ATOP-R&D

Human Factors Newsletter # 05-07

April 9, 2005 – April 22, 2005

Articles in this newsletter:

New Appointment for Dr. Mark Rodgers: At a recent ATO-P "all-hands" meeting, Charlie Keegan, Vice President, Operations Planning, announced his intention to appoint Mark Rodgers as the permanent systems engineering director. Mark has been the acting director for several months. Congratulations!

Technical Note: Willems, B., Heiney, M., & Sollenberger, R. (2005, February). Study of an ATC Baseline for the Evaluation of Team Configurations: Information Requirements. (DOT/FAA/CT-TN02/04). Atlantic City International Airport, NJ: DOT/FAA. William J. Hughes Technical Center.

Executive Summary

In the current Air Traffic Control (ATC) system, strategic planning occurs at the national (Systems Command Center) and facility (Traffic Management Unit) levels. NASA, EUROCONTROL, and MITRE have proposed establishing a new strategic position at the multi-sector level, thus creating a multi-layered ATC system. This new multi-sector position would involve using an Air Traffic Control Specialist (ATCS) with strategic planning responsibilities at

the sector/multi-sector level within the en route ATC environment. Proposed benefits of the new position include improved safety and efficiency of the National Airspace System (NAS).

The proposals for the multi-sector planning position involve a range of roles and responsibilities, from minor modifications to current operational positions (e.g., upstream and downstream Data (D)-side planners), to a position that would actually communicate control actions to aircraft (e.g., multi-sector planner) (Leiden & Green, 2000). Although originally proposed for use with the implementation of automated Decision Support Tools (DSTs), this is a concept that could have immediate operational benefits in the current environment. In addition, if such a position were in use, it might assist in shifting from tactical to more strategic ATC as the automated DSTs become available. However, none of the research groups have conducted an operational assessment of a multi-sector position.

A research team from the FAA's William J. Hughes Technical Center conducted a series of simulations documenting findings for the impact of a multi-sector position. ATO-P, R&D funded the simulations. In this study, researchers focused on how a change in team configuration may benefit ATC without decision support automation. A second and a third study focused on information requirements for, and the effect of, the physical location of an airspace coordinator respectively.

The team conducted a human-in-the-loop simulation to assess the effectiveness of the new position in maintaining safety and improving the efficiency of controlling air traffic. They selected two candidate sets of roles and responsibilities for a multi-sector position: Upstream D-side and Airspace Coordinator. The effects of the two multi-sector positions were assessed to determine if either has operational benefits in the current operational environment. Next, the information needs of both multi-sector positions were systematically explored through objective and subjective measures. In addition, the types of information used by ATCSs working both positions were evaluated through examining the information they accessed in the current system (e.g., number of route readouts, number of quick-looks), eye movement data, and communications with other sector ATCSs.

Thirty ATCSs from Air Route Traffic Control Centers within the United States voluntarily participated in the experiment. The research team used the Technical Center's Target Generation Facility and a Display System Replacement (DSR) emulator. The ATCS environment included full DSR emulations with all operational functions. ATCSs controlled traffic in a human-in-the-loop simulation in three operation team configurations and under low and high task loads. ATCSs, in teams of three, acted as: (1) three individual Radar (R)-side ATCSs; (2) two R-side ATCSs with an Upstream D-side assisting the one R-side ATCS; or (3) two R-side ATCSs with a shared Airspace Coordinator assisting both sectors. Each ATCS was assigned to a particular position in which he or she remained for all scenario runs (i.e., North or South R-side ATCS or Experimental Position). A generic airspace with instrument flight rules was used to avoid restricting the size of the participant pool to a specific area and to make findings more general (Guttman, Stein, & Gromelski, 1995). ATCSs received training on the generic airspace and all equipment used in the simulation prior to experimental runs.

