

AERONAUTICAL CHARTING FORUM
Charting Group
Meeting 09-02 - October 28-29, 2009

RECOMMENDATION DOCUMENT

FAA Control # 09-02-219

Subject: VFR Chart Enhancements

Background/Discussion: In 1998, the FAA and industry joined together to form the Commercial Aviation Safety Team (CAST) to address commercial aviation safety. CAST has developed, and continues to refine and implement, an integrated, data-driven strategy to reduce the commercial aviation fatality risk. Aviation safety experts working in Joint Safety Analysis Teams (JSATs) develop Safety Enhancements that form the core of CAST's safety strategy. These Safety Enhancements address the problems and contributing factors associated with the leading causes of aviation accidents. JSATs consist of individuals representing a cross-section of the international commercial aviation community and a broad spectrum of aviation expertise, including human factors specialists, line pilots, aeronautical engineers, regulators, data experts, safety analysts, air traffic controllers, researchers and maintenance experts. Co-chairs from the FAA and industry direct the teams.

In 2003, CAST chartered the Remaining Risk (RR) JSAT to address four safety areas, including midair collisions. Five accidents and one near-collision were analyzed as part of the midair review. Several of the accidents investigated involved VFR aircraft unknowingly straying into protected airspace due to the inability to ascertain where they were. The analysis linked these accidents to issues with the airspace design and with the complexity of the VFR charts used by the pilots.

The analytical arm of CAST, the Joint Implementation Measurement and Data Analysis Team (JIMDAT), evaluated the proposed safety enhancements from the RR JSAT aimed at addressing these problems. Included were the recommendations that regulators simplify and standardize the design of Class B airspace, VFR charts be enhanced to aid in the recognition of that airspace, enhance the recognizability and correlation of ground reference points related to airspace boundaries, and enhance VFR routes to ensure they are easily-identifiable.

These recommendations have been approved for acceptance into the CAST safety plan.

Recommendations:

- 1) Eliminate hypsometric tint following the outer boundaries of Class B airspace areas to enhance identifiability on VFR charts. An example of this enhancement is found on the Washington VFR chart series applied against the Washington DC Metropolitan Area Special Flight Rules Area symbol.
- 2) Eliminate hypsometric tint behind VFR checkpoint descriptive text. An example of this enhancement is found on VFR charts which eliminated hypsometric tint from text of highest obstruction on visual charts.
- 3) Eliminate hypsometric tint inside VFR Transition Route symbols. An example of this enhancement is found on VFR charts which eliminated hypsometric tint inside class airspace frequency boxes on visual charts.

Comments: This recommendation affects IACC No. 2.

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MEETING 09-02: Mr. George Sempeles, FAA/ATO-R, briefed the issue, referring to a 2003 CAST study performed to reduce the risk of fatal aviation accidents by 80% since 1998. They estimated a remaining risk of 27% to reach their goal.

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The analytical arm of CAST, the Joint Implementation Measurement and Data Analysis Team (JIMDAT), evaluated the proposed safety enhancements aimed at addressing these problems. Included were the recommendations that regulators simplify and standardize the design of Class B airspace, VFR charts be enhanced to aid in the recognition of that airspace, enhance the recognition and correlation of ground reference points related to airspace boundaries, and enhance VFR routes to ensure they are easily-identifiable.

The following recommendations were included in the CAST safety plan:

- 1) Eliminate hypsometric tint (i.e. apply a “white mask” to the color tint used for terrain contours/shaded) along the outer boundaries of Class B airspace areas in order to enhance its identification on VFR charts. An example of this enhancement is found on the Washington VFR chart series with the Washington DC Metropolitan Area Special Flight Rules Area symbol.
- 2) Eliminate hypsometric tint (place a “white mask”) behind VFR checkpoint descriptive text. An example of this enhancement is found on VFR charts where the hypsometric tint has been eliminated from under the height value of the highest obstruction on a visual chart.
- 3) Eliminate hypsometric tint (place a “white mask”) inside VFR Transition Route symbols, i.e., the “open directional route arrows” shown on the LAX TAC chart. An example of this enhancement is found on VFR charts where the hypsometric tint has been eliminated inside airspace frequency boxes on visual charts.

Mr. Hal Becker, AOPA, commented that his organization would support any enhancement that would improve chart readability to address airspace recognition and avoidance/compliance. However, he would like to see some actual prototypes of the FAA’s VFR chart products and possibly some human factors and pilot focus group evaluations made. There is a possibility that so many ‘enhancements’ will actually result in chart clutter and defeat the purpose.

Mr. Paul Gallant, FAA/AJR33, asked if there is an electronic display difference between raster and vector chart output. Mr. Ted Thompson, Jeppesen, answered, “yes, there is”. Electronic displays of pre-composed charts in raster form would result in the same appearance evident on the corresponding paper charts. However, some electronic display devices that dynamically display shaded relief/terrain contours and airspace

boundaries might not apply the same recommendations. Also, dynamic displays have unique factors to consider such as screen resolution, update/refresh rates, etc. A comment was made that regardless of depiction details, pilots are still expected to plan, review, and brief aspects of their route of flight, even if operating VFR in complex airspace environments.

ACTION: Mr. Eric Freed, FAA/AeroNav Services, Visual Charting and Airport Mapping Team agreed to create a series of prototypes to illustrate the various recommendations. To be presented at the next ACF.

