



## ATOP-R&D

### Human Factors Newsletter # 05-19

October 1, 2005 – October 15, 2005

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**FAA/Industry Training Standards (FITS):** The FITS program is a partnership between FAA, industry, and academia designed to enhance general aviation safety. This is accomplished by developing flight training programs that are more convenient, more accessible, less expensive, and more relevant to today's users of the National Airspace System. A report on research to "review the goals and purpose of the FITS program, and the existing research supporting the program objectives, with the specific aim of identifying future research needs that may help make the FITS objectives a reality" is available. Please point to: [http://www.hf.faa.gov/docs/508/docs/ga\\_FITS\\_final.pdf](http://www.hf.faa.gov/docs/508/docs/ga_FITS_final.pdf).

*This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 2: Reduce the number of fatal accidents in general aviation.*

Point of Contact: W. Krebs, ATO-P R&D

**Flight Symbology:** Volpe Center researchers Michelle Yeh and Divya Chandra recently published a technical report titled "Designing and Evaluating Symbols for Electronic Displays of Navigation Information: Symbol Stereotypes and Symbol-Feature Rules (DOT/FAA/AR-05/48; DOT-VNTSC-FAA-05-16). This report presents the findings of two studies related to the design of symbology for electronic displays of navigation information. The report also includes some recommendations on how to evaluate symbology. The goals of this effort are to identify features

of navigation symbology that are problematic when presented on electronic displays, and develop a method to design and evaluate symbology that takes into account the different media and platforms on which they will be displayed. The results support the development of recommended best practices. This report is available at the Volpe website: [www.volpe.dot.gov/opsad/pubs.html](http://www.volpe.dot.gov/opsad/pubs.html).

**Abstract:** There is currently no common symbology standard for the electronic display of navigation information. The wide range of display technology and the different functions these displays support makes it difficult to design symbols that are easily recognizable across platforms. This report presents the findings of two studies related to the design of symbology for electronic displays of navigation information. Experiment one addressed whether symbols have key features that are necessary for recognition, i.e., symbol stereotypes. Experiment two tested symbol-feature rules, which define a consistent way to design symbols, to determine if pilots could learn and apply them. The resulting guidelines were provided to the Federal Aviation Administration, industry, and the International Civil Aviation Organization, and are documented in this report. Suggestions for evaluating symbology are also provided.

*This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objectives 1 and 2: Reduce the commercial fatal accident rate; Reduce the number of fatal accidents in general aviation.*

Points of Contact: (D. Chandra and M. Yeh, VNTSC)

**Electronic Flight Bags (EFB):** The Volpe Center hosted an FAA-Industry EFB meeting in Cambridge, Massachusetts on September 7-8, 2005 to discuss a draft EFB job aid for use by FAA inspectors. Volpe Center staff led a working group consisting of participants from FAA Flight Standards and Aircraft Certification to develop this preliminary draft material for the EFB Job Aid. The meeting provided an opportunity for an overview and review of the EFB Job Aid material and its intended use in combination with Advisory Circular (AC) 120-76A "Guidelines for the Certification, Airworthiness, and Operational Approval of EFB Computing Devices." Comments on the draft materials are due by October 30, 2005. Over 100 attendees came for the meeting from around the globe. Minutes for the meeting are available from Volpe upon request. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 1: Reduce the commercial fatal accident rate.* (D.Chandra, VNTSC)

**En Route Automation Modernization:** Engineering research psychologists from the William J. Hughes Technical Center's NAS Human Factors Group presented a progress briefing to the En Route Automation Modernization (ERAM) test and evaluation group. The briefing discussed ongoing research to develop methods and metrics for comparing the effectiveness of ERAM to the legacy en route automation system. The human factors work was conducted in support of the Automation Metrics Test Working Group (AMTWG) and focuses on important human factors issues such as controller performance and workload. So far, the work has focused on identifying the most frequent and critical controller interactions for use in future analyses and tests. Further analysis will examine the selected interactions on metrics such as the frequency of use, the method of use (e.g., trackball versus keyboard), time to complete, and error rate. User interface changes are one of several areas where ERAM has the potential to affect controllers in positive

and perhaps negative ways. In the coming months, the project will develop metrics to examine other aspects of ERAM, such as the use of a single flight plan database. The focus will be on controller performance and workload. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 7: Enhance the safety of FAA's air traffic systems.* (K. Allendoerfer, WJHTC)

