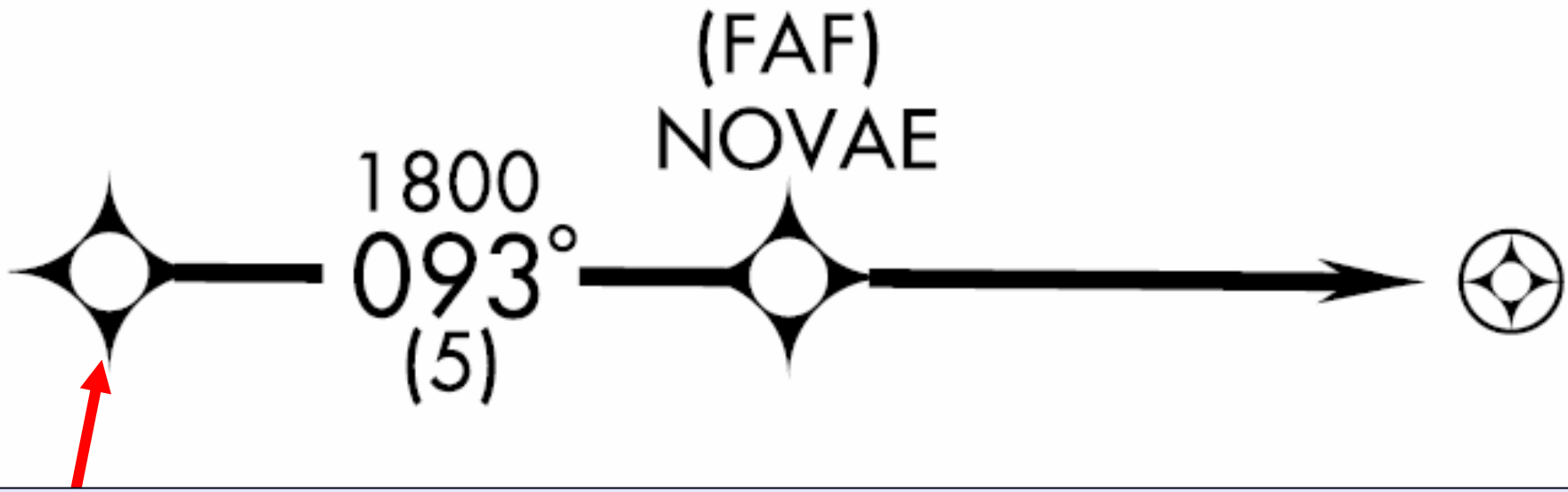
FLL RNAV (GPS) Rwy 9L



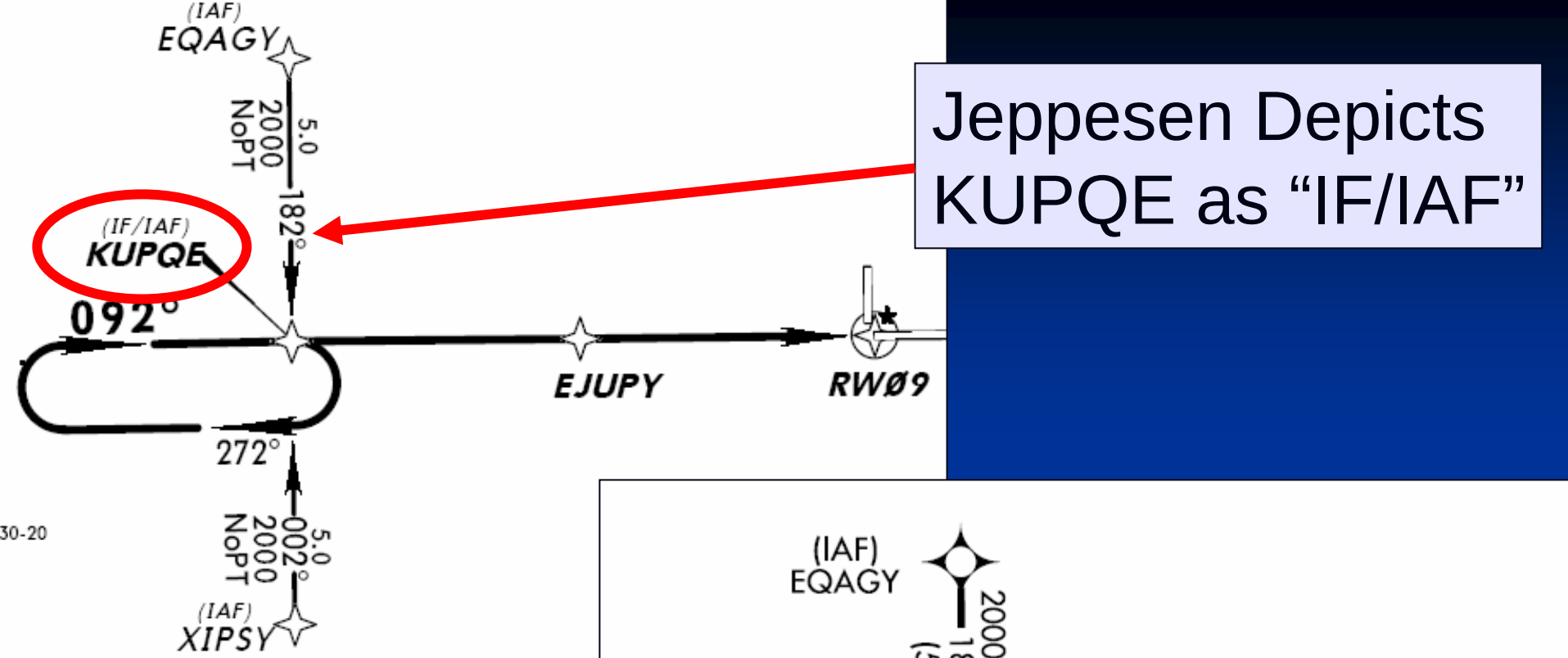
PIONN is an IAF ***only*** when the Hold-in-Lieu racetrack is Flown



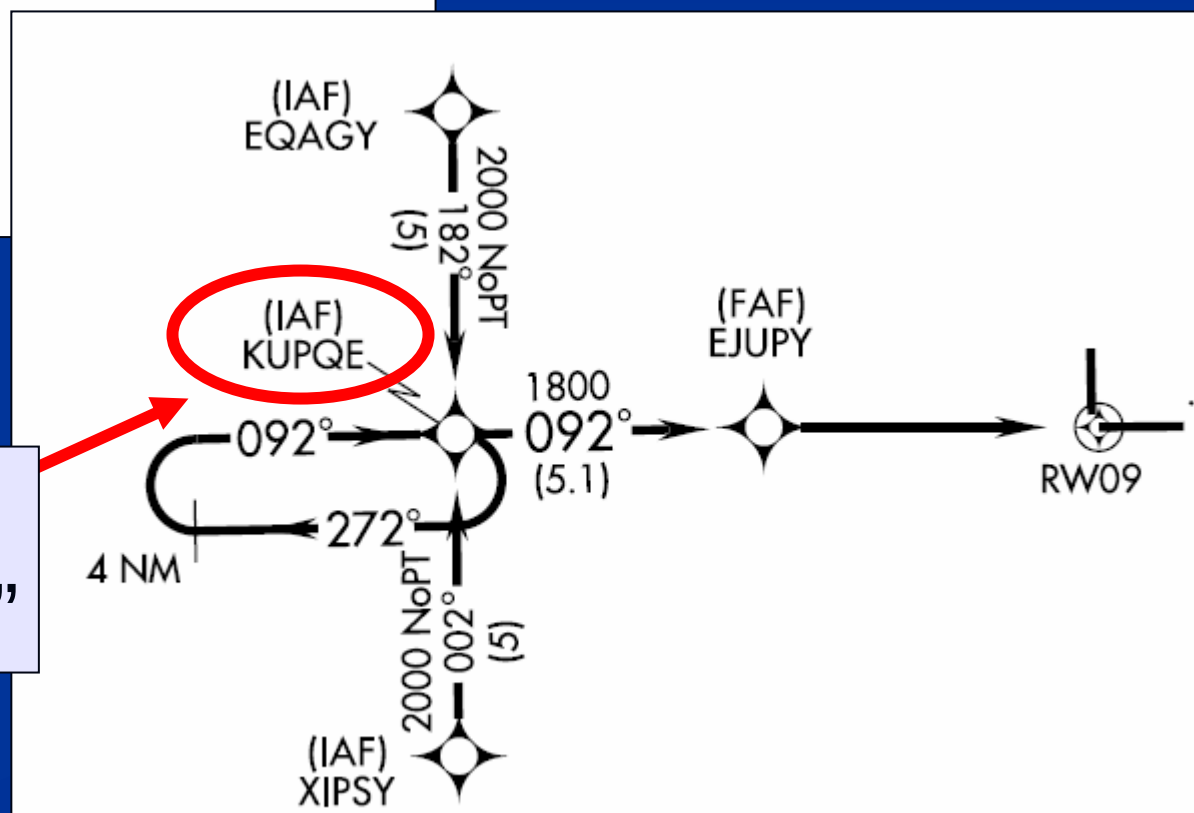
After Hold-in-Lieu Racetrack Is Flown…(or if HIL is *not* flown)



PIONN Becomes
an ***Intermediate Fix*** (IF)

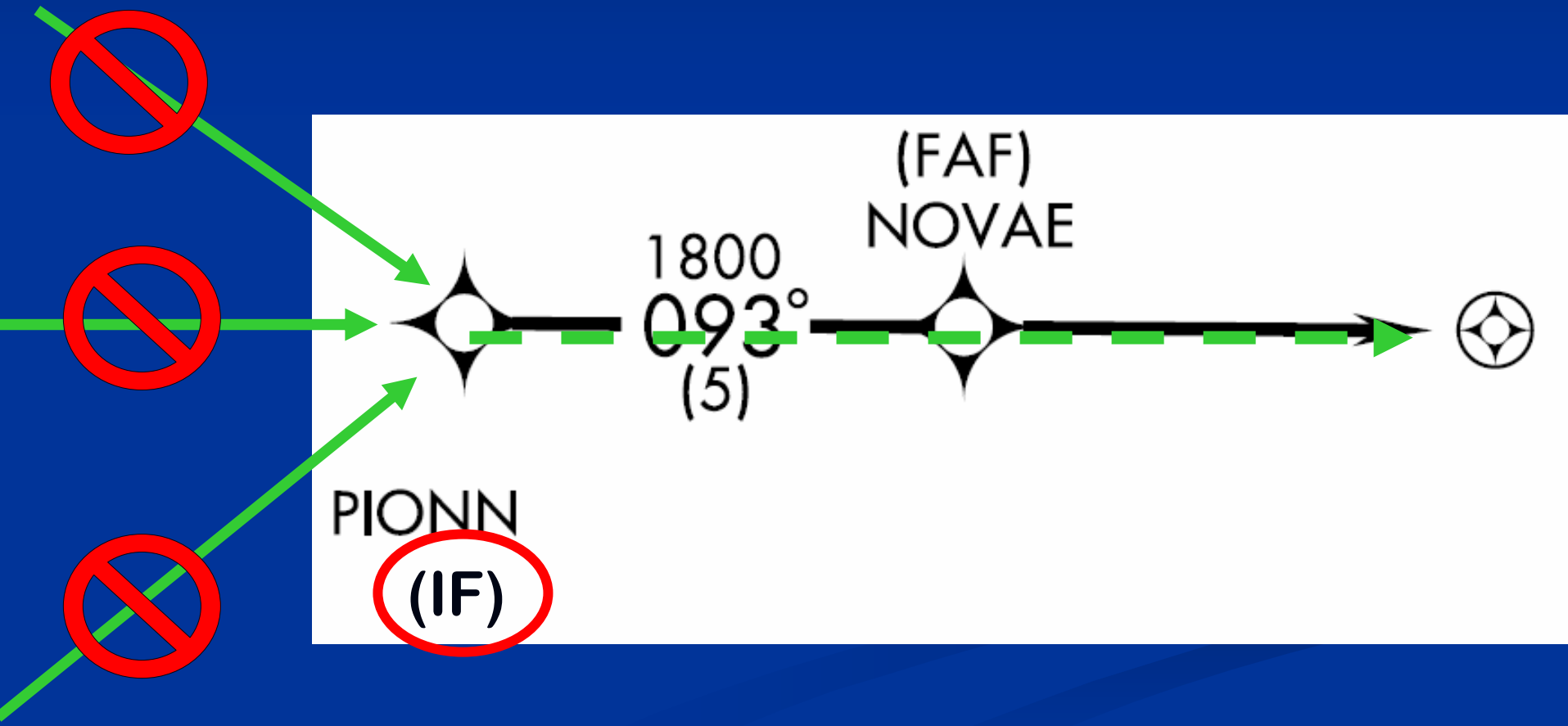


Jeppesen Depicts KUPQE as “IF/IAF”