MEETING 10-01: Mr. John Moore, FAA/AeroNav Svc, reviewed issue 09-02-219 and 09-02-227 together and recapped the minutes of the CAST recommendation. Mr. Ron Haag, FAA/AJW-3781, displayed the prototypes and reviewed the proposed changes. He noted that the LA TAC was used because it was thought to give the best representation of the available TAC's and they purposely did not use the Washington DC TAC because of the amount of masking already used due to the Special Use Airspace. The prototypes were reviewed and comments were then discussed.

Mr. Hal Becker, AOPA, liked the white mask behind the VFR checkpoint descriptive text and the white mask of the outer boundaries of the Class B airspace.

Mr. Jim Fee, CAST, agreed with Mr. Becker.

Mr. Richard Boll, NBAA, did not like white mask around the underlying symbols / text labels that are overprinted by the Class E airspace boundaries.

Mr. Chris Criswell, FAA/ATO-R, liked the charts the way they currently exist.

Mr. George Sempeles, FAA/ATO-R, liked the white mask of Class B and the white mask inside VFR transition Route Symbols but did not like the white mask around underlying symbols / text that are overprinted by the Class E airspace boundaries. Would prefer to move the symbols / text and use a leader line.

Ms. Francie Hope, FAA/WSC, agreed with Mr. Sempeles.

While there was some consensus on the proposed changes, it was decided to produce a Washington DC TAC prototype using only those proposed changes agreed to by the ACF. The ACF did not agree with placing a white mask around underlying symbols / text that are overprinted by the Class E airspace boundaries. In order to get a different perspective on the impact of the proposed changes the Washington DC TAC will only depict the following: white mask behind the VFR checkpoint descriptive text, the white mask of the outer boundaries of the Class B airspace, and moving the magenta type which overlies the magenta Class E airspace and using a leader line.

ACTION: Mr. Ron Haag will bring prototype of the Washington DC TAC to the ACF for further review.

MEETING 10-02: Note: This issue has been combined with 09-02-227

Mr. Ron Haag, FAA/AJW-321, briefed the latest changes that were applied as a result of the feedback from ACF 10-01. He noted that the Washington, DC TAC was used as a prototype at the request of the ACF. This is because the DC TAC is considered to be a cluttered chart. Issues that were readdressed: **(1)** The white mask of the outer boundaries of the class B airspace – Mr. Haag said this was easy to do on the TAC charts but could be very difficult on Sectional charts. **(2)** Magenta type which overlies the magenta Class E airspace and using a leader line – Usable on TAC, but not on Sectional charts. Moving magenta text off the magenta vignette is a painstaking and manual process, but is being progressively accomplished. **(3)** White mask behind the VFR checkpoint descriptive text – this was not addressed by Mr. Haag.

Francie Hope, FAA/AJV-W2, said that the Southern California Airspace Users Group (SCAUG) liked the white masking and mentioned that she and Mr. George Sempeles are on the VFR Safety Task Force which support the white masking of the Class B airspace, especially the LA airspace. Mr. Chris Criswell, FAA/AJR-32 and Ms. Valerie Watson, FAA/AJV-3B, both expressed concern that the white masking undermines the importance of the SFAR in the D.C. area. Ms. Watson added that if this policy was adopted it would have to be adopted for the entire chart series and not just the charts in the LA area. This would adversely impact the D.C. area and she suggested that it not be used.

Mr. John Moore, FAA/AJV-3B, addressed the fact the change would have a significant impact on chart production and asked Mr. Jim Fee, AVP-200, to weigh the effort involved against the expected outcome of reducing airspace violations. Mr. Fee said data does suggest that enough incidents occur between GA & 121 (1 in 100) to support the need for chart enhancements, especially the white mask of the Class B and VFR Checkpoints. Mr. Tom Kramer, AOPA, said the issue is not necessarily ignorance on the pilot's part in determining where the class B airspace is, but on airspace design criteria that allow GA pilots to get within the TCAS alert areas but remain outside of class B. Mr. Moore asked Mr. Fee if he could bring more information about the causal factors of the violations, in order to better understand the reasons for the violations and better determine if the proposed chart changes are the correct solution or not. Mr. Fee agreed that if this was not the right fix then he would like to continue to research and find the right fix.

ACTION: Mr. Fee, FAA/AVP-200, to brief in more detail the safety issues that brought this to the table and other continuing research he has obtained towards finding a solution.

MEETING 11-01: Note: This issue has been combined with 09-02-221

Mr. James Fee, FAA/AVP-200, gave a general overview of current charting practices of Class B Airspace and presented options proposed by CAST on how to potentially alter and disseminate graphic depictions of Class B Airspace. One option presented was to use a white mask behind the Class B boundary depiction, similar to that used in

depicting the SFRA boundary depiction used on the Washington Sectional and Baltimore/Washington TAC VFR charts.

The discussion moved to RD 09-02-221 with a presentation given by Mr. Ron Haag. See the comments for RD 09-02-221.

ACTION: Mr. Fee, FAA/AVP-200, to present Mr. Ron Haag's presentation (given for 09-02-221) at the next CAST meeting, scheduled for June 2011.

ACTION: Mr. Fee will report back at the next ACF if the proposals are acceptable to the CAST.

MEETING 11-02: Mr. John Moore, FAA/AJV-3B, summarized the issue and provided an update. Mr. Jim Fee, FAA/AVP-200, was unable to attend ACF. Mr. Moore conveyed that Mr. Fee had presented the proposals that came out of the ACF 11-01 (including the AeroNav Products' creation of detailed Class B depictions of all Class B areas, to be available for free download) to the CAST committee and that they were accepted.

Refer to 09-02-221 regarding the briefing given by Mr. Ron Haag, FAA/AJV-321, of the implementation of enhancements.

STATUS: CLOSED