



AAR-100

Human Factors Newsletter # 04-23

November 13, 2004 – November 26, 2004

Technical Note: *Design of Information Display Systems for Air Traffic Control.* Tanya Yuditsky, Ph.D., ATO-P; Ferne Friedman-Berg, Ph.D., Titan Systems Corporation; and Alfred Smith, Ph.D., ATO-P.

Executive Summary. A computer-based Information Display System (IDS) provides access to various types of information needed to perform a job. A well-designed IDS can provide many benefits. It can be used to consolidate information into one source, and it can reduce the amount of time it takes for the user to find information by providing a more logical structure and a standardized format. The FAA currently uses different types of IDSs in its ATC facilities. All of these systems use varied design styles, user interaction styles, and customization capabilities. ATC Specialists experienced different levels of success in using existing IDS to access task relevant information. This document describes design standards and guidelines for ATC IDSs. It also describes the lessons learned from the successes and problems of existing systems to provide a context for standards. The application of these design standards and guidelines will address the issues of proliferation of nonstandard systems in the National Airspace System (NAS), while providing the user with an IDS optimized to support his/her information needs. Furthermore, this document will serve to consolidate information on the specialized needs of ATC personnel for system designers, developers, and others involved in the selection or evaluation of an IDS for ATC.

Researchers developed the design standards by studying current IDS use in the field and evaluating existing design guidelines and standards. They did this to identify principles that are particularly important in the design of ATC IDSs. Structured interviews were conducted with 112 ATC Specialists to identify the benefits and problems they experience with IDSs in the field today. Workshops were held with ATC Specialists from the field to review and validate findings. Based on the results, key design components were identified and used as the basis for the standards. For each standard, specific design guidelines are listed and can be used to implement the standard. Researchers also recommend activities that can guide the development of an effective design, or help evaluate the implementation of the standards.

This research supports the Administrator's Flight Plan Goal for Safety, Objective Seven: Enhance the safety of FAA's air traffic systems. It also supports the Administrator's Flight Plan Goal for Greater Capacity, Objective One: Increase capacity to meet projected demand.

Point of Contact: Tanya Yuditsky, WJHTC

Technical Note: *Collocation of User Request Evaluation Tool, Traffic Management Advisor, and Controller Pilot Data Link Communications: An Initial Human Factors Evaluation.*

Pamela Della Rocco, Ph.D., ATO-P; Gulshan Panjwani, Ferne Friedman-Berg, and Parimal Kopardekar, Ph.D., Titan Systems; and Sehchang Hah, Ph.D., ATO-P

Executive Summary. This study was a human factors evaluation of collocating User Request Evaluation Tool (URET), Core Capability Limited Deployment, Traffic Management Advisor, and Controller Pilot Data Link Communications (CPDLC), formerly Build 1A. Human factors specialists conducted the evaluation in two phases: a "paper and pencil" study - Phase 1 and a modified cognitive walkthrough - Phase 2. They examined the tools from existing documentation and system design in the context of human factors best practices. Four primary human factors issues emerged from this analysis: (1) Computer-Human Interface (CHI) inconsistencies; (2) Radar Associate (RA)-side collocation and timely access to information; (3) Communication of information between the RA-side and Radar-side controllers; and (4) National Airspace System updates from the different tools. Results include recommendations for human factors engineering for integrating the URET, CPDLC, and Computer Readout Display information on the RA-side, as well as working toward improving CHI consistencies.

This research supports the Administrator's Flight Plan Goal for Safety, Objective Seven: Enhance the safety of FAA's air traffic systems. It also supports the Administrator's Flight Plan Goal for Greater Capacity, Objective One: Increase capacity to meet projected demand.

Point of Contact: Pam Della Rocco, WJHTC

Tower Flight Strip Study: Carol Manning and Andy Dattel, along with a group of air traffic control subject matter experts and Dino Piccione from ATO-P will be traveling to Toronto, Canada November 30 - December 4 to observe controllers use the Extended Computer Display System electronic flight strip system at the Toronto Tower. They will also review data from the tower flight strip observation study. The purpose of this study is to obtain baseline information about how controllers currently use flight strips in the tower environment. One step toward increasing ATC traffic handling capacity is to eliminate the use of paper flight strips and substitute less laborious but useful ways to manage flight plans and flight progress. Before developing a new technology that replaces paper flight strips with an electronic form of flight data, it is first necessary to understand how, why, and when controllers use paper strips today. This research supports the Administrator's Flight Plan Goal for Safety, Objective Seven: Enhance the safety of FAA's air traffic systems. It also supports the Administrator's Flight Plan Goal for Greater Capacity, Objective One: Increase capacity to meet projected demand. (C. Manning, CAMI)