NACO Depicts KUPQE as “IAF”

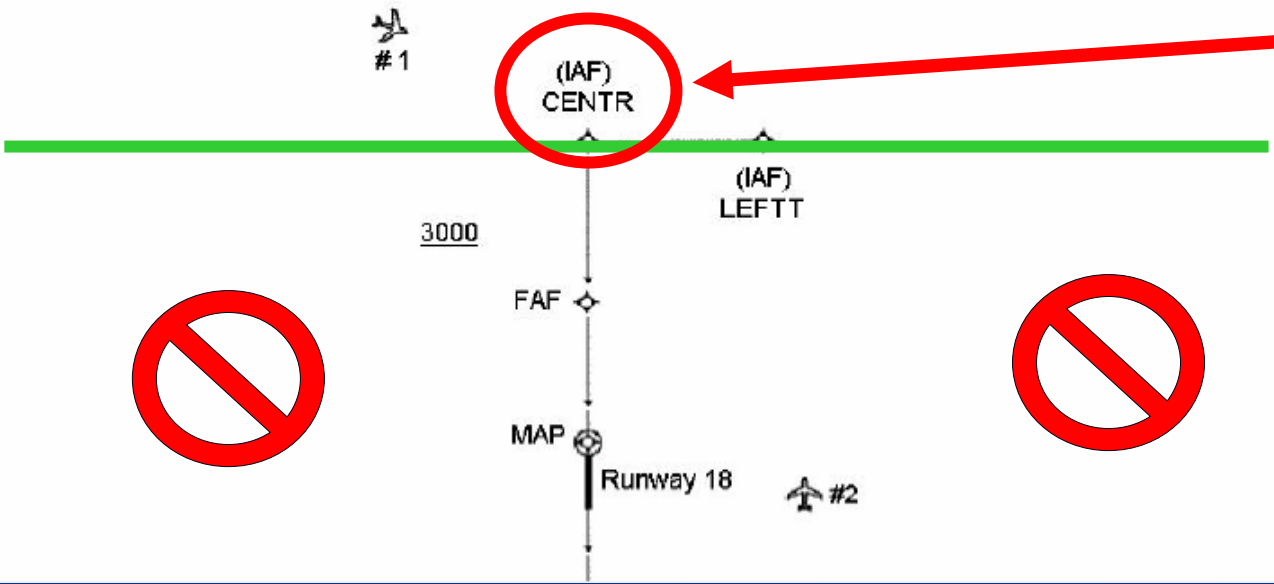
Currently, Direct-to IF Clearances are not permitted



7110.329 Guidance did ***not*** resolve Direct-to IF Confusion

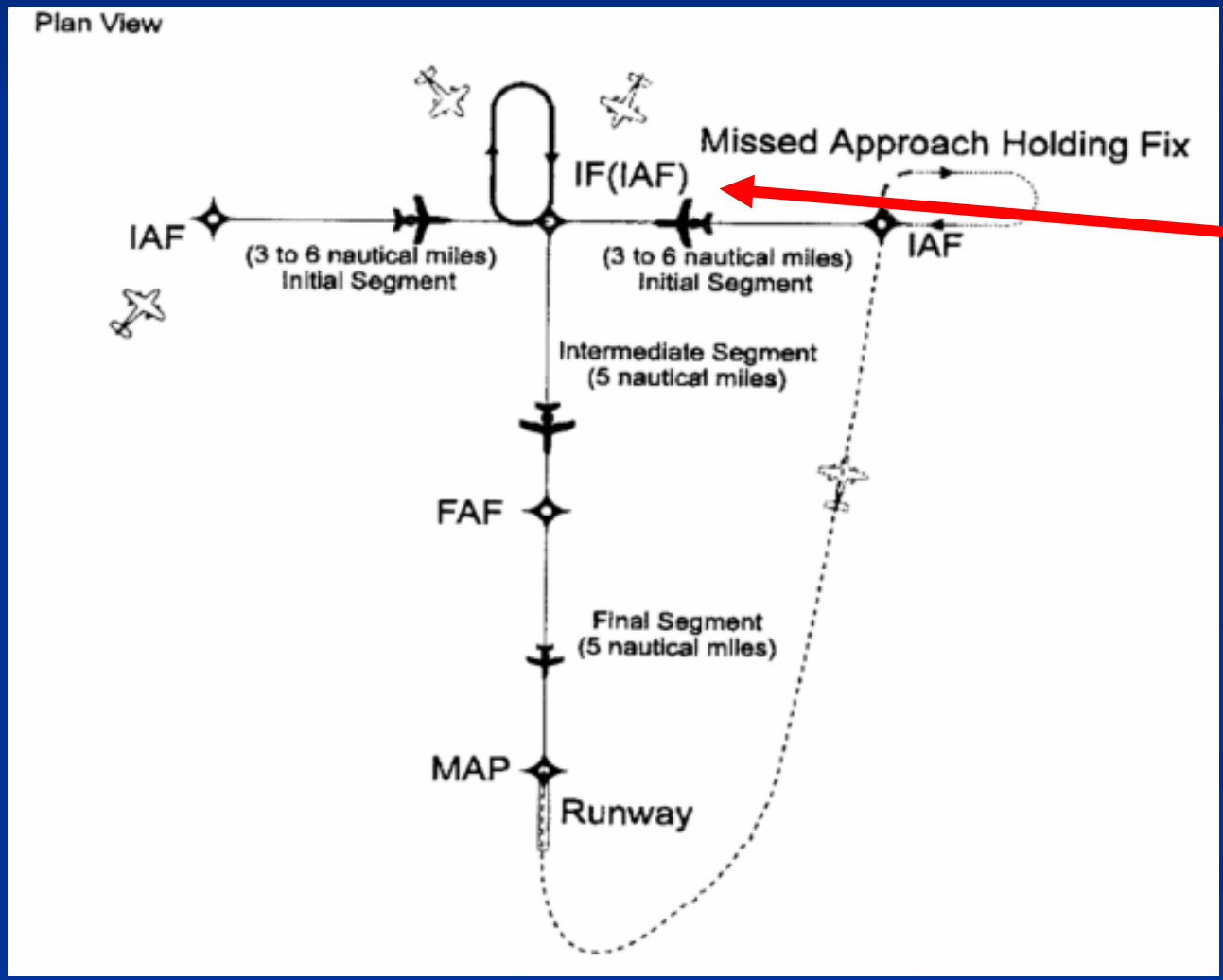
3. Established on a heading or course that will intercept the initial segment at the initial approach fix, or intermediate segment at the intermediate fix when no initial approach fix is published, for a GPS or RNAV instrument approach procedure at an angle not greater than 90 degrees. Angles greater than 90 degrees may be used when a hold in lieu of procedure turn pattern is depicted at the fix for the instrument approach procedure (see figure 4-8-2).

FIG 4-8-2
Approach Clearance Example
For RNAV Aircraft



CENTR is An **IF – *NOT*** an IAF

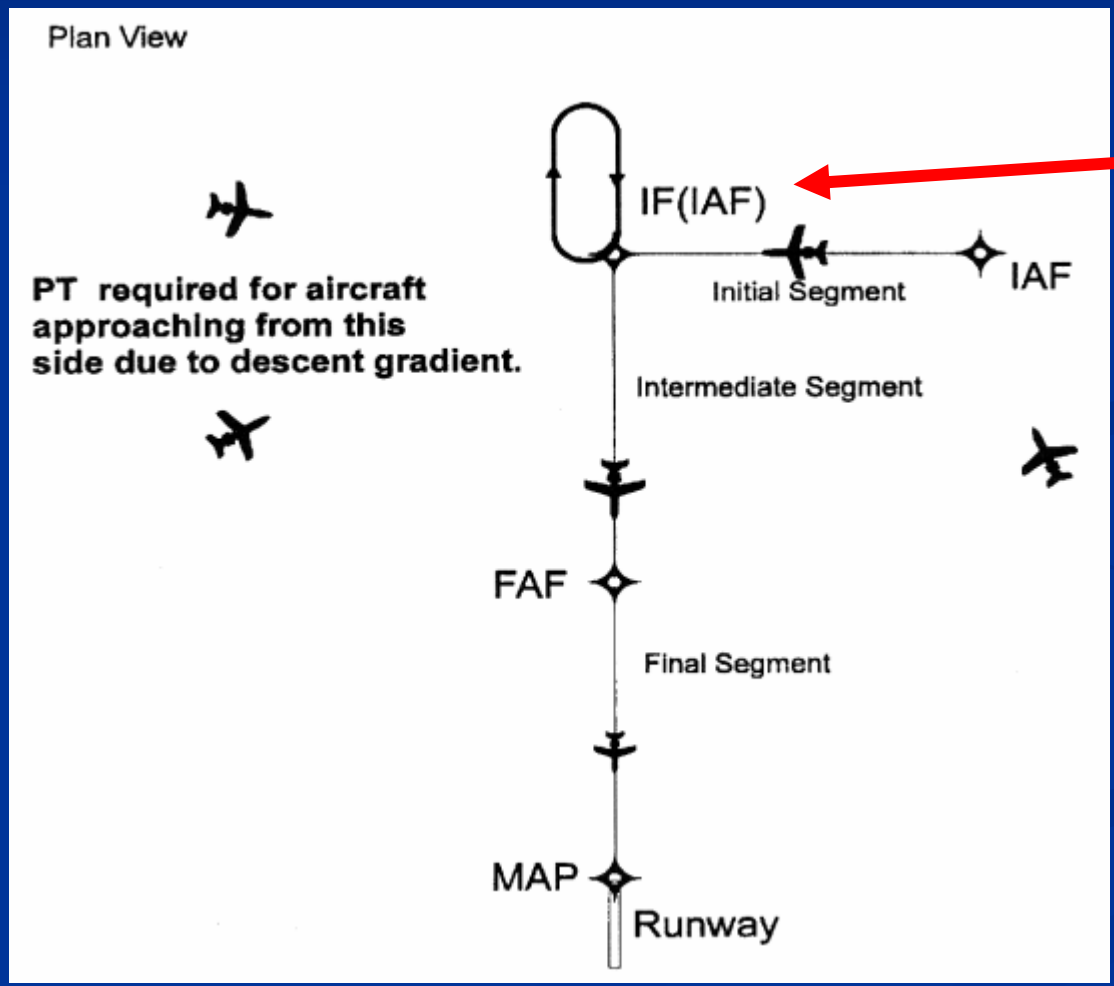
Illustrations in AIM and 7110.65 add to IF/IAF Confusion