**Aviation Maintenance:** Carla Hackworth is in Amsterdam, October 17 – October 21, 2005 to confer with Joint Aviation Authority and European Aviation Safety Authority representatives regarding the upcoming International Airline Maintenance Survey. The focus of the survey will be on human factors practices of Maintenance Repair Organizations, as new rules require maintenance operations to train key personnel in human factors. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objectives 1 and 2: Reduce the commercial fatal accident rate: Reduce the number of fatal accidents in general aviation.* (C. Manning, CAMI)

**Unmanned Aerial Vehicles:** On October 11-14, 2005, Kevin Williams traveled to FAA Headquarters and to Aurora Flight Sciences in Manassas, VA in support of research on unmanned aircraft systems. At headquarters, he gave a presentation to personnel involved in the development of rulemaking for unmanned aircraft systems. His focus was on research that supports development of unmanned aircraft pilot medical and airman qualifications. He also discussed research efforts planned for FY06 and 07. During his meeting at Aurora Flight Sciences, he discussed control interfaces used by unmanned aircraft pilots. This review is part of an effort to inventory control interfaces currently in use across a variety of systems. The inventory will assist in development of standards and guidelines for unmanned aircraft. *This research activity supports the Administrator's Flight Plan Goal for Increased Safety, Objective 2: Reduce the number of fatal accidents in general aviation* (K. Williams, CAMI)

*More information on human factors research can be found at the FAA Human Factors (ATOP-R&D) web site: <http://www.hf.faa.gov>*

Paul Krois  
FAA (ATO-P R&D Human Factors)



**October 17-21, 2005** - American Association for Aerosol Research 2005 Annual Conference, Hilton Austin, Austin, TX <http://www.cdc.gov/niosh/exhibits.html>

**October 18-20, 2005** - S-9 Cabin Safety Technical Committee Meeting, Phoenix, AZ, [mlemank@sae.org](mailto:mlemank@sae.org)

**October 18-21, 2005** - [2005 SAE Control & Guidance Systems Committee Meeting No. 96](#)  
Harbor Town Resorts, Hilton Head, South Carolina, USA

**October 20-21, 2005** – 2<sup>nd</sup> Annual FAA International Safety Forum, Westfields Marriott,  
Chantilly, VA <http://www.faa.gov/news/conferences/safetyforum/index.cfm?topic=6>.

**October 22-26, 2005** – American Medical Informatics Association Annual Symposium, Hilton  
Washington, Wash, DC <http://www.amia.org/meetings/annual/current/>

**October 23-26, 2005** - UIST 2005, Eighteenth Annual ACM Symposium on User Interface  
Software and Technology, Seattle, WA <http://www.acm.org/uist/index.html>

**October 24-25, 2005** – National Academies Institute of Medicine Annual Meeting, National  
Academy of Sciences, Washington, *DC* <http://wwwsearch.nationalacademies.org/>

**October 24-26, 2005** – 43<sup>rd</sup> SAFE Symposium, Grand America Hotel, Salt Lake City, UT  
<http://www.safeassociation.org/symposium.htm>

**October 24-27, 2005** - [DoD Maintenance Symposium & Exhibition](#)  
Sheraton Birmingham Hotel and Birmingham-Jefferson Convention Complex, Birmingham,  
Alabama,

**October 25-26, 2005** - 2005 International Symposium: Beyond Regulatory Compliance, Making  
Safety Second Nature, Reed Arena, Texas A&M University, College Station, TX  
<http://www.cdc.gov/niosh/exhibits.html>

**October 26-28, 2005** – Air Cargo Americas, Radisson Centre, Miami, FL  
[www.aircargoamericas.com](http://www.aircargoamericas.com)

**October 26-28, 2005** - A-10 Aircraft Oxygen Equipment Committee Meeting, Salt Lake City,  
UT [mlemank@sae.org](mailto:mlemank@sae.org)

**October 27-28, 2005** - Second International Conference on Knowledge Management  
ICKM2005, Westin Charlotte, Charlotte, NC <http://www.asis.org/ICKMcall.htm>

**October 30-November 7, 2005** – ATCA 50<sup>th</sup> Annual Conference and Exposition, Dallas, TX  
[http://www.atca.org/event\\_items.asp](http://www.atca.org/event_items.asp).

