U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
Air Traffic Organization Policy

ORDER
JO 7210.37C

Effective Date:
October 1, 2008

SUBJ: En Route Minimum Flight Rule (IFR) Altitude (MIA) Sector Charts

1. Purpose of This Order. This order establishes procedures and criteria to develop MIA sector charts for En Route air traffic facilities.

2. Audience. This order applies to the following Air Traffic Organization (ATO) service units: En Route and Oceanic, Terminal, and System Operations Services; all associated air traffic control Facilities; the FAA William J. Hughes Technical Center; Mike Monroney Aeronautical Center; and the National Flight Procedures Office (NFPO).

3. Where Can I Find This Order? This order is available on the MyFAA employee Web site at https://employees.faa.gov/tools_resources/orders_notices/.

4. Cancellation. This order cancels FAA Order 7210.37B, dated May 6, 1985.

5. Scope. This order establishes procedures and criteria to develop MIA sector charts for En Route air traffic facilities operating within the scope of the HOST automation platform. En Route facilities transitioning to the En Route Automation Modernization (ERAM) platform will establish and/or revise MIA sectors in accordance with the individual facility's ERAM transition plan.

6. Procedures. Each air route traffic control center (ARTCC) shall develop and implement MIA sector charts using these procedures/criteria. Use FAA Form 7210-9 (hard copy or equivalent electronic version) for facility status accounting and National Flight Procedures Office (NFPO) chart data review and approval. Establish MIAs with respect to all surface areas in delegated airspace as well as adjacent areas where control responsibility is assumed because of early handoff or track initiation. Divide the MIA sector charts into areas (referred to as MIA areas) as required in order to accommodate different MIAs without respect to air traffic control (ATC) sector or facility boundaries, as described below.

a. MIA Sector Charting Criteria.

(1) Establish the lateral boundaries of MIA areas by:

(a) Whenever possible, use an automated MIA tool approved/certified by FAA Flight Standards Service, En Route and Oceanic Safety and Operations Support, and the NFPO to aid in determining MIA boundaries.

(b) Using sectional aeronautical charts. Terrain or obstacle elevation figures and contour lines located on sectional charts or other United States Geological Survey (USGS) topographical maps may be used as guides to establishing MIA boundaries; however, it must be considered that terrain and man-made obstructions may not be depicted in their exact locations due to cartographic license.

Sectional charts are currently the only medium that identifies the floor of controlled airspace.

(c) Using geographical points defined by latitude and longitude to the nearest second.

(d) Addressing operational requirements where possible (e.g., normal traffic flows, minimum en route altitudes (MEAs) where lower than the MIA, areas where vectoring to approaches is required, etc.).

(e) Establishing MIA area boundaries a minimum of 5 NM from all terrain/obstructions that would impact the MIA. The obstacle evaluation area for a given sector includes a 5 NM buffer outside the MIA area boundary. When developing a sector to contain an airway in accordance with paragraph 6a(2)(f), the buffer of the airway sector only is equal to the lateral limits of the air traffic services (ATS) Route.

(f) Applying appropriate 5 NM buffer at ARTCC and MIA area boundaries.

(2) Establish an MIA for each area by:

(a) Whenever possible, using an automated MIA tool approved/certified by FAA Flight Standards Service, En Route and Oceanic Safety and Operations Support, and the NFPO to aid in calculating MIA values.

(b) Applying the appropriate mountainous or non-mountainous obstruction clearance criteria per FAA Orders 8260.19 and 8260.3. Round sector altitudes up to the nearest l00-ft increment to ensure the required obstacle clearance (ROC) is established within the sector and associated buffer area. Existing terrain/obstructions where less than minimum ROC has been applied due to the practice of rounding altitudes to the nearest 100-ft increment, to achieve a cardinal or 500-ft MIA sector altitude, may be retained. New obstructions must adhere to obstacle clearance standard requirements.

(c) Including the higher of a 200' adverse assumption obstacle (AAO) additive to terrain values to account for uncharted man-made obstructions not reported under 14 CFR Part 77.13 or an allowance for natural vegetation (mean maximum average tree height) when evaluating terrain values.

(d) Taking ROC reductions as prescribed in FAA Order 8260.3 and authorized in FAA Order 8260.19 only to achieve compatibility with Terminal routes or to permit vectoring to an initial approach fix. The additives in subparagraph 6a2.(c) above must be considered when reducing ROC. The allowance for natural vegetation must be considered when applying Order 8260.3, paragraph 1720b(1). The 200' AAO must be considered when applying Order 8260.3, paragraph 1720b(2). Explanation for any reductions must be entered on Form 72 10-9.

(e) Ensuring the depicted MIA is at least 300 feet above the floor of controlled airspace. Do **NOT** include buffer areas for controlled airspace evaluations.

NOTE 1: In some cases, controlled airspace application will result in an exceptionally high MIA: (e.g., in areas where the floor of controlled airspace is 14,500 MSL). When operationally required to provide ATC service in underlying Class G (uncontrolled) airspace, two MIAs may be established. The primary MIA must be based on obstruction clearance and the 300' floor of controlled airspace buffer. A second, lower MIA, that provides obstruction clearance only, may be established only for those instances when ATC is allowed to vector or provide service in uncontrolled airspace. The additional obstruction clearance MIA must be uniquely identified on the chart; e.g., by an asterisk (*).

NOTE 2: The existence of an MIA in uncontrolled airspace relates to terrain/obstruction clearance only; it does not constitute authority to conduct IFR operations within uncontrolled airspace.