Center Waypoint is an IAF ***only*** when HIL is flown

AIM
Fig 5-4-2

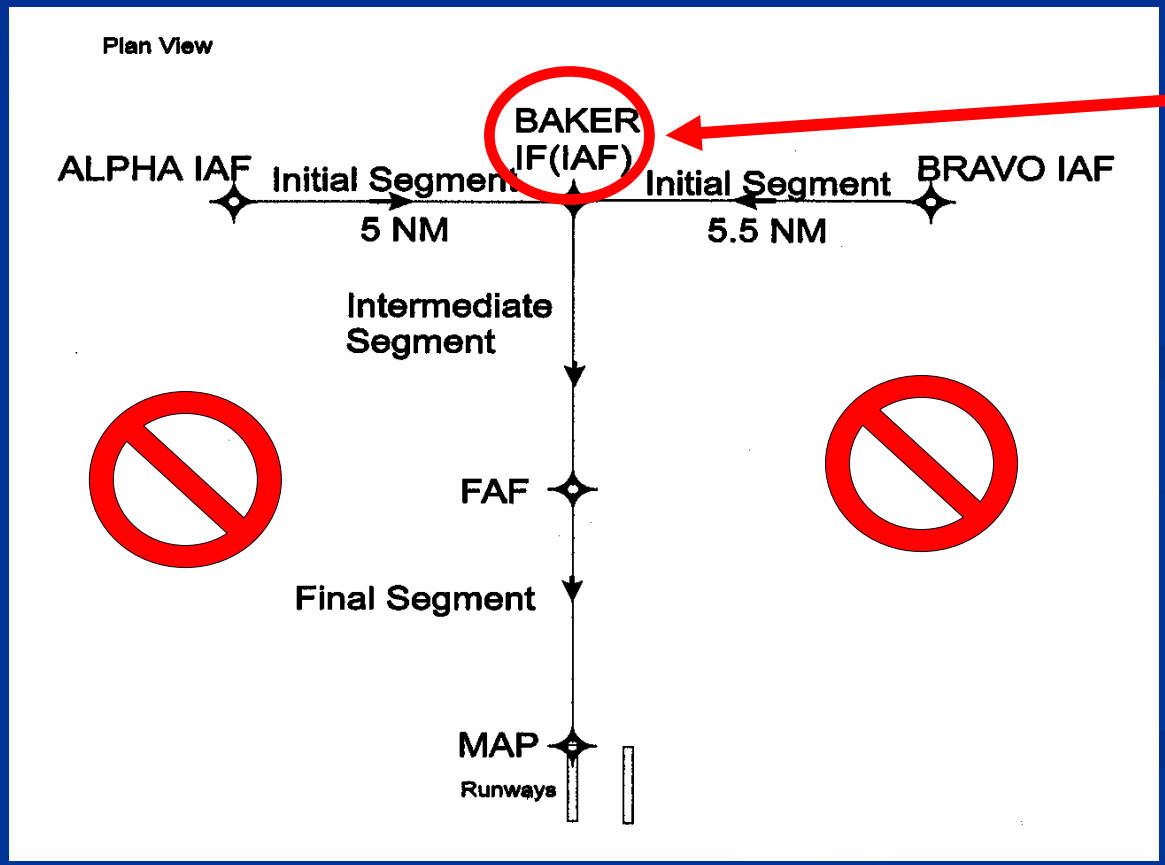
Illustrations in AIM and 7110.65 add to IF/IAF Confusion