Researchers used a standard set of measures to assess performance, visual scanning, communications, situation awareness (SA), and workload of ATCSs as they worked in the new team configurations. They compared ATC performance and behavior under the three operational team configurations, three ATCS positions, and two task load levels. Specifically, the Data Reduction and Analysis Tool (DRAT) provided performance measures such as number of conflicts and length of time aircraft were in a sector. An eye-tracking system collected visual scanning data for the experimental ATCS (i.e., the ATCS who rotated between the R-side, Upstream D-side, and Airspace Coordinator positions). Push-to-talk (PTT) software was used to examine land line and ground-to-air communications. SA was assessed using self-report measures and over-the-shoulder (OTS) ratings made by ATC Subject Matter Experts (SMEs). Workload ratings were obtained from a Workload Assessment Keypad (WAK), NASA Task Load Index (TLX), and self-report measures. Post-Scenario Questionnaires provided self-report data from the ATCSs, and OTS ratings provided subjective performance data.

Both objective ATCS interaction and DRAT information and subjective self-report data indicated that when in the Upstream D-side or Airspace Coordinator configurations, the Experimental ATCSs strategically set up traffic for the R-side ATCSs they assisted. In the Upstream D-side configuration, the North R-side ATCSs performed fewer route changes and assigned altitudes. The Experimental Position assisted the North R-side by directly performing these actions. The number of route changes did not differ for the South R-side ATCSs. The North R-side ATCSs cancelled interim altitudes significantly less in the Upstream D-side or Airspace Coordinator configurations, and the number of interim altitude changes was significantly lower in the Airspace Coordinator configuration, particularly under low task-load conditions. The North R-side ATCSs performed more flight plan readouts in the R-side configuration compared to the Upstream D-side configuration. For all ATCSs, more route readouts occurred in the R-side configuration than the Airspace Coordinator configuration. When acting as an Airspace Coordinator, ATCSs indicated that they dropped aircraft to lower flight altitudes or sent them direct, thereby taking them out of the North or South sectors. Although there was evidence of the more strategic oriented control tasks of the Experimental ATCSs in the Upstream D-side or Airspace Coordinator configurations, OTS SMEs rated the R-side ATCSs' performance lower in these configurations. The research team predicted the use of a multi-sector position would offset the increase in airspace. However, they did not find support for this in the data. In fact, the increase in airspace might have made it more difficult to find support for this. North and South R-side ATCSs indicated higher workloads as measured by WAK, NASA TLX, or self-reported, in the multi-sector configurations.

The number of ground-to-air communications increased for the R-side ATCSs when a multi-sector position was present. The North R-side ATCSs compensated for the increased number or communications by decreasing the duration of the communication. However, for the team of ATCSs, team configuration and task load attenuated the number of communications. The Experimental ATCSs communicated more with the R-side ATCSs in the Upstream D-side configuration. In the Airspace Coordinator configuration, the Experimental ATCSs communicated more with the ghost ATCSs. The absolute number of calls was much higher to the ghosts. This may be an artifact of the study. Experimental ATCSs knew that the ghosts would approve any changes they requested.

The visual scanning results show that the Experimental Position in either the R-side or Airspace Coordinator configuration predominantly used the radar display to obtain control information and to provide structure in the scan. In contrast, when in the Upstream D-side position, Experimental ATCSs obtained control information from the radar display, D-side computer readout device, and Flight Progress Strips. As an Upstream D-side, ATCSs spent more time transitioning between scene planes and were able to pick up less information because of this. As an Upstream D-side, the Experimental ATCSs' mean fixation durations were lower, implying that they spent more time reading the other displays.

Significant effects for task load were found. The ATCSs SA was lower under high task loads. ATCSs issued more ground-to-air communications, although durations of these communications were shorter for at least the North R-sides. Under high task loads, ATCSs reported higher workload levels, and SMEs rated their performance lower. The more traffic ATCSs have to control, the more resources they used and the more control actions they issued, thus increasing their workload and lowering their SA.

Researchers did find some effects for the position ATCSs worked. When in the R-side configuration, Experimental ATCSs devoted more mental resources to search for potential aircraft conflicts. In the Airspace Coordinator configuration, they devoted more mental resources to search for direct routes. This finding reflects the differences between tactical and strategic control responsibilities. Some position effects were related to the increased number of aircraft in the North sector. North R-side ATCSs had higher workload ratings and tended to perform more control actions.