**October 30—November 3, 2005** – 24<sup>th</sup> Digital Avionics Systems Conference, Hyatt Regency  
Crystal City, Wash., DC <http://www.dasconline.org>

**November, 2005** – DoD TAG (Human Factors Engineering Technical Advisory Group)  
Meeting, Baltimore, MD <http://hfetag.dtic.mil/meetschl.html>

**November 3-5, 2005** - AOPA Expo, Tampa, Florida [www.aopa.org](http://www.aopa.org)

**November 3-5, 2005** - Conference on Designing for User Experience, Fort Mason, San Francisco, CA <http://www.dux2005.org/>

**November 6-9, 2005** - ACI World / Pacific Conference and Exhibition, Auckland, New Zealand. [www.auckland-airport.co.nz](http://www.auckland-airport.co.nz)

**November 7-9, 2005** – DoD TAG, Baltimore, MD <http://hfetag.dtic.mil/meetschl.html>

**November 7-10, 2005** – Flight Safety Foundation 58<sup>th</sup> Annual International Air Safety Seminar, Moscow, Russia [http://www.flightsafety.org/iass05\\_cfp.html](http://www.flightsafety.org/iass05_cfp.html)

**November 7-10, 2005** - Ergonomics and Human Factors: Applications in Occupational Safety and Health, Harvard School of Public Health, Cambridge, MA  
<http://www.hsph.harvard.edu/ccpe/programs/EHF.shtml>

**November 8-10, 2005** – Aerospace Testing Expo, North America: Scientific Conference and Technology Forum, Long Beach Convention Center, Long Beach, CA  
<http://www.aerospacetesting-expo.com/northamerica/conf+forum.html>

**November 8-10, 2005** – Maintenance, Repair & Overhaul Exhibition Asia, Suntec Convention Center, Singapore <http://www.aviationnow.com/conferences/masmain.htm>

**November 10, 2005** - 34th Annual Meeting of the Society for Computers in Psychology, Toronto, Ontario, Canada <http://www.scip.ws>

**November 10 - 13, 2005** - 46th Psychonomic Society Annual Meeting, Toronto, Ontario, Canada <http://www.psychonomic.org/meet.htm>

**November 15-17, 2005** - National Business Aviation Association's 58th Annual Meeting & Convention, New Orleans, LA (TBD) [www.nbaa.org](http://www.nbaa.org)

**November 16-17, 2005** – IEE Human Factors Engineering Professional Network/MoD Human Factors Integration Defense Technology Center “People and Systems Symposium: Who Are We Designing For?”, Grange City Hotel London, UK <http://conferences.iee.org/pas2005>

*November 28-29, 2005 – Joint FAA/Association of Asia Pacific Airlines Workshop on Human Factors in Engineering and Maintenance, Prince Hotel, Kuala Lumpur*  
[http://www.aapairlines.org/content/events/HumanFactorWS/HF2005\\_Flyer.pdf](http://www.aapairlines.org/content/events/HumanFactorWS/HF2005_Flyer.pdf)

*November 28-30, 2005 – European Aviation Conference, Nice, France*  
<http://www.everestevents.co.uk/events.asp?eventID=39>

*December 6-8, 2005 – US Air Force T&E Days, Gaylord Opryland Hotel, Nashville, TN*  
<http://www.aiaa.org/content.cfm?pageid=230&lumeetingid=1297>

*December 6-8, 2005 – NASA Sixth Annual Risk Management Conference, Disney Coronado Resort, Orlando, FL <http://rmc.nasa.gov/>*

**January 9-12, 2006** - 44th AIAA Aerospace Sciences Meeting and Exhibit, Reno Hilton, Reno, NV <http://www.aiaa.org/>

**January 21-25, 2006** – ASHRAE Winter Meeting and Expo, Chicago, IL <http://www.ashrae.org/template/AssetDetail/assetid/45794>

**January 22-26, 2006** – TRB 85<sup>th</sup> Annual Meeting, Washington, DC <http://trb.org/calendar/>

**January 23-27, 2005** - S-18 Safety Assessment for Airborne Systems & Equipment San Antonio, TX, [lemon@sae.org](mailto:lemon@sae.org)