Center Waypoint is an IAF ***only*** when HIL is flown

AIM
Fig 5-4-3

Illustrations in AIM and 7110.65 add to IF/IAF Confusion

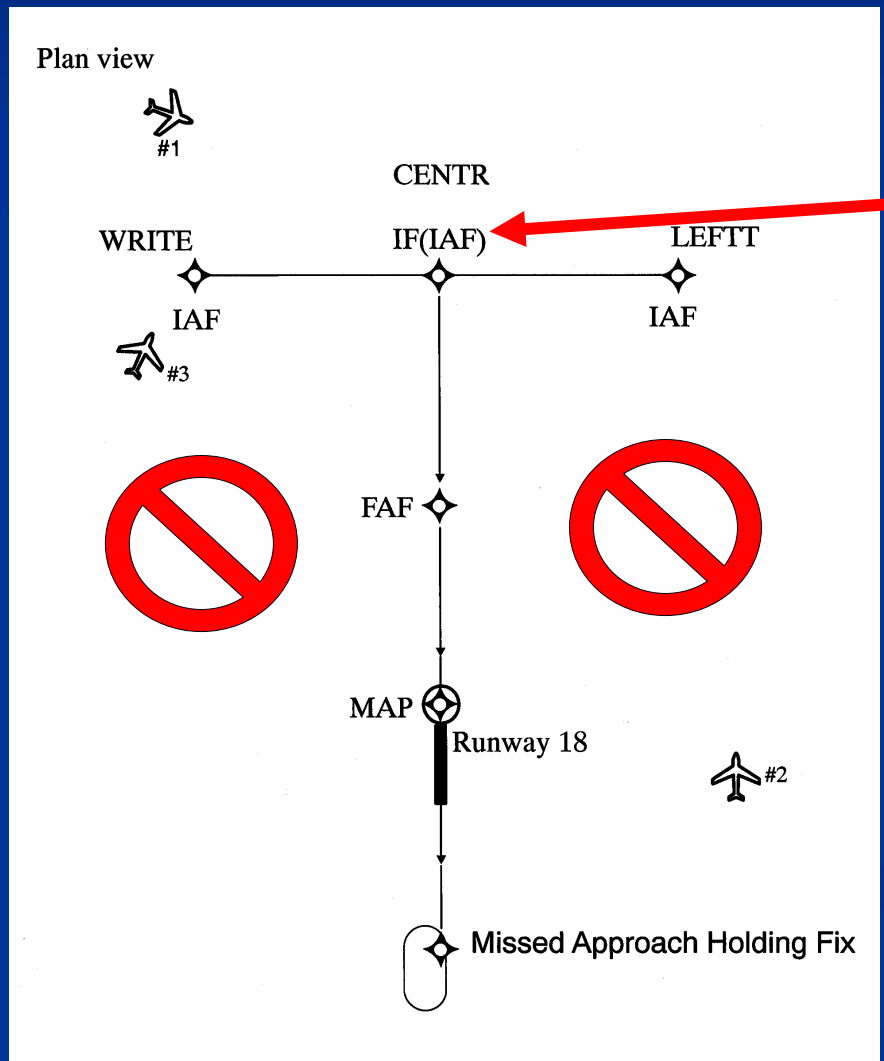


Center Waypoint is ***NOT*** an IAF

There is no HIL

AIM
Fig 5-4-6

Illustrations in AIM and 7110.65 add to IF/IAF Confusion

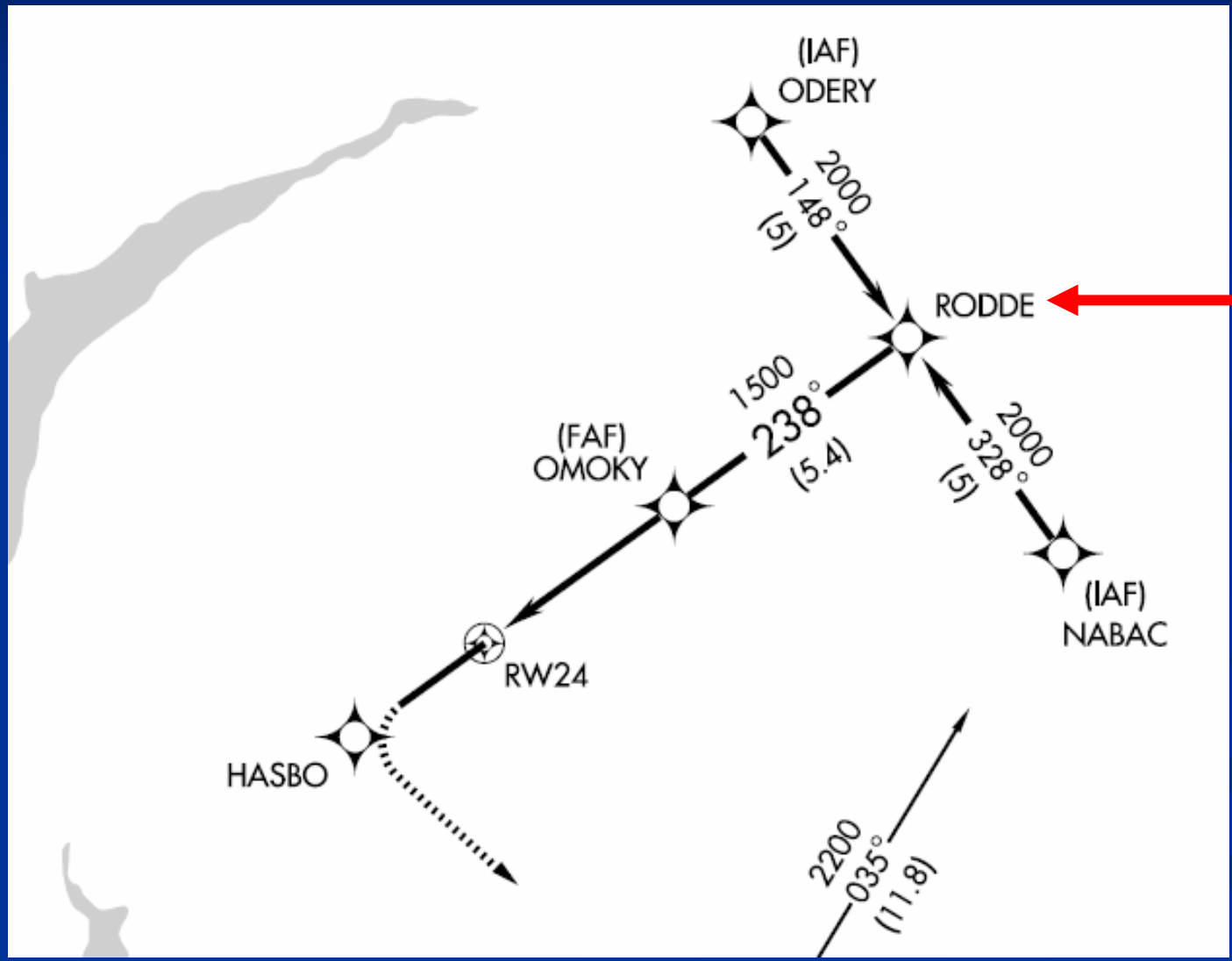


Center Waypoint is ***NOT*** an IAF

There is no HIL

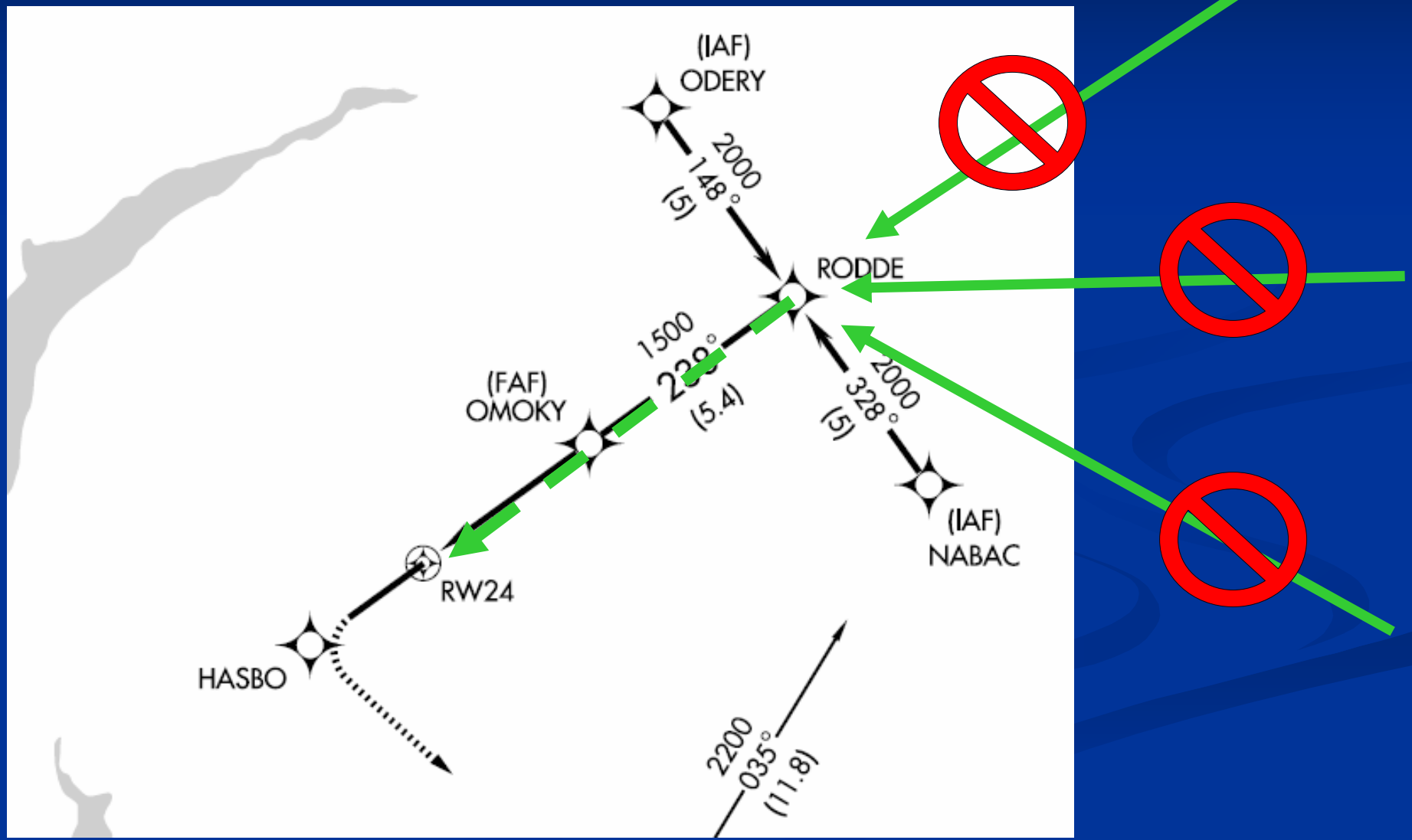
7110.65P
Figure 5-9-5

RSW RNAV (GPS) Rwy 24

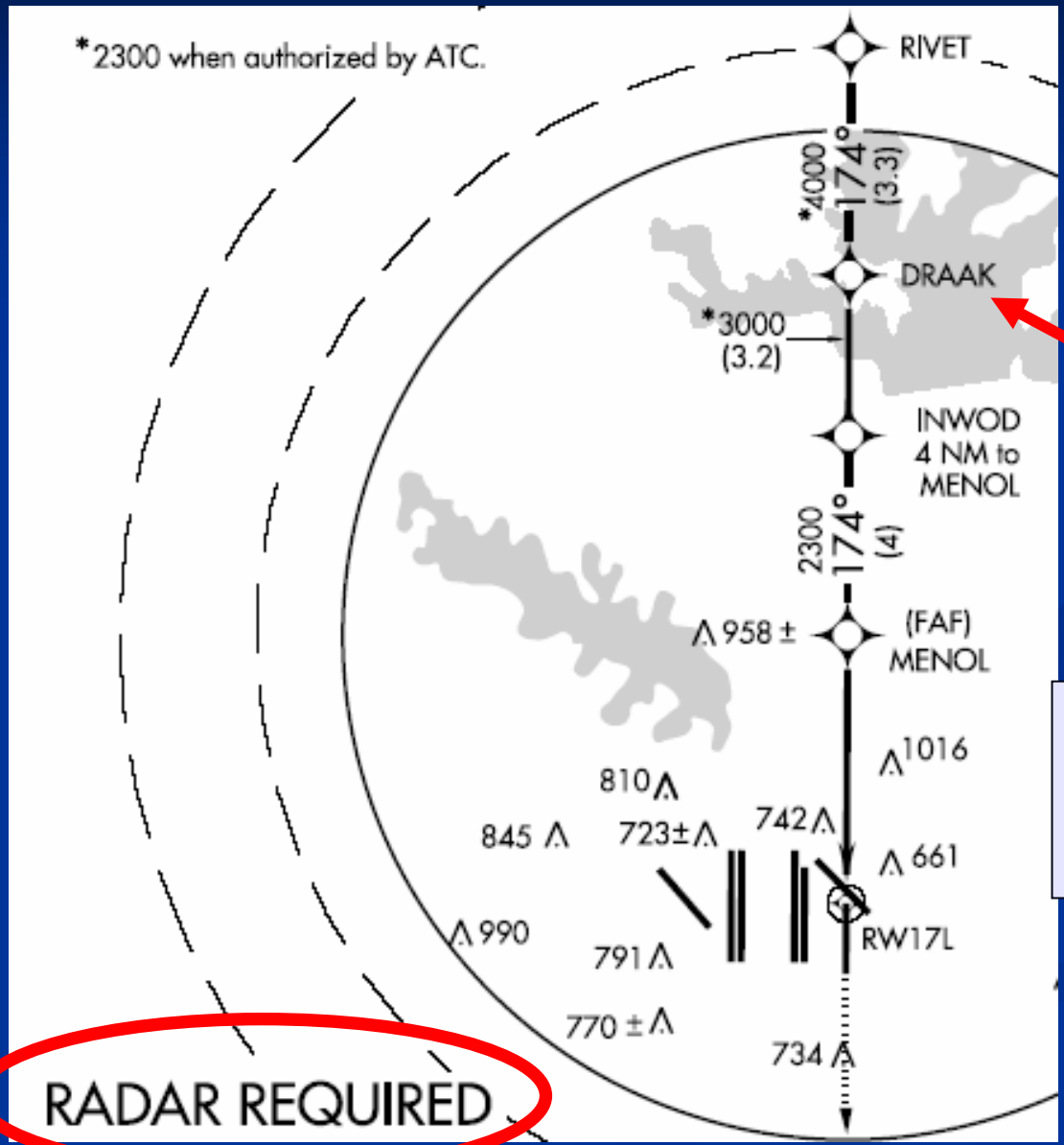


RODDE is an IF

Currently, Direct-to IF Clearances are not permitted



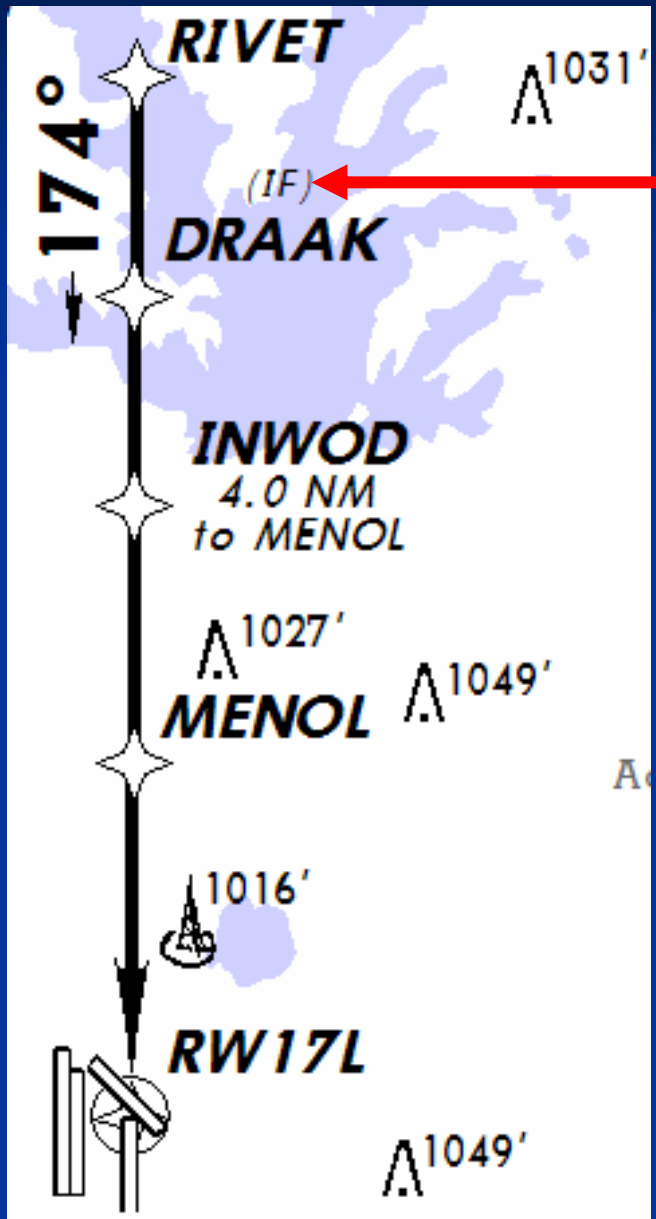
SIAPs Without IAF's



DRAAK is an Intermediate Fix

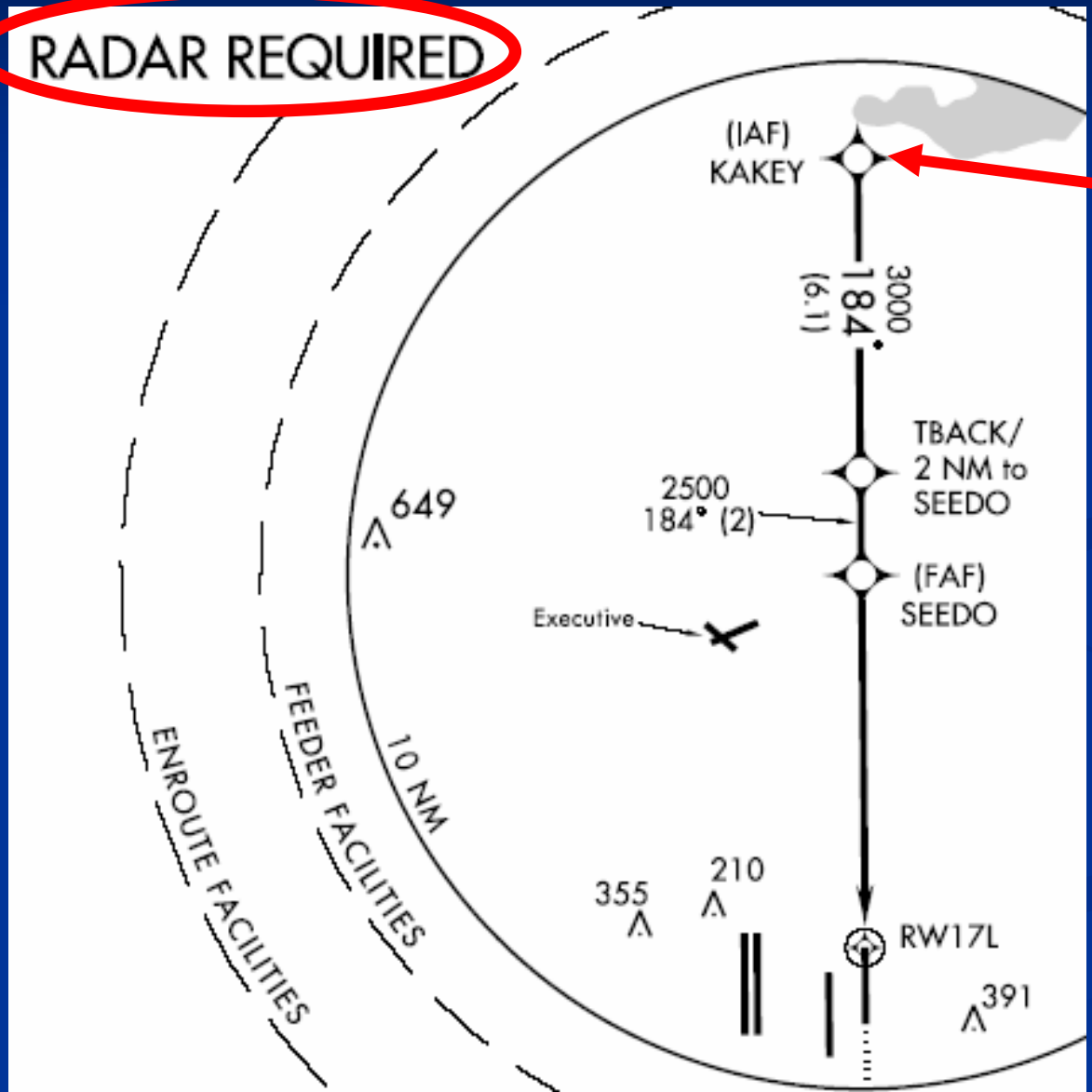
IF's Not Designated on NACO charts

SIAPs Without IAF's



Jeppesen Depicts DRAAK as "IF"