En Route ATC: Future en route workstation project technical interaction and iteration continues at the William J. Hughes Technical Center. The purpose of this activity is development of the test bed where researchers will have the capability to evaluate proposed functionality which may help controllers handle the anticipated task load for the year 2015. A simulation test of the functionality will be conducted in the spring, 2005. This research supports the Administrator's Flight Plan Goal for Safety, Objective Seven: Enhance the safety of FAA's air traffic systems (P. DellaRocco, WJHTC)

RNAV: William J. Hughes Technical Center researchers continue to plan for a field simulation study to be conducted at the Southern California Terminal Radar Control. The focus will be an examination of alternative Required Navigation approaches for San Francisco approach control that provide increased safety. The simulation will be conducted during the first week of December 2004. This research supports the Administrator's Flight Plan Goal for Safety, Objective Seven: Enhance the safety of FAA's air traffic systems (P. DellaRocco, WJHTC)

ASRS Weather Questionnaire: Dr. William Knecht (CAMI) traveled to NASA Ames Research Center, Moffett Field, CA to meet with staff of the Aviation Safety Reporting System (ASRS). System Safety (ASY-300) is sponsoring beta-testing of a weather incident questionnaire for ASRS. Mike Lenz wrote the questionnaire, and Bob Anoll is coordinating a multi-divisional effort to explore automated, web-based data collection, using this questionnaire as a prototype. This project supports the Administrator's Flight Plan Goal for Safety, Objective Two: Reduce the number of fatal accidents in general aviation. (W. Knecht, CAMI)

Traffic Management Advisor (TMA): William J. Hughes Technical Center personnel at the Research and Development Human Factors Laboratory completed data collection on the TMA simulation study. This was in rapid response to program office requests for real data documenting the impact of the method of displaying delay times within data blocks and/or with a tabular list of the way the system was originally designed. Personnel will analyze the data and provide a detailed briefing of results. This research supports the Administrator's Flight Plan Goal for Safety, Objective Seven: Enhance the safety of FAA's air traffic systems (M. McAnulty, WJHTC)

Publications: In an ongoing effort to make information available, William J. Hughes Technical Center personnel have updated their CD ROM with all technical publications since 1983. This disk will be sent upon request to anyone who would like to have it. The material is also available for download in PDF format from <http://hf.tc.faa.gov>. The Web site has a search engine providing easier access to the information. (V. Ahlstrom, WJHTC)

Position Announcement: Management/Program Analyst in Washington, DC. This announcement is open until December 9, 2004.

Duties: The incumbent functions as a budget analyst, contract administrator, and expert professional acquisition consultant for all business activities supporting the Program Director, e Human Factors Research and Engineering Office and other offices in the Research and

Development Directorate. This person applies a broad knowledge of acquisition and financial management in managing all aspects of office business activities. The incumbent applies acquisition management experience to all aspects of business management including technical and administrative support contracts, technical services contracts, and university grants. This person participates in developing statements of work and Independent Government Cost Estimates and addresses other acquisition requirements. The incumbent also monitors contract performance as the Contracting Officer Technical Representative in providing timely and accurate information for research program managers. For more information, point to: <http://www.faa.gov/> , click on "jobs".

Biometrics: A Biometric Bulletin is being published on-line. It is not clear how you can sign up to receive your own future copies of the Bulletin. Please note at the bottom there is a "Contact" link. This will take you to a page on the web site and a place to send questions/comments. That might be the place to start. (T. McCloy, ATOP-R&D; T. Alley, MATRIS Office, DTIC)

Director's Message



Welcome to the first edition of the DoD Biometric Bulletin. As part of its public outreach mission, DoD Biometrics is pleased to publish this bimonthly newsletter to help educate the national security community and the general public about biometric technologies and how they are being used by the Department.

Each edition of the DoD Biometric Bulletin will focus on a particular theme. The stories in this edition report on the Department's biometric standards development. The January 2005 newsletter will feature the work of the Biometrics Fusion Center.

This web-based publication also includes an Update section, with news of interest, and a Technology Spotlight, which highlights a DoD organization employing the latest biometric technology. I hope you find the Biometric Bulletin interesting and informative. Comments are always welcome. Thank you for your interest in DoD Biometrics.