Reference – FAA O 7110.65, para 5-6, Vectoring

(f) Adapting an airway or an appropriate block of airspace containing an airway as a separate MIA area to preclude En Route-Minimum Safe Altitude Warning (E-MSAW) nuisance alerts when that airway is below an adjacent MIA area altitude. MEAs shall be obtained from En Route low altitude charts and thus become the adapted E-MSAW alerting altitude for an MIA area that defines an airway. The ATS route boundary may be applied in lieu of a 5 NM buffer, except when the ATS route forms the boundary of an adjacent/surrounding MIA sector boundary, (reference paragraph 6.a.(l).(e))

(3) Where small contiguous MIA areas with different altitudes do not serve an operational need, combine them using the highest applicable MIA.

(4) To avoid a large MIA area with an excessively high altitude due to an isolated prominent obstruction, enclose the obstruction within its own MIA area. When the isolated obstruction is terrain, evaluate related slopes or ridge lines to ensure appropriate obstruction clearance criteria are applied.

(5) Each MIA area shall have the terrain/obstruction feature that constitutes the basis for the MIA, in addition to its elevation, highlighted in such a manner that would allow it to be easily found by a controller, but not clutter the MIA chart. Large MIA areas with irregular or precipitous or multiple obstructions may have more than one elevation highlighted.

(6) MIA areas should be labeled with respect to the E-MSAW area identification criteria. The identifier has three letters and two digits (LLLdd), to identify areas relative to significant geographical points or fixes.

(7) Upon completion of Sector Design and Analysis Tool (SDAT) training for designing MIAs, SDAT must be used in preference to manual methods to reduce the risk of human calculation or drawing errors and to facilitate review and processing time.

b. MIA Sector Chart Display. Applicable portions of the facility's MIA chart shall be displayed at each low altitude sector. This MIA sector chart shall accommodate operational requirements for the sector involved. Air traffic managers shall determine the appropriate method for displaying this information at the sector. MIAs shall be displayed with each associated MIA area. For an airway adapted as a MIA area, (reference paragraph 6.a.2.(e)):

(1) If the MEA is sufficient for vectoring, the MIA and the MEA shall be depicted as one altitude for that area.

(2) If a higher altitude is required for vectoring, then both the adapted E-MSAW alerting altitude (MEA) and the vectoring altitude shall be displayed on the MIA sector chart, associated with the proper area, and separated by a slash (i.e., 90170). Each sector chart or facility directive shall contain an explanation of these split altitudes to the effect that:

(a) The higher altitude on the left of the slash is the appropriate altitude for off-airway operations (radar vectoring).

(b) The lower altitude to the right of the slash is the adopted E-MSAW alerting altitude.

c. MIA Sector Chart Processing. Process MIA charts and ROC reduction requests per Order 8260.19 criteria as follows:

(1) Draw MIA sector charts directly on current sectional charts.

(2) Using FAA Form 7210-9, prepare MIA sector chart and chart data record in duplicate. Indicate amount of obstacle clearance reduction in the altitude adjustment (ALT ADJ) column. This column is also used to document the difference in required altitude and round-off altitude. Use the REMARKS column for explanation of any ROC reduction taken.

(3) Forward charts and chart data records to the NFPO for annual review and certification. One copy of each chart and chart data record with NFPO approval will be returned to the facility.

(4) In lieu of manually drawing and submitting MIA charts as described in 6.c.1-3, facilities using a certified MIA automation tool (i.e., SDAT) may submit the MIA chart and associated chart data records via automated means approved by NFPO. This will expedite and simplify the process for both facilities and NFPO.

(5) Submit MIA charts annually and submit change packages as they occur.

(6) Monitor available sources including the weekly National Flight Data Digest (NFDD) pertaining to construction notices that may affect specific MIA areas. When needed, revise the affected charts.

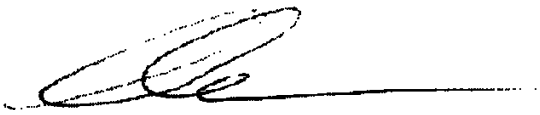
(7) Verify that the altitude information adapted in the National Airspace System (NAS) E¬MSAW polygons agree with the MIA sector charts.

7. Distribution. This Order affects select FAA Washington Headquarters offices, En Route and Oceanic Service Area offices, FAA William 1. Hughes Technical Center, Mike Monroney Aeronautical Center, ARTCCs, and the NFPO.

8. Background. MIA sector charts provide minimum IFR altitude information for off-airway operations (e.g., radar vectors, point-lo-point direct flights, or crossing restrictions for aircraft not yet on an established portion of an approach). MIA charts and associated clearance altitudes are established without respect to normal radar coverage within the area concerned. Prior to the development of an automated tool, the methodology for developing MIA charts had been a purely manual process involving searches for terrain elevation points and obstruction files for new obstruction information, (buildings, towers, etc.); which would result common errors requiring re-submissions.

SDAT is the automated software system approved/certified by FAA Flight Standards Service (AFS), En Route and Oceanic Safety and Operations Support, and the NFPO for designing, preparing and validating MIAs. Automation tools provide digitized terrain modeling with horizontal/vertical accuracy greater than or equal to the minimum required for MIA charts, and consider a comprehensive vertical obstacle file that includes many man-made obstructions not depicted on paper charts. This document includes procedures for automated development and processing of MIA charts with SDAT.

9. Safety Risk Management. SDAT automates but does not change current practices. With the exception of the AAO, this order does not affect existing MIA criteria or established rules. A Safety Risk Management analysis was conducted for the AAO assessment required for developing MIA charts. The risks have been determined to be acceptable and the results of the assessment are included in the associated Safety Risk Management Document (SRMD).



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