**February 9-10, 2006** - Swinburne University Symposium on Safety Management and Human Factors Symposium, Melbourne, Australia [janca@groupwise.swin.edu.au](mailto:janca@groupwise.swin.edu.au)  
<http://www.swin.edu.au/aviation/forms/2006SwinburneSymposiumCallforPapers.pdf>

**February 21-26, 2006** – Asian Aerospace 2006, Changi Exhibition Centre, Singapore [www.asianaerospace.com](http://www.asianaerospace.com)

**February 26-28, 2006** – Heli-Expo, Dallas, TX <http://www.heliexpo.com>

*February 28 – March 1, 2006 – 31<sup>st</sup> Annual FAA Aviation Forecast Conference, Wash, DC [http://www.faa.gov/news/conferences/aviation\\_forecast\\_2006/](http://www.faa.gov/news/conferences/aviation_forecast_2006/).*

**March 13-15, 2006** – Flight Safety Foundation 18<sup>th</sup> Annual European Aviation Safety Seminar, Athens, Greece <http://www.flightsafety.org/seminars.html#eass>

**March 20-23, 2006** – 16<sup>th</sup> Annual AAMI/FDA International Conference on Medical Device Standards and Regulation, Hyatt Regency, Reston, VA <http://www.aami.org/meetings/isc/index.html>

**March 22 - 25, 2006** - Society for Behavioral Medicine Annual Meeting and Scientific Sessions, San Francisco, CA [www.sbm.org/annualmeeting/index.html](http://www.sbm.org/annualmeeting/index.html)

**March 23-25, 2006** - 17th Annual International Women in Aviation Conference, Opryland Hotel Nashville, TN <http://www.wai.org/>

**March 23-27, 2005** – IA Summit 2006, Hyatt Regency, Vancouver, BC, Canada <http://www.iasummit.org/>

**March 28-30, 2006** – Aviation Industry Expo, Las Vegas, NV <http://www.aviationindustryexpo.com>

**April 4-10, 2006** – Sun ‘n Fun, Lakeland, FL <http://www.sun-n-fun.org/content/>

**April 6-7, 2006** – National Human Capital Summit, Chicago Marriott Downtown, Chicago, IL  
[http://www.humancapitalinstitute.net/conference\\_national.html](http://www.humancapitalinstitute.net/conference_national.html)

**April 22-27, 2006** – CHI 2006, Montreal, Quebec, Canada  
<http://www.chi2006.org/call/hcioverviews.php>

**April 23-28, 2006** - Avionics Systems Division Meeting, New Orleans, LA (TBD)  
[lemon@sae.org](mailto:lemon@sae.org)

**April 25-27, 2006** – Maintenance, Repair & Overhaul (MRO) Conference & Exhibition,  
Phoenix Civic Plaza, Phoenix, AZ <http://www.aviationnow.com/conferences/mromain.htm>

**May 1-4, 2006** - 47th AIAA/ASME/ASCE/AHS/ASC Structures, Structural Dynamics, and  
Materials Conference; 14th AIAA/ASME/AHS Adaptive Structures Conference;  
7th AIAA Gossamer Spacecraft Forum; 2nd AIAA Multidisciplinary Design Optimization  
Specialist Conference; 1st AIAA Non-Deterministic Approaches Conference, Hyatt Regency  
Newport, Newport, RI <http://www.aiaa.org/>

**May 9-11, 2006** – Flight Safety Foundation 51<sup>st</sup> Annual Corporate Aviation Safety Seminar,  
Phoenix, AZ <http://www.flightsafety.org/seminars.html#eass>

**May 14-18, 2006** - 77<sup>th</sup> Annual Scientific Meeting of the Aerospace Medical Association, Caribe  
Royale Hotel, Orlando, FL <http://www.asma.org/>

**May 15-16, 2006** – DoD TAG, Las Vegas, NV <http://hfetag.dtic.mil/meetschl.html>

**May 17-19, 2006** – 17<sup>th</sup> International Conference on Heating and Ventilation, Prague, Czech  
Republic <http://www.acv2006.cz>

**May 22-24, 2006** - 9th IFAC Symposium on Automated Systems Based on Human Skill And  
Knowledge, Nancy, France <http://www.cdc.gov/niosh/exhibits.html>