Overall, ATCSs were more favorable towards the position of the Airspace Coordinator who coordinated control actions through R-side ATCSs compared to a multi-sector planner who would directly communicate control actions to aircraft. They felt that an Airspace Coordinator would improve safety, increase efficiency, evenly distribute workload, and be more helpful and less interfering. Further, the Experimental ATCSs rated the direct routing advisory automation functions as important for an Airspace Coordinator as a conflict probe or conflict resolution function. North and South R-side ATCSs viewed only the conflict probe and conflict resolution functions as important.

Results indicate that a strategic multi-sector position can be introduced into the current DSR environment. The Airspace Coordinator's roles and responsibilities may have a slight advantage over the Upstream D-side's roles and responsibilities because there was a tendency for the Upstream D-side to revert to more tactical control responsibilities, particularly under high task loads. To fully maximize the efficiency of a multi-sector position, Decision Support Tools would need to be implemented.

This research supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 1: Increase capacity to meet projected demand.

Point of Contact: E, Stein, WJHTC

Technical Information: Human Factors Reports Database

The Human Factors Reports Database has over 1200 articles from 29 different sources, including CAMI, NASA and EUROCONTROL. There are also articles from research conducted at several universities. To access the reports, point to: www.hf.faa.gov/Workbench/search.aspx. The database is updated regularly, and we will keep you informed about the latest articles. Each month we will list articles that have been added to the database. Here is a list of recent additions:

Durso, F. T.; Batsakes, P. J.; Crutchfield, J. M.; Braden, J. B.; Manning, .C A. (2004). The Use of Flight Progress Strips while Working Live Traffic: Frequencies, Importance and Perceived Benefits. http://www.hf.faa.gov/Workbench/techrptdetails.aspx?id=1418

Krois, P.; Rehmann, J. (2005). Assessing Human Factors Risks in Air Traffic Management Research. http://www.hf.faa.gov/Workbench/techrptdetails.aspx?id=1424

Major, L. M.; Hansman, JR., R. J. (2004). Human-Centered Systems Analysis of Mixed Equipage in Oceanic Air Traffic Control.
http://www.hf.faa.gov/Workbench/techrptdetails.aspx?id=1416

Major, L.; Johannsson, H.; Davison, H. J.; Hvannberg, E. T.; Hansman, R. J. (2004). Key Human-Centered Transition Issues for Future Oceanic Air Traffic Control Systems.
http://www.hf.faa.gov/Workbench/techrptdetails.aspx?id=1415

Sheridan,T.; Cardosi, K.; Hannon, D. (2004). Rating the Severity of Close-Call Events.
http://www.hf.faa.gov/Workbench/techrptdetails.aspx?id=1417

This initiative supports the Administrator's Flight Plan Goal for Organizational Excellence, Objective 3: Make decisions based on reliable data to improve our overall performance and customer satisfaction

Point of Contact: Dino Piccione, ATO-P R&D

Cooperative Research Grant: The FAA (ATO-P R&D Human Factors) is awarding a new cooperative research grant to the University of Texas at Austin:

Normal Operations Safety Survey (NOSS): Adapting the Line Operations Safety Audit (LOSA) Methodology to Air Traffic Control

Grant Summary. The University of Texas Human Factors Project (UTHF) has conducted aviation research for more than 25 years. Work in the last ten years has focused on the development of the Line Operations Safety Audit (LOSA). Premised on the concepts of Threat and Error Management (TEM), LOSA provides a means of collecting safety data during normal operations. Recognizing the contributions of LOSA and TEM to flight operations safety, industry personnel are calling for the adaptation of TEM to other components of the aviation

system. For example, ICAO has established a formal working group, of which UTHF is a member, dedicated to adapting TEM and LOSA principles to Air Traffic Management (ATM).

The aim of the research in this proposal is to develop the Normal Operations Safety Survey (NOSS) for ATM. To do that, the TEM model must first be suitably adapted to ATC. UTHF will then develop an initial NOSS methodology including an observer training curriculum, data collection forms, and observation protocol. The initial methodology will be piloted by Nav Canada, Airservices Australia, and Airways New Zealand at their own expense with donated expertise from UTHF. These trials will allow for the assessment of reliability and validity, and provide feedback on the initial NOSS methodology.

The methodology will then be revised based on the lessons learned from the trial projects for a potential trial at an FAA center.

This research supports the Administrator's Flight Plan Goal for Increased Safety, Objective 7: Enhance the safety of FAA's air traffic systems.