SIAPs Without IAF's



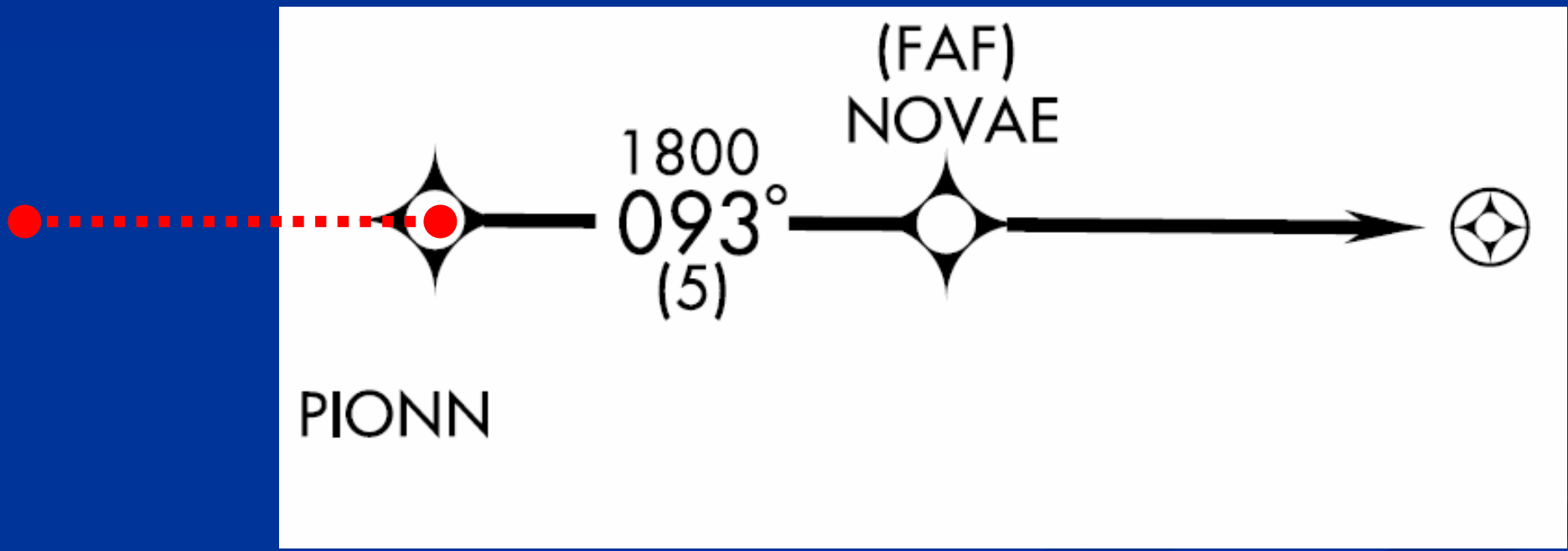
KMCO Rwy 17L

KAKEY is not an enroute fix

Intermediate Segment Begins at KAKEY

Isn't KAKEY an Intermediate Fix?

Published Procedure Track Does Not Exist West of PIONN



Vectors to RNAV (GPS) Approaches

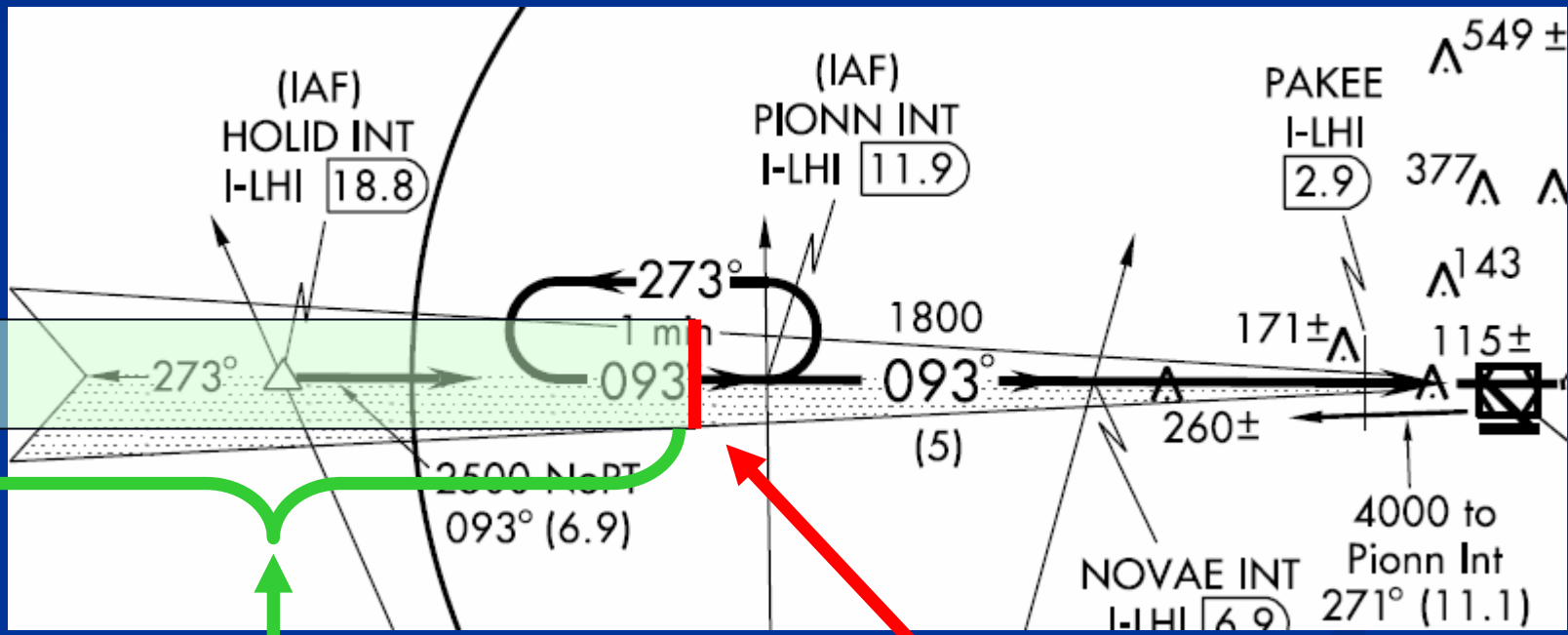
APPROACH GATE – "…established along the final approach course **1 mile** from the final approach fix..."

5-9-1. VECTORS TO FINAL APPROACH COURSE… vector arriving aircraft to intercept the final approach course:

a. At least 2 miles outside the approach gate unless one of the following exists:

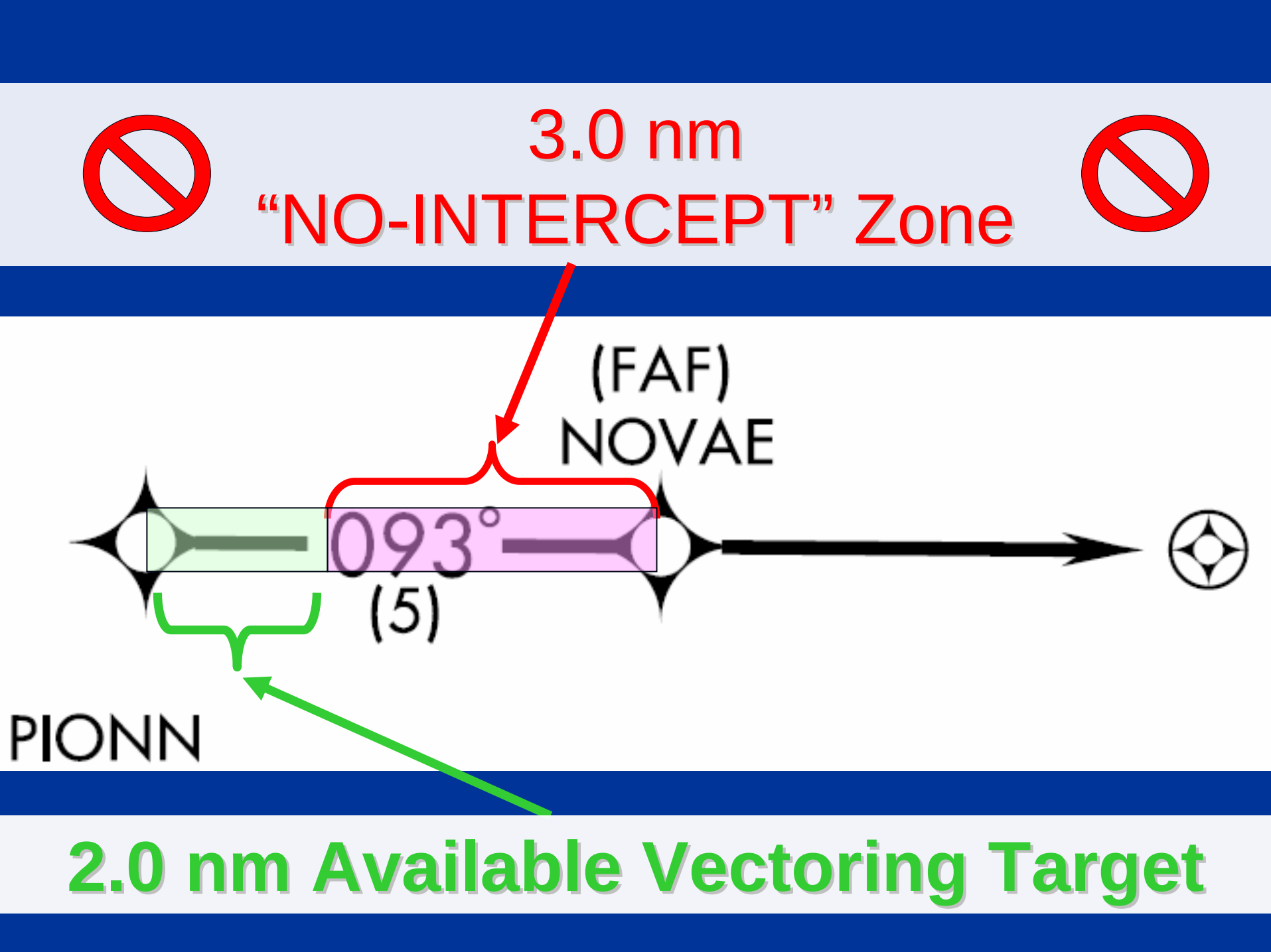
Exceptions… **do not apply** to RNAV aircraft being vectored for a GPS or RNAV approach.