**May 25-28, 2006** – American Psychological Society 18<sup>th</sup> Annual Convention, New York  
Marriott Marquis, New York City, NY <http://www.psychologicalscience.org/convention/>

**June 11-14, 2006** – The American Society of Safety Engineers Safety 2006 Conference,  
Washington State Convention and Trade Center, Seattle, WA  
<http://www.asse.org/2006pdcallforpapers.pdf>

**June 12-16, 2006** – UPA 2006 – 15<sup>th</sup> Annual Conference, Broomfield, CO  
[http://www.usabilityprofessionals.org/conferences\\_and\\_events/upa\\_conference/2006/](http://www.usabilityprofessionals.org/conferences_and_events/upa_conference/2006/)

**June 24-26, 2006** – AAMI Conference & Exposition, Wash, DC  
<http://www.aami.org/proposals/index.html>

**June 24-28, 2006** – ASHRAE Annual Conference, Quebec, Canada <http://www.ashrae.org/>

**June 26-29, 2006** - [General Aviation Technology Conference](#) , Hyatt Hotel, Wichita, Kansas,

**July, 2006** - 26th International Congress of Applied Psychology, Athens, Greece

[dgeorgas@dp.uoa.gr](mailto:dgeorgas@dp.uoa.gr) ,

[http://www.erasmus.gr/dynamic/conventions.asp?conv\\_id=21r/dynamic/conventions.asp?conv\\_id=21](http://www.erasmus.gr/dynamic/conventions.asp?conv_id=21r/dynamic/conventions.asp?conv_id=21)

**July 10-14, 2006** – IEA 2006, 16<sup>th</sup> World Congress on Ergonomics, Maastricht, The Netherlands  
<http://www.iea2006.org/>

**July 24-30, 2006** – EAA AirVenture, Oshkosh, WI <http://www.airventure.org/>

**August 10-13, 2006** – American Psychological Association Annual Meeting, New Orleans, LA  
<http://www.apa.org/convention05/future.html>

**August 21-24, 2006** - AIAA Modeling and Simulation Technologies Conference and Exhibit.  
Keystone Resort and Conference Center, Keystone, CO  
<http://www.aiaa.org/content.cfm?pageid=1>

**August 21-24, 2006** - AIAA Guidance, Navigation, and Control Conference and Exhibit,  
Keystone Resort and Conference Center, Keystone, CO  
<http://www.aiaa.org/content.cfm?pageid=1>

**September 6-8, 2006** - 11th AIAA/ISSMO Multidisciplinary Analysis and Optimization  
Conference, Renaissance Portsmouth, Portsmouth, VA,  
<http://www.aiaa.org/content.cfm?pageid=1>

**September 10-14, 2006** - 54th International Congress of Aviation and Space Medicine,  
Bangalore, India. A preliminary registration form may be found at <http://www.isam-india.org/conference44/newreg.php>.

**September 26-27, 2006** – AIAA Aviation Technology, Integration and Operations Conference,  
Hyatt Regency, Wichita, KS <http://www.aiaa.org/content.cfm?pageid=1>

**October 15-19-2006** – Digital Avionics Systems Conference, Hilton Portland, Portland, OR  
<http://www.dasconline.org/>

**September 25-27, 2006** - 6th AIAA Aviation Technology, Integration and Operations Forum,  
Hyatt Regency Wichita, Wichita, KS <http://www.aiaa.org/content.cfm?pageid=1>

**October 23-25, 2006** – 44<sup>th</sup> Annual SAFE Symposium, Reno Hilton Hotel, Reno, NV  
<http://www.safeassociation.org/symposium.htm>

**October 23-26, 2006** - DoD Maintenance Symposium & Exhibition, Reno Hilton, Reno, Nevada <http://www.sae.org/events/conferences/aerospace/>

**January 8-11, 2007** - 45th AIAA Aerospace Sciences Meeting and Exhibit, Reno Hilton, Reno, NV <http://www.aiaa.org/content.cfm?pageid=1>

**July 22-27, 2007** – 12<sup>th</sup> HCI International, Beijing, China <http://www.hcii2007.org/>

*Note: Calendar events in Italics are new since the last Newsletter*



Comments or questions regarding this newsletter?  
Please contact Bill Berger at (334) 271-2928  
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