Point of Contact: Larry Cole (ATO-P R&D)

En Route ATC: Personnel at the William J. Hughes Technical Center's Research and Development Human Factors Laboratory have scheduled early shake-down runs on the current Future En Route Workstation concept. An initial simulation study is scheduled to begin early in May and will run two months with 16 volunteer participants. *This research supports the Administrator's Flight Plan Goal for Greater Capacity, Objective 3: Increase on-time performance of scheduled carriers. (B. Willems, WJHTC)*

HFACS: On April 5-6, 2005, Scott Shappell provided a series of presentations at the FAA Flight Safety Officer Recurrent Technical Training Seminar in Henderson, Nevada. The topics included a review of the Human Factors Analysis and Classification System (HFACS). HFACS was developed as a taxonomic system to categorize both the latent and immediate causal factors that have been identified in aviation accidents. Its purpose is to provide a framework for use in aviation accident investigations and as a tool for assessing accident trends. Discussions of human factors associated with general aviation controlled-flight-into-terrain accidents, Alaskan aviation accidents, and commercial aviation accidents were also included. *This research supports the Administrator's Flight Plan Goal for Increased Safety, Objectives 1, 2 and 3: Reduce the commercial fatal accident rate; Reduce the number of fatal accidents in general aviation; Reduce accidents in Alaska.* (D. Schroeder, CAMI)

En Route Information Display System: On April 15, 2005, engineering research psychologists from the William J. Hughes Technical Center's NAS Human Factors Group, and Titan Systems visited Boston Air Route Traffic Control Center (ARTCC) to become familiar with the En Route Information Display System (ERIDS). The researchers are interested in assessing the benefits of ERIDS from a controller perspective, focusing on potential workload reduction and convenience compared to alternative methods of information access. Airway Facility and Air Traffic experts were interviewed to determine how controllers are using the system, what information is available to controllers, and how the system has been customized for the facility. The

researchers received a demonstration of ERIDS in the facility dynamic simulation laboratory and observed controllers using the system during live operations. *This research supports the Administrator's Flight Plan Goal for Increased Safety, Objective 7: Enhance the safety of FAA's air traffic systems.* (E. Stein, WJHTC)

TFM: On April 21, 2005, personnel from the William J. Hughes Technical Center's NAS Human Factors Group attended the System Design Review for Traffic Flow Management - Modernization (TFM-M). One of the goals of TFM-M is to replace the existing Traffic Situation Display (TSD). The TSD is used by Traffic Management Specialists in the field for strategic planning and analysis of air traffic flows. The NAS Human Factors Group will work with the program office and the vendor to ensure that the new interface supports all existing capabilities and addresses existing usability problems. *This research supports the Administrator's Flight Plan Goal for Increased Safety, Objective 7: Enhance the safety of FAA's air traffic systems.* (E. Stein, WJHTC)

News Briefs:

- **Technical Center Outreach:** On April 14, 2005, William J. Hughes Technical Center personnel served as judges at the Delaware Valley Science Fair held in the Ft. Washington Expo Center on the west side of Philadelphia. Drexel University sponsors the fair. Students from elementary, middle, and high schools competed. In order to qualify for this year's competition, contestants had already won at one of the 12 local science fairs in Delaware, Southern New Jersey, and Southern Pennsylvania. (Sehchang Hah, WJHTC)

- **Aerospace Medicine:** On April 18-21, 2005, Dave Schroeder participated in the Federal Air Surgeon's management team meeting that was held in Boston, MS. He provided a briefing on the 2005 Aviation Medical Examiner's survey during the meeting. As part of the Office of Aerospace Medicine awards ceremony, CAMI's Aerospace Human Factors Research Division received the AAM Office of the Year Award. Dr. Schroeder received the AAM Manager of the Year Award and Dr. Nelda Milburn received the W.E. Collins Publication Award (technician). (D. Schroeder, CAMI))

- **2005 National Aviation Research Plan Now On-Line**: To access, point to: http://172.27.70.66/nasiHTML/RED/narp05/index1.html.