ILS Localizer provides extended vectoring target

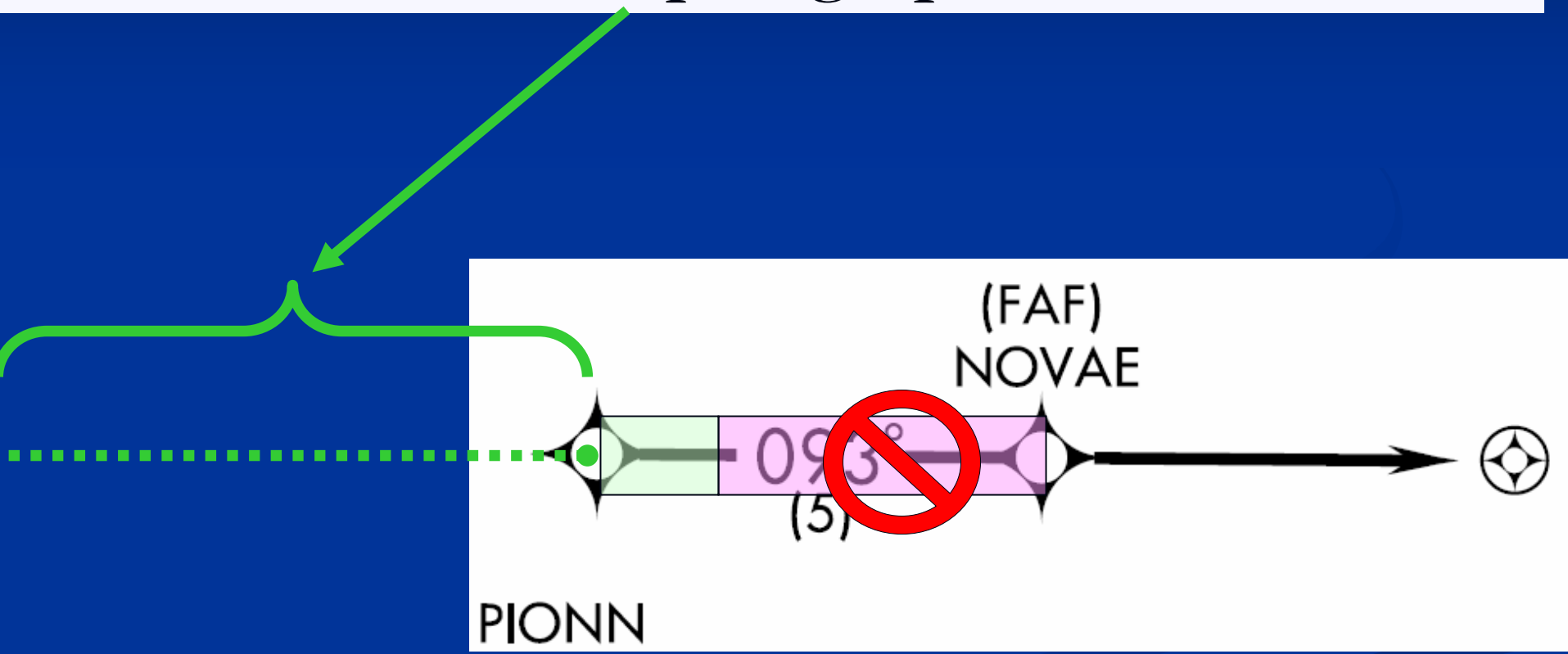


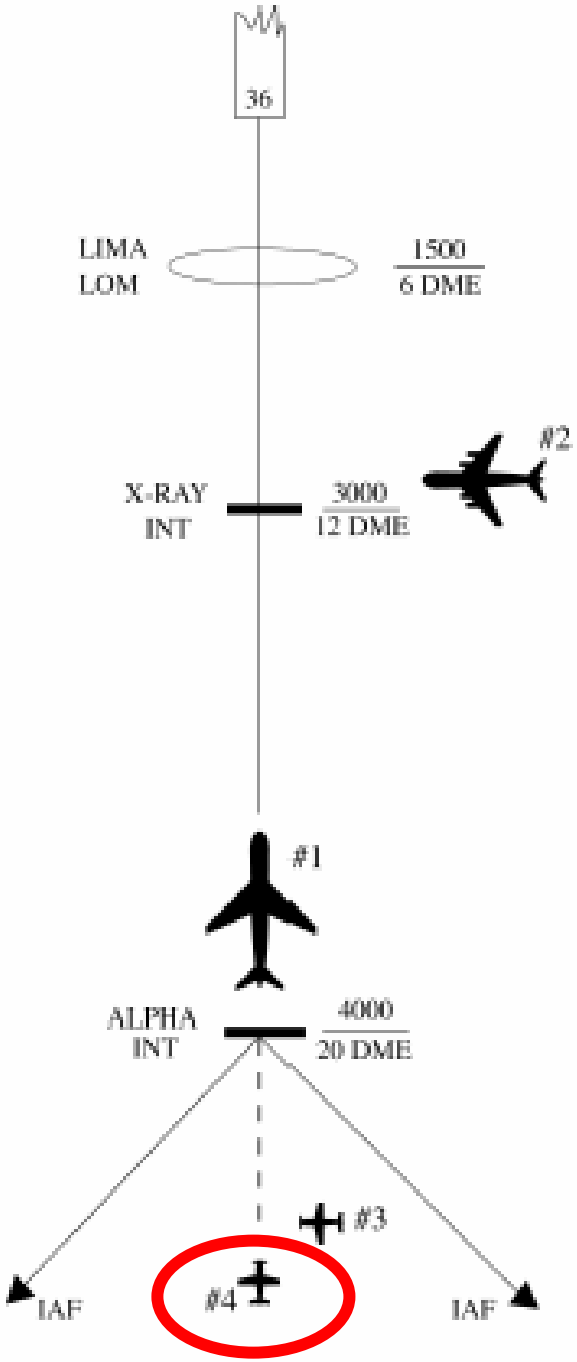
Intercept Area

Approach Gate


3.0 nm
"NO-INTERCEPT" Zone
(FAF)
NOVAE
093°
(5)
PIONN
2.0 nm Available Vectoring Target

“Intercepts” beyond the IF must comply with 7110.65 paragraph 5-9-4-c-2

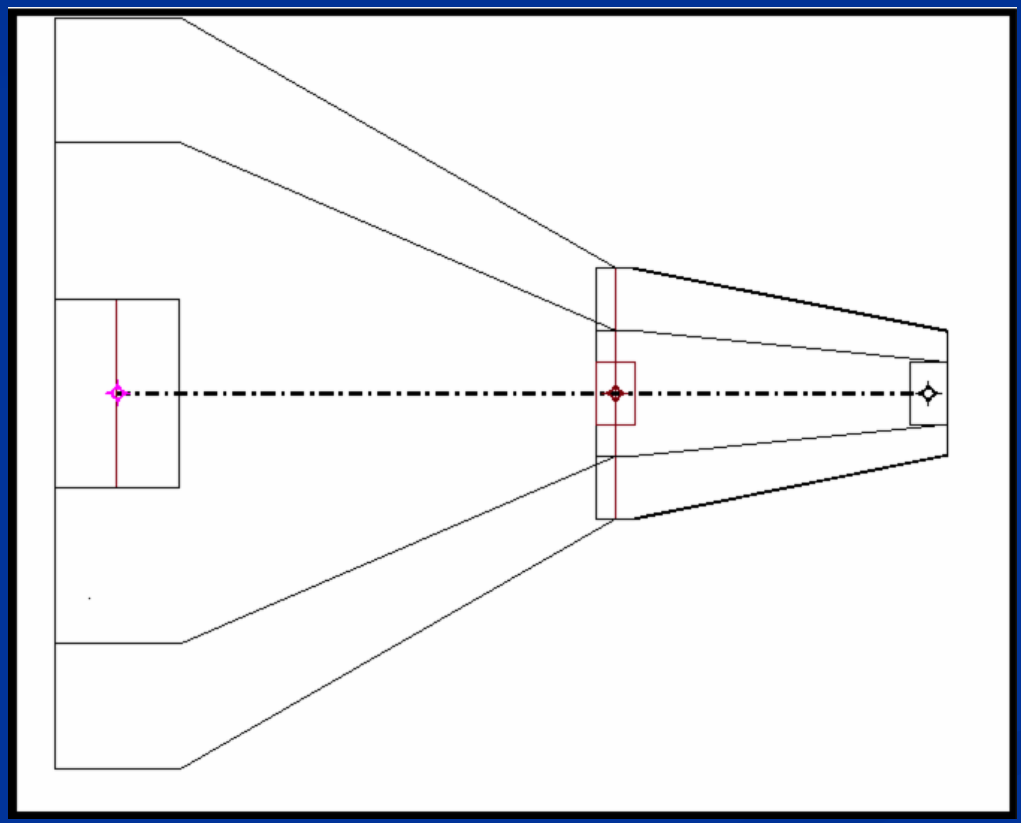




4. Aircraft 4 is established on the final approach course beyond the approach segments, 8 miles from Alpha at 6,000 feet. The MVA for this area is 4,000 feet.

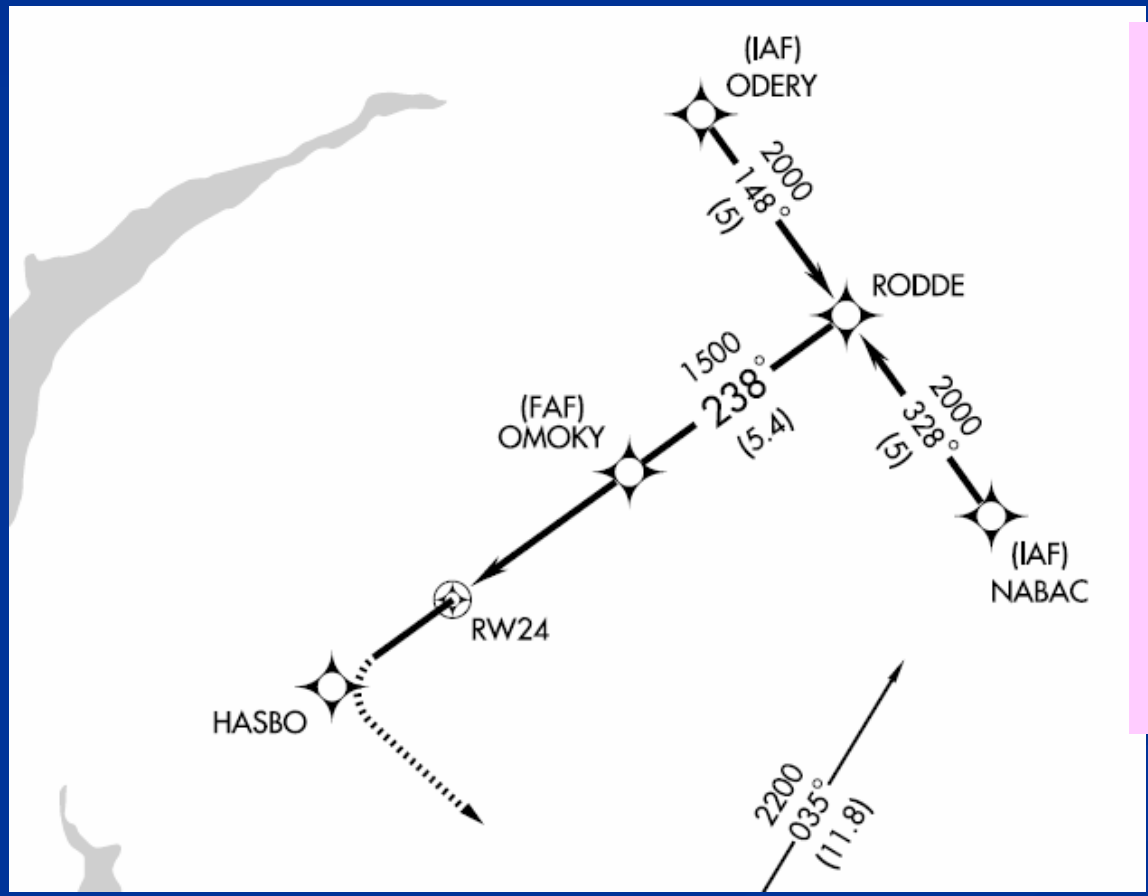
"Eight miles from Alpha. Cross Alpha at or above four thousand. Cleared I-L-S runway three six approach."

