



AAR-100

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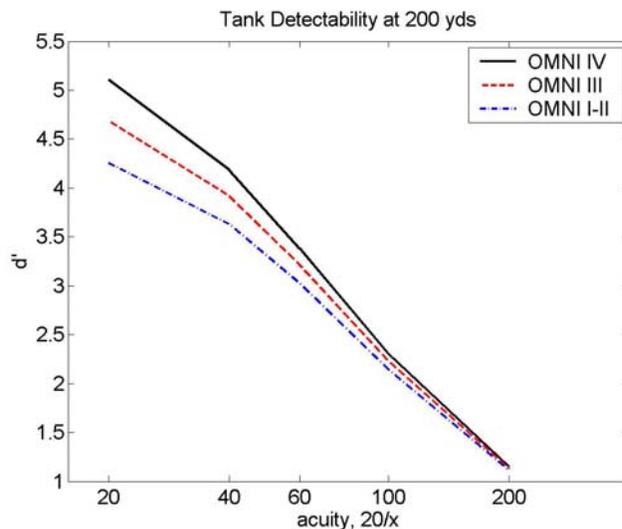
January 10, 2004 – January 23, 2004

Discrimination Model To Predict Night Vision Goggle Target Detection:

RTCA 196 Minimum Operational Performance Standards document outlined numerous issues that the Federal Aviation Administration must consider if civilian pilots are authorized to use Night Vision Goggles (NVGs). A high priority issue identified by the RTCA 196 committee was NVG resolution – what are the effects of degraded visual acuity on NVG detectability (“Minimum visual acuity (VA) requirements” and “Pilot vision requirements for NVG operations” from Simpson, Turpin, and Gardner, 2001, report entitled “Human Factors Issues for Civil Aviation use of Night Vision Goggles”)?

The researcher developed a human performance [Image Discrimination Model](#) (Ahumada, 1996; Ahumada & Beard, 1996, 1997; Rohaly, Ahumada & Watson, 1997) to predict an observer's ability to discriminate between two images – image with a designated target, and identical image with target subtracted. The model includes both the human observer and night vision goggle sensor performance characteristics to predict observers’ ability to detect a target. The model written in Matlab can be [downloaded](#) to allow users to manipulate the model by importing two scenes to predict observers’ detectability.

To predict the effects of degraded visual acuity while using various NVGs, the image discrimination model was modified to include observer’s acuity. The Matlab [acuity program](#) predicts an observers’ detectability of a target with different levels of visual acuity for the three different night vision goggle tubes. The figure below illustrates an observer’s detectability of a tank positioned 200 yards from the observer positioned 200 yards from an observer



no tank



tank

possessing different levels of visual acuity while viewing through three different night vision goggle tubes. The larger the d' value indicates the observer is more sensitivity in detecting the tank.

To predict observers' ability to detect other objects, load image files into the Matlab Image discrimination Model or the acuity software applications. If you have any further questions regarding the software code, please contact Drs. [Ahumada](#) (NASA Ames) or [Landy](#) (New York University). Additional information about this project can be found at <http://www.hf.faa.gov/vffunded.htm>. (W. Krebs, AAR-100).

Awards: Earlier this month, Glen Hewitt, Dino Piccione, and Kip Krebs received ARA "On-The-Spot" awards during a headquarters management team meeting.

- Glen Hewitt and Dino Piccione were recognized for their outstanding efforts in developing the FAA Human Factors Knowledge Portal and successfully making this information resource available on the AAR-100 internet web site. Their efforts have been instrumental to defining the scope of human factors information included in the web site, designing and assessing the capabilities comprising the user interface, and facilitating the dissemination of information about the knowledge portal within the FAA and to the broader human factors community.

The Knowledge Portal is truly unique in that it supports both the integration of human factors in acquisition engineering and human factors research by providing access on key resources in four component areas: Human Factors Process, Tools, Technical Literature, and Human Factors Training. The Knowledge Portal provides important information addressing human factors goals in FAA systems, and how to build a Human Factors Plan. Over 90 human factors tools have been assembled to support program planning, analysis, design, and evaluation activities. The Knowledge Portal provides access to human factors technical reports published by CAMI, the WJHTC, other government research offices, contractors, and universities. The Human Factors Awareness Web Course provides training using ten different modules such as addressing visual displays, human cognition, and team performance. The Knowledge Portal supports the IPTs, human factors practitioners, and researchers, giving them a common suite of key information, tools, and awareness training that facilitates successful integration and execution of human factors in acquisition programs.

- Kip Krebs was recognized for his outstanding efforts in developing the Human Factors Research Projects Database and successfully making this information available on the AAR-100 internet web site. His efforts have been critical to engaging other federal agencies to participate and provide information on their human factors research projects, developing and testing the software application, and disseminating information on the availability of this tool on the internet.