- **Key Meeting:** On May 9-12, 2005, scientists from CAMI's Aerospace Human Factors Research Division will participate in the 76th Scientific Meeting of the Aerospace Medical Association in Kansas City, MO. In addition to serving as chairs of several scientific sessions, CAMI personnel will make 11 presentations and conduct one workshop during the meeting. Scott Shappell served as chair of the Scientific Program Committee for the meeting. (D, Schroeder, CAMI)

- **Corporate Culture:** On April 18, 2005, Scott Shappell presented the keynote address at the Interagency Committee for Aviation Policy (ICAP) Aviation Safety Officer (ASO)

workshop in Reno, NV. The title of his talk was, “Corporate Culture and Human Factors.” (D. Schroeder, CAMI)

- **ATO Vision**: Did you know the ATO vision is: To improve continuously the safety and efficiency of aviation, while being responsive to our customers and accountable to the public. The ATO stands for safety, service, and value. You can find a one-page overview of the ATO’s vision and values at http://ato.faa.gov/DesktopModules/ViewDocument.aspx?DocumentID=106.

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)

April 26-28, 2005 – Flight Safety Foundation 50th Annual Corporate Aviation Safety Seminar, Orlando, FL http://www.flightsafety.org/cass05_preagenda.html

April 27-30, 2005 - Aircraft Electronics Association Convention & Trade Show, Gaylord Texan Resort, Grapevine, Texas www.aea.net

April 28-29, 2005- Mini-Conference on Human Factors in Complex Sociotechnical Systems, hosted by HFES South Jersey Chapter, Atlantic City, NJ, http://www.sjhfes.org/

May 9-12, 2005 - 76th Annual Scientific Meeting of the Aerospace Medical Association, Kansas City, MO *http://www.asma.org/*

May 14-15, 2005 – 8th Alaska State Aviation Trade Show and Conference, Anchorage International Airport, Anchorage, AK http://www.alaskaairmen.com/

May 17-18. 2005 – Aviation Maintenance & Human Factors Workshop & Symposium, Crowne Plaza, Arlington, TX exhibitions@sae.org

May 18-20, 2005 - International Applied Reliability Symposium, Catamaran Resort on Mission Bay in San Diego, California. Symposium Theme: "Sharing applications, success stories and lessons learned in reliability and maintainability engineering." Visit the Web site http://www.ARSymposium.org/ for detailed information on topics, presenters and registration.

You can also download the brochure at:
http://www.ARSymposium.org/2005/ars2005_brochure.pdf

May 18-20, 2005 – EBACE 2005 – 5th Anniversary, Geneva Palexpo, Geneva International Airport, Switzerland www.ebace.aero

May 23-24, 2005 – PROP Europe 2005, Frankfurt, Germany
http://www.turbineair.com/prop.html

May 23-26, 2005 – DoD TAG (Human Factors Engineering Technical Advisory Group), Marriott Bay Point Resort Golf and Yacht Club, Panama City, FL
http://hfetag.dtic.mil/meetschl.html

May 25-26, 2005 – Military Aviation Repair & Maintenance 2005, One Whitehall Place, London, UK http://www.iqpc.co.uk/GB-2361/1010

May 26-29, 2005 – American Psychological Society 17th Annual Convention, Westin Century Plaza Hotel, Los Angeles, CA http://www.psychologicalscience.org/convention/

June 2005 – 6th USA/Europe ATM Seminar, Baltimore, MD (note: call for papers deadline is January 28, 2005) http://atmseminar.eurocontrol.fr/

June 4, 2005 – AOPA Fly-in and Open House, Frederick, MD http://www.aopa.org/

June 7-9, 2005 - Europe-US International Safety Conference, Cologne, Germany, hosted by the FAA and JAA http://www.easa.eu.int/conference2005/.