TERPS criteria already accommodate 90° turns at Intermediate Fixes

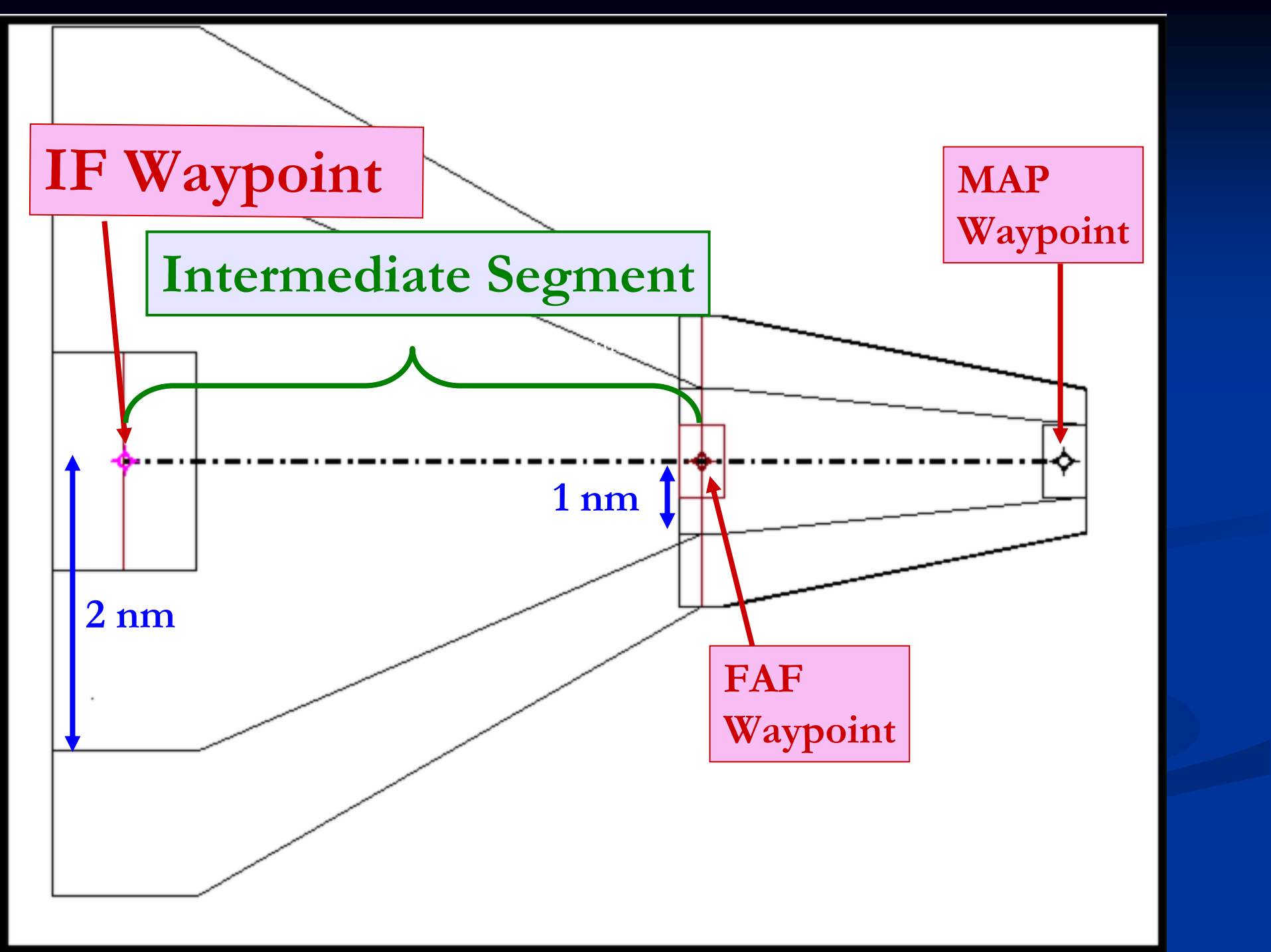


7110.65 and AIM Should Explicitly Permit Direct-to IF Operations with 90° Turn-angle Limit

TERPS criteria already accommodate 90° turns at Intermediate Fixes



7110.65 and AIM Should Explicitly Permit Direct-to IF Operations with 90° Turn-angle Limit


IF Waypoint
Intermediate Segment
MAP Waypoint
1 nm
2 nm
FAF Waypoint

Explicitly Permit RNAV Direct-to IF Operations

- Establish 90° Turn-angle limit at IF.
- Assign MVA/MIA as “cross” altitude per 7110.65 paragraph 5-9-4-c-2.
- Revise AIM
- Revise 7110.65

Explicitly Permit RNAV Direct-to IF Operations

- Prohibit Direct-to operations to Step-down fixes inside the IF.
- Apply "direct-to IF" policy to non-RNAV SIAPs when IF is depicted on chart.
- Additional Considerations
  - Minimum Distance to IF
  - Altitude Compatibility – Descent Gradient
  - Speed Limit at IF Waypoint

Rounding of DAs for Instrument Approaches

S.V. Massimini DSc

Frederick A. Niles

April 2004

Background

- **Prevailing visibility (PV) minima for US instrument approaches are specified in ¼ statue mile increments**
- **Traditionally, the Decision Height/Altitude (DA) of a precision approach (ILS/MLS/GLS) was computed as:**
  - **Touchdown Zone Elevation (TDZE) + Height Above Touchdown Zone (HAT) with all values rounded up to the nearest foot**
    - **DA = TDZE + HAT**
- **LNAV/VNAV and RNP approaches use the same technique, but round the DA to the next 20 ft increment**
  - **Example**
    - **HAT (from obstacles) = 250 ft, TDZE = 91 ft ➔ DA = 360 ft MSL**
    - **This implies that the actual published HAT will now be:**
      - **360 ft MSL – 91 ft = 269 ft**

Background (Continued)

- **Harmonization efforts with ICAO resulted in an agreement to also round up all MLS/ILS/GLS/LPV DAs to the next 10 ft value**
  - **Example:**
    - **HAT (from obstacles) = 250 ft, TDZE = 101 ft ➔ DA = 360 ft MSL**
    - **This implies that the actual published HAT will now be:**
      - **360 ft MSL – 101 ft = 259 ft**
  - **Implemented for LPV (FAA Order 8260.50)**
  - **Not yet implemented for ILS/MLS/GLS**
    - **Future change to FAA Order 8260.3B?**
- **Unclear as to why LNAV/VNAV and RNP are rounded to 20 ft, but LPV (and MLS/ILS/GLS) are rounded to 10 ft**

Background (Continued)

- **The 'break point' between 3/4 mile and 1 mile visibility occurs when the DA point is more than 3960 ft from the threshold**
  - **For 3 degree glide slope (GS) and a 50 ft threshold crossing height (TCH), the maximum HAT can be 257 ft (rounded to 1 ft)**
  - **At 258 ft HAT, the required visibility is 1 statute mile**

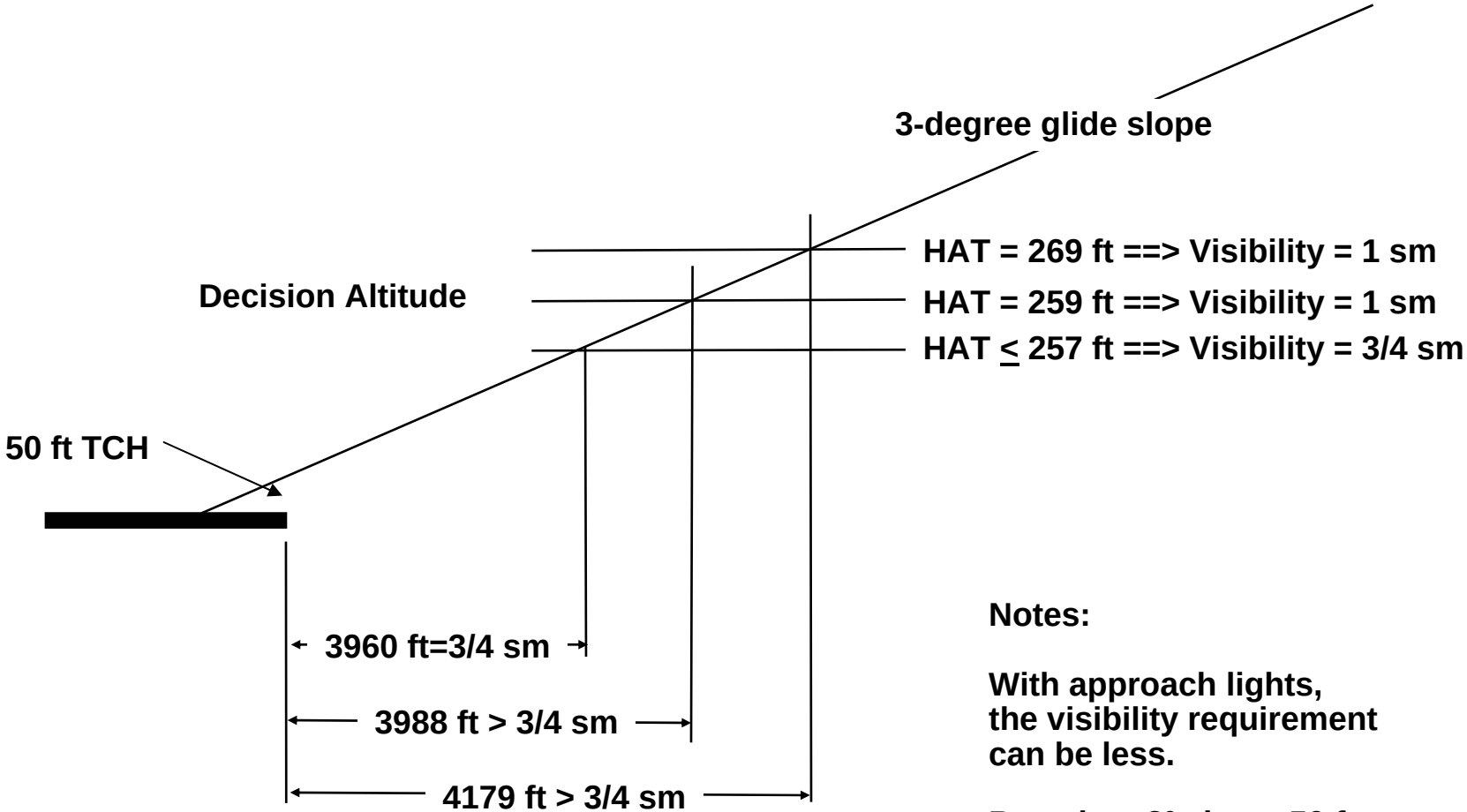
Notes:

- Other values apply for different GS and TCH values. However, the same arguments are germane.
- The arguments in this paper are primarily aimed at runways without approach lights.
  - Approach lights negate much of the negative effects of rounding, since lights reduce the visibility requirement by ½ mile.
  - Use of RVR rather than PV also affects the arguments in this paper, but RVR is normally only installed on runways with approach lighting.

Background (Concluded)

- **Note from the examples on slides 2 & 3 that:**
  - **An RNP or LNAV/VNAV with an un-rounded HAT of 250 ft (implying 3/4 mile visibility) can be rounded to 258-269 ft depending on the TDZE (implying 1 mile visibility)**
  - **An ILS, MLS, GLS, or LPV with an un-rounded HAT of 250 ft (implying 3/4 mile visibility) can be rounded to 258-259 ft depending on the TDZE (implying 1 mile visibility)**

HAT, DA, and Visibility
RNP, LNAV/VNAV, LPV, GLS, ILS, & MLS



Notes:

With approach lights, the visibility requirement can be less.

Based on 3º slope, 50 ft threshold crossing height

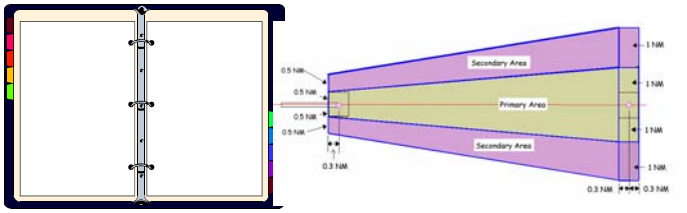
Effects of Rounding to Ten/Twenty Feet

- **Rounding has little effect on ILS, MLS, or GLS**
  - **Most (~80%) ILSs have 200 ft HAT (3/4 mile visibility)**
    - **Worst rounding would give 209 ft HAT (still less than 258 ft)**
    - **Most ILS/MLS runways have approach lights**
- **Rounding has little effect on LNAV/VNAV or RNP .3**
  - **Few, if any, of these approaches will reach HATs that allow ¾ mile visibility (i.e., ≤ 257 ft) regardless of rounding**
- **Rounding significantly affects LPV and RNP SAAAR***
  - **Due to the large percentage of LPV HATs that are 250-257 ft**
    - **Rounding causes LPVs in the 3/4 mile range to 'jump' to 1 mile**
  - **Applies to SAAAR approaches with low RNP values for same reasons**