John D. Woodward Jr.
Director, Department of Defense
Biometrics Management Office

Articles



Workshop Establishes "Standards" Direction to Support War on Terrorism

In the context of the War on Terrorism, it is increasingly important for U.S. Government agencies to have the capability to leverage biometric technology to link individuals to their previous names, aliases and prior activities . . .

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International Standards Body SC37 Meet in Korea

Members of the DoD Biometric Standards Working Group participated in the SC37 meetings June 7 - 15 in Seoul, Korea to discuss international biometric standards development . . .

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National Standards Bodies Examines New ANSI Standards

In addition to recently approved ANSI standards, the Border Management Application Profile Standard was approved Oct. 5 . . .

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Standards Working Group: DoD's Charter and Mission

"The DoD Biometric Standards Working Group is positioning itself as the focal point for the coordination of standards development and implementation activities across the DoD," said Dr. Ramy Guirguis, Chair of the DoD Biometric Standards Working Group . . .

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Updates

[ABIS Database Contract Goes to Lockheed Martin](#)



[2004 Biometric Consortium Conference. Read Presentations from Key Personnel](#)



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

Mark D. Rodgers
FAA (ATOP-R&D)



December 1-2, 2004 – Future of Air Transport, le Meridian Piccadilly, London, England
<http://www.marketforce.uk.com/airtransport2004>

December 9-10, 2004 – Annual EUROCONTROL Experimental Centre Innovative Research Workshop, Brétigny-sur-Orge, France <http://www.eurocontrol.fr/>

January 9-12, 2005 – International Conference on Intelligent User Interfaces, San Diego, CA
<http://www.catamaranresort.com/>

January 9-13, 2005 – TRB 84th Annual Meeting, Washington, DC <http://trb.org/calendar/>

January 10-13, 2005 - 43rd AIAA Aerospace Sciences Meeting and Exhibit, Reno Hilton, Reno, NV <http://www.aiaa.org/>

January 19-21, 2005 – Air Cargo Symposium, Ritz-Carlton New Orleans, New Orleans, LA
<http://www.aci-na.org>

January 25-27, 2005 – AE-2 Aerospace Lighting Committee Meeting, New Orleans, LA
elizd@sae.org

January 28, 2005 – Deadline for papers - 6th USA/Europe ATM Seminar, Baltimore, MD, June 2005 <http://atmseminar.eurocontrol.fr/>

February 1-3, 2005 - ATC Maastricht (EUROCONTROL), Maastricht, Netherlands
<http://www.atcmaastricht.com/>

February 9-11, 2005 – 6th Annual Aviation Security Summit Expo, US Grant Hotel, San Diego, CA <http://www.worldrg.com/AW500/wrg.asp>

February 16-17, 2005 – World Aerospace Symposium, Pierre Baudis Toulouse Congress Center, Toulouse, France http://www.aviationweek.com/conferences/meu_e3.htm

March 6-8, 2005 – Air Cargo 2005, Hotel del Coronado, San Diego, CA
<http://www.aircargokonference.com>

March 17-18, 2005 – Aviation and Environment Summit, Crowne Plaza, Geneva, Switzerland
<http://www.iata.org>

April 2-7, 2005 – CHI 2005, Portland, OR chi2005-chair@acm.org.

April 5-7, 2005 – Aviation Testing Expo 2005: Scientific Conference and Technology Forum, Europe, Messe Hamburg, Germany <http://www.aerospacetesting-expo.com/northamerica/conf+forum.html>

April 11-15, 2005 – SAE 100th Anniversary World Congress, Cobo Hall, Detroit, MI <http://www.sae.org/congress/about/news/congressdates.htm>

April 12-18, 2005 – Sun ‘n Fun 2005, Lakeland, FL <http://www.sun-n-fun.org/>

April 17-22, 2005 – International Federation of Air Traffic Controller’s Associations, Melbourne, Australia http://www.ifatca.org/conferences/annual_conference.htm

April 18-21, 2005 – 13th International Symposium on Aviation Psychology (ISAP), Civil Aerospace Medical Institute (CAMI), Oklahoma City, OK <http://www.cami.jccbi.gov/>, <http://www.wright.edu/isap/>

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

July 22-28, 2005 – HCI International 2005, 11th International Conference on Human-Computer Interaction, Caesars Palace, Las Vegas, NV hci2005@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>

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

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

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>

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/>

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
or via e-mail at bill.ctr.berger@faa.gov

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