June 13-19, 2005 - Paris Air Show 2005, Parc des expositions de Paris Nord - Le Bourget, 93350, France. www.paris-air-show.com

June 20-22, 2005 – 3rd Human System Integration Symposium, Sheraton National Hotel, Arlington, VA http://www.navalengineers.org/Events/HSIS2005/HSIS05Index.html

June 27-30, 2005 – TRB 3rd International Driving Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design, Rockport, Maine

June 28-30, 2005 – AAMI Human Factors, Ergonomics, and Patient Safety for Medical Devices, Capital Hilton, Washington, DC http://www.aami.org/meetings/hf/

July 22-28, 2005 – HCI International 2005, 11th International Conference on Human-Computer Interaction, Caesars Palace, Las Vegas, NV hcii2005@ecn.purdue.edu

July 25-31, 2005 – EAA AirVenture Oshkosh 2005, Oshkosh, WI http://www.airventure.org

August 15-18, 2005 - 43rd AIAA Aerospace Sciences Meeting and Exhibit, Hyatt Regency San Francisco at Embarcadero Center, San Francisco, CA http://www.aiaa.org/

August 18-21, 2005 - 113th Convention of the American Psychological Association, Wash, DC http://www.apa.org/convention

August 22-26, 2005 – SAE G-10 (Behavioral Engineering Technology Committee Meeting, Washington, DC http://forums.sae.org/access/dispatch.cgi/TEAG10_pf

September 12-16, 2005 – Interact 2005, Tenth IFIP TC13 International Conference on Human-Computer Interaction, Rome, Italy http://www.interact2005.org/

September 19-23, 2005 – ANA 2005 Aviation Conference and Exhibition, Connecticut Convention Center, Hartford. CN *http://www.aerospace-na.com/ace2005.asp*

September 20-21, 2005 - R,E&D Advisory Committee Meeting (joint meeting with NASA's Aerospace Research Advisory Committee), Bessie Coleman Auditorium, FAA Headquarters, Wash., DC Gloria.dunderman@faa.gov

September 21-23, 2005 - Cargo Facts 2005- 11th Annual Aircraft Symposium, Sheraton Hotel & Towers, Seattle, Washington ashoemaker@cargofacts.com

September 25-28, 2005 - 11th Ka and Broadband Communications Conference and 23rd AIAA International Communications Satellite Systems Conference 2005 (organized by IIC), Aurelia Convention Center, Rome, Italy http://www.aiaa.org/

September 26-28, 2005 - AIAA 5th Aviation, Technology, Integration, and Operations Forum (ATIO), Hyatt Regency Crystal City, Arlington, VA http://www.aiaa.org/

September 26-28, 2005 - AIAA 2nd Intelligent Systems Conference (IS), Hyatt Regency Crystal City, Arlington, VA http://www.aiaa.org/

September 26-30, 2005 – Human Factors and Ergonomics Society 49th Annual Meeting, Royal Pacific Resort at Universal Orlando, Orlando, FL *http://hfes.org/meetings/menu.html*

October 3-6, 2005 – SAE 2005 AeroTech Congress and Exhibition, Gaylord Texan Resort and Convention Center, Dallas/Fort Worth Airport Area, Texas
http://www.sae.org/events/conferences/aerospace/

October 6-9, 2005 – Aviation North Expo Conference, Fairbanks Princess Riverside Lodge, Fairbanks, AK *www.AviationNorth.org*

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 – 43rd SAFE Symposium,Grand America Hotel, Salt Lake City, UT http://www.safeassociation.org/symposium.htm

October 30-November 7, 2005 – ATCA 50th Annual Conference and Exposition, Dallas, TX http://www.atca.org/event_items.asp.

October 30—November 3, 2005 – 24th 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

November 6-9, 2005 - ACI World / Pacific Conference and Exhibition, Auckland, New Zealand. www.auckland-airport.co.nz

November 7-10, 2005 – Flight Safety Foundation 58th Annual International Air Safety Seminar, Moscow, Russia http://www.flightsafety.org/iass05_cfp.html

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 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 www.nbaa.org

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

January 22-26, 2006 – TRB 85th Annual Meeting, Washington, DC http://trb.org/calendar/
May 14-18, 2006 - 77th Annual Scientific Meeting of the Aerospace Medical Association, Orlando, FL http://www.asma.org/

March 22 - 25, 2006 - Society for Behavioral Medicine Annual Meeting and Scientific Sessions, San Francisco, CA 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/

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

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

July, 2006 - 26th International Congress of Applied Psychology, Athens, Greece dgeorgas@dp.uoa.gr , http://www.erasmus.gr/dynamic/conventions.asp?conv_id=21r/dynamic/conventions.asp?conv_id=21

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

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

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

Comments or questions regarding this newsletter?
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or via e-mail at bill.ctr.berger @faa.gov

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