•**Special Aircraft and Aircrew Authorization Required (SAAAR) for RNP < .3**

GPS Approach Minima Estimator (GAME) Model

Terrain Data Base



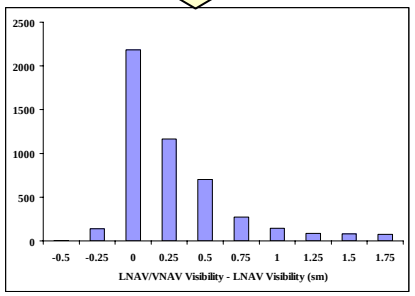
Approach Design Criteria

Obstacle Data Base

Minima Estimation Software

Repeat for Thousands of Runway Ends

Airports Data Base

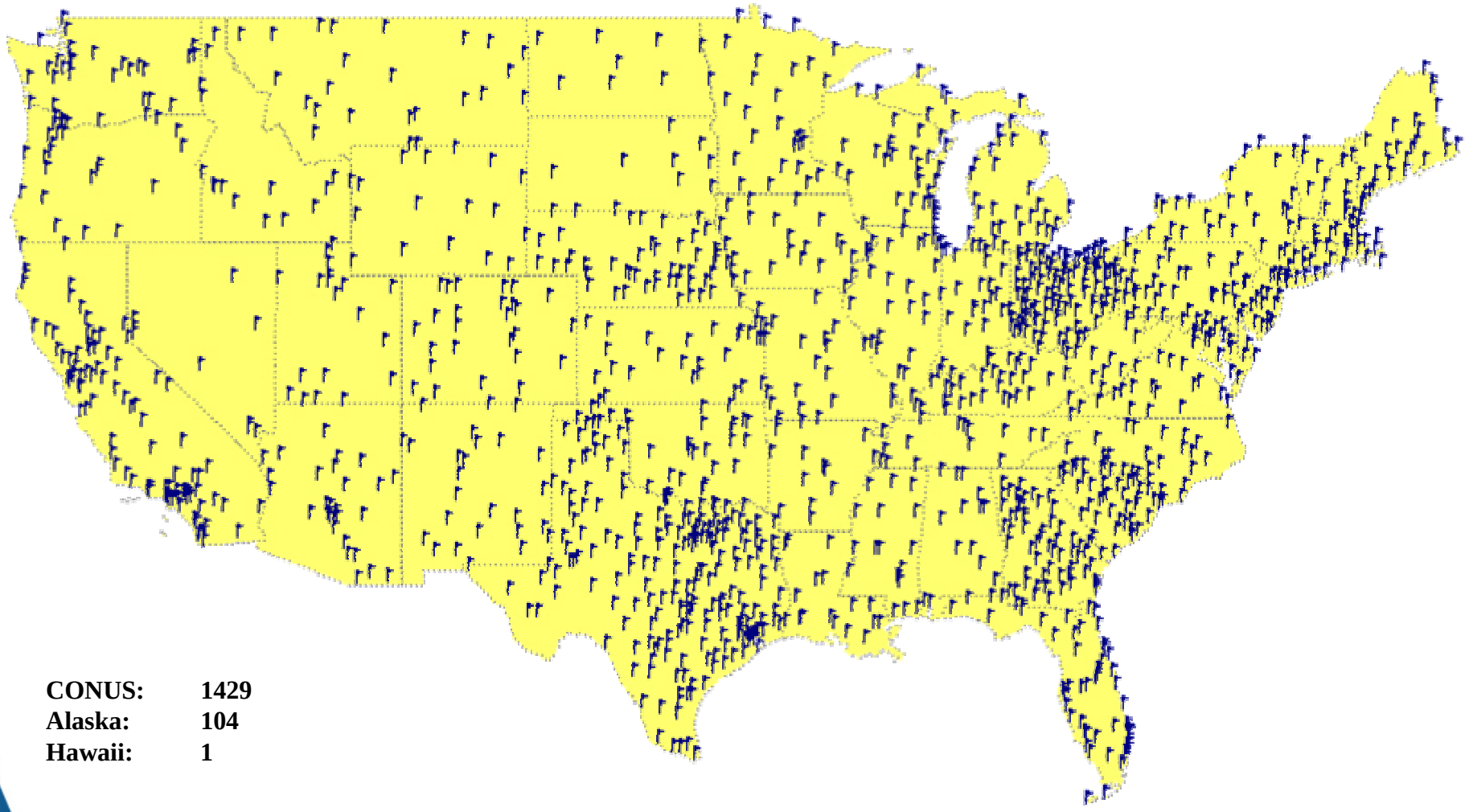


Generate Statistics

MITRE

CAASD

GAME Airports:
1534 airports and 5073 runway ends

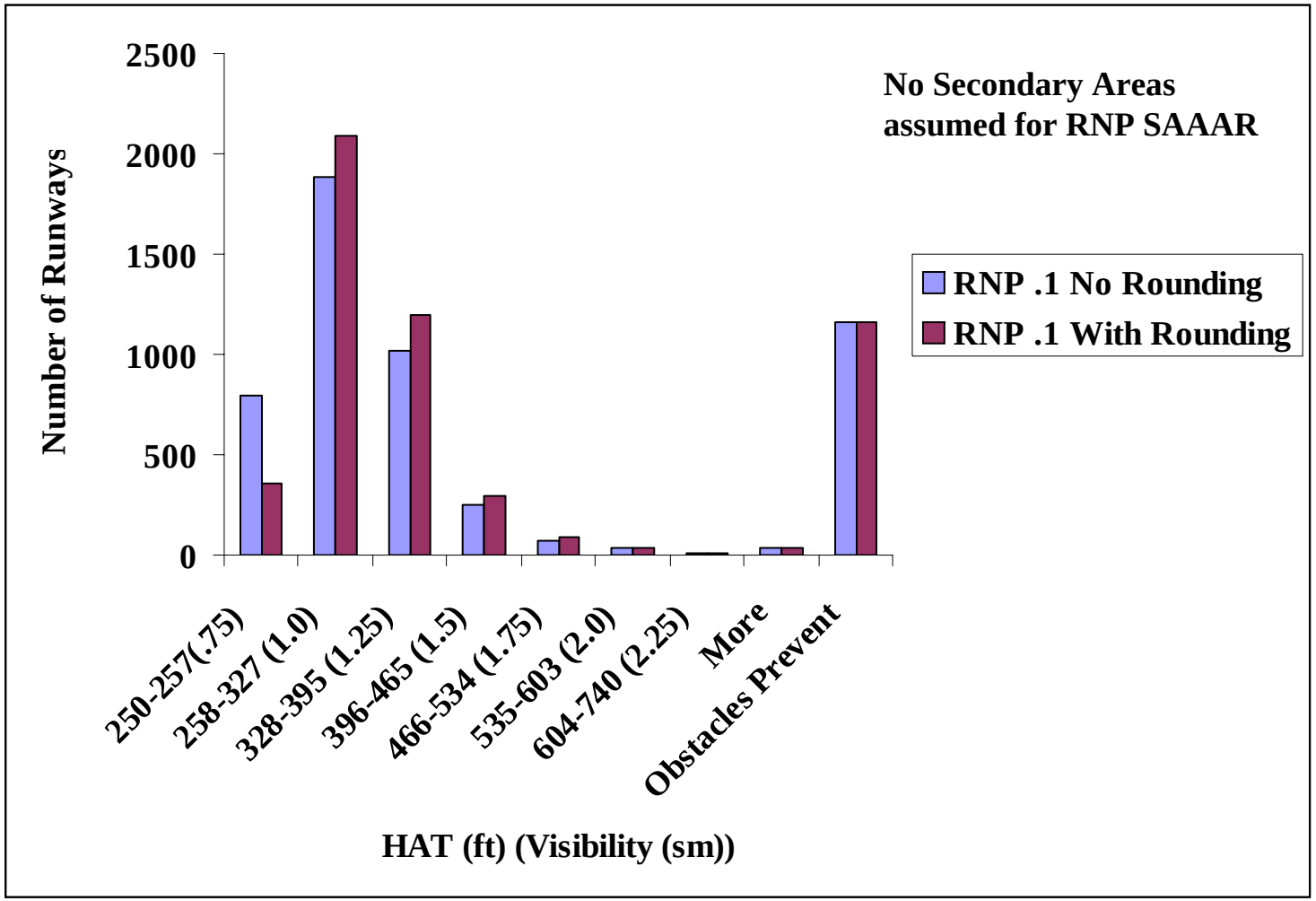


CONUS: **1429**
Alaska: **104**
Hawaii: **1**

MITRE

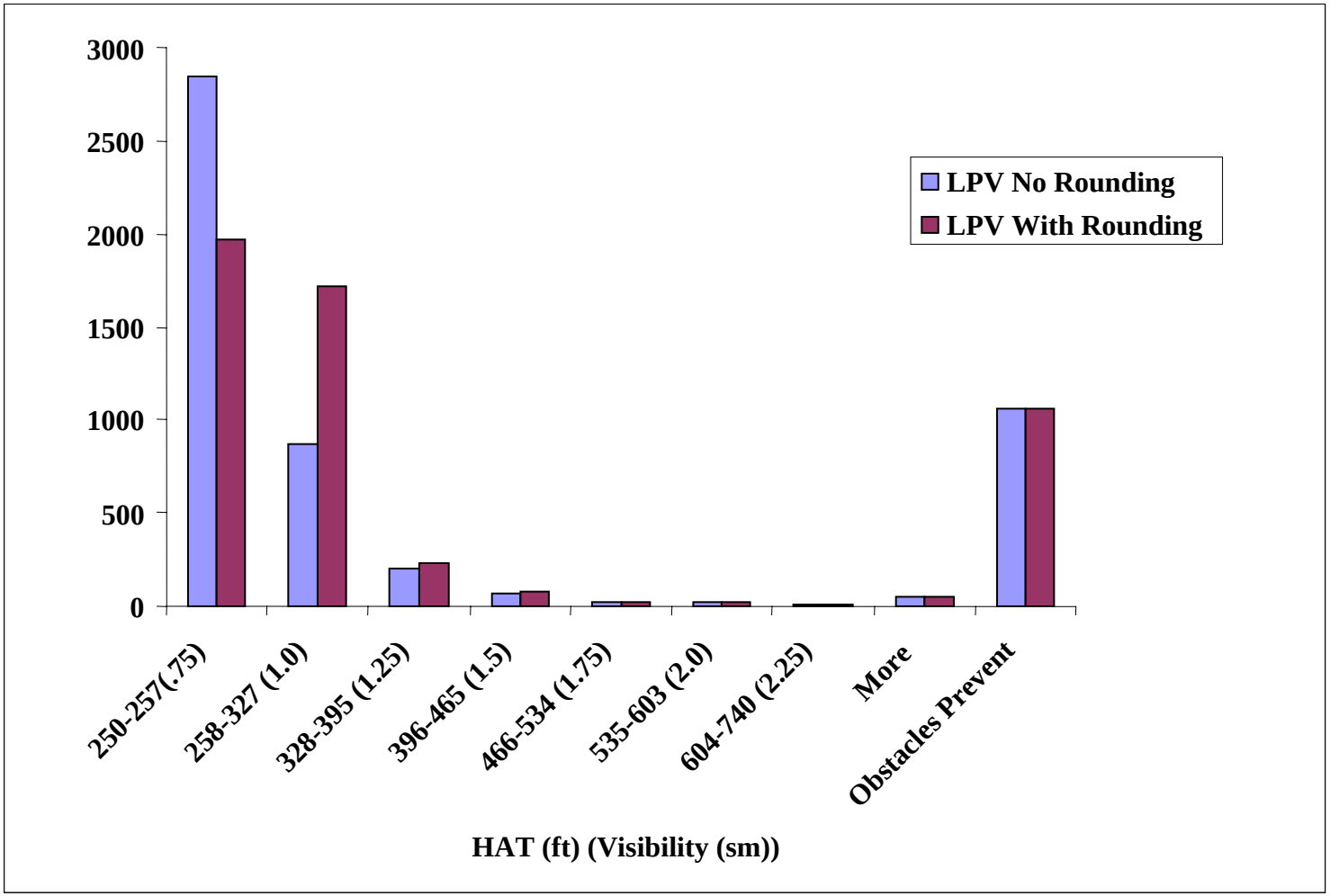
CAASD

Rounding of SAAAR RNP .1 DAs (GAME Estimates)



5142 runway ends at 1534 airports

Rounding of LPV DAs (GAME Estimates)



5142 runway ends at 1534 airports

Observations/Recommendations

- **Loss of 3/4 mile minima for harmonization seems unnecessary given the very small increases in visibility requirements (e.g., 28 ft from slide # 6) when considering:**
  - **14 CFR 91.175 requires 'flight visibility' to land from an instrument approach, but all of TERPS requirements are 'ground visibility'**
  - **PV is rather imprecise--only measures highest visibility over at least 180 degrees of horizon and not at the runway end**
- **There appears to be no practical difference in any of the vertically-guided approaches that would require rounding to differing scales (i.e., 20 ft versus 10 ft)**
  - **The pilot will determine DA on the same altimeter regardless of the type of approach flown**

Observations/Recommendations

- **Recommend**
  - **Do not round DAs (especially for LPV or RNP SAAAR approaches), or**
  - **Provide waivers for approaches if un-rounded HAT results in an HAT of $\leq$ 257 ft**
    - **Or equivalent HAT for other than 3 degree GS/50 ft TCH**
  - **Round all vertically guided approaches consistently**