This unique database provides important information for program managers and researchers on human factors projects funded by numerous federal agencies. In addition to the FAA, agencies participating in the database include the Office of Naval Research, Air Force Office of Scientific Research, Army Research Laboratory Human Engineering and Research Directorate, National Aeronautics and Space Administration, Army Research Institute, National Science Foundation, and National Institutes of Health. This database represents a large percentage of human factors research funded by the federal government, and provides capabilities to sort and search projects by funding agency, principle investigator, performing research

organization, and state. The database provides key information on current projects so that agencies, managers, and researchers can leverage similar research priorities and resources and consequently attain increased organizational efficiency.

NASA/FAA Operating Documents Workshop VI: The NASA/FAA Operating Documents Working Group was formed in 1997 with the support of FAA AFS-230 and technical oversight of Dr. Eleana Edens, FAA Air Transportation Human Factors Program Manager. Since its inception, the group has identified and discussed key issues in developing operating documents, structuring and managing information systems, and transitioning to electronic media. Participants have helped develop guidelines and standards, and presented lessons learned through industry workshops and activities such as the Operating Testing Group (OTG) described below.

On November 4-5, 2003, the NASA/FAA Operating Documents Workshop VI - *Updating Your Data: The Future of Revisions* was held in Orlando, Florida. The 64 participants included representatives from airlines, cargo operators, aircraft manufacturers, industry organizations, vendors and government agencies. The meeting focused on the development of a Common Data Structure for the exchange of data between suppliers and operators, and the reuse of digital data within flight operations. Presentations and product demonstrations covered such topics as: the operational uses of digital data, the need for an industry information standard, the technical requirements for a common data structure, revision of the electronic flight bag, and strategies for implementing a digital data system.

In addition, the workshop was closely tied to the activities of the ATA Flight Operating Working Group by reviewing a simplified, preliminary version of the Common Data Structure currently under development by the Manufacturers' Information Team. An interactive explanation of the Common Data Structure was presented by the Operational Testing Group (OTG), a sub-team of the NASA/FAA Operating Documents Group. The OTG developed an Electronic Revision Prototype (ERP) for the operational testing of the Common Data Structure, providing an overview of the new data structure along with details of the information units that will allow more efficient revisions and better reuse. Each workshop participant was given a copy of the ERP on a CD-ROM to help them preview and assess the preliminary version of the Common Data Structure. Their feedback on how the Common Data Structure could affect their current revision processes will be provided to the ATA and aviation industry. (B. Kanki, NASA-Ames; E. Edens, AFS-230)

NASA News: NASA Administrator, Sean O'Keefe, announced that Dr. J. Victor Lebacqz is the Associate Administrator for Aeronautics effective January 15, 2004. The space technology programs were removed from the previous Aerospace Technology Office to become a separate office and forming the Office of Aeronautics (Code R), which contains all NASA aeronautics and aviation research.

EAS: Dr. Carla Hackworth provided a pre-brief of the 2003 Employee Attitude Survey (EAS) results to AHR personnel on January 6th. A briefing to the Administrator, Deputy Administrator, and other personnel occurred on January 9th at FAA Headquarters. A comparison of the 2003 results with those from 2000 provides senior FAA management with information concerning the effectiveness of interventions designed to enhance organizational effectiveness within the FAA.

Plans were initiated for a separate briefing for the Administrator's Management Team. (D. Schroeder, CAMI)

Public Affairs: Holly Baker, Public Affairs Officer at the William J. Hughes Technical Center, escorted Wall Street Journal staff reporter Paula Szuchman through the Human Factors Laboratory. Ms. Szuchman is considering development of an article related to FAA human factors research. (E. Stein, WJHTC)

ADS-B: Kenneth Allendoerfer and Mike McAnulty from ACB-220 participated as human factors advisors during a two-day meeting with the Surveillance Integration Team (SIT). The SIT is currently working to develop user interface requirements for displaying Automatic Dependent Surveillance Broadcast (ADS-B) information on terminal automation systems. This work is focused on an implementation of ADS-B at Louisville International Airport-Standiford Field (SDF) on the Common Automated Radar Terminal System platform. The SIT has completed user interface design "thinspecs" that will serve as guidance to the program office and the system vendor in the creation of formal requirements. The "thinspecs" contain more examples and explanation than traditional requirements documents as a way of documenting the design and the rationale behind it. They are also a mechanism for communicating the design to the Air Traffic Enhancement and Modernization (ATEAM) group that formed the SIT. "Thinspecs" are accompanied by a realistic prototype that demonstrates the design on the simulation platform. They will be implemented by the vendor, and the SIT will participate in further validation and testing of the design at SDF over the next two years. (E.Stein, WJHTC)

General Aviation: CAMI personnel participated (in person and via telecom) in the General Aviation TCRG meeting that was held at FAA Headquarters on January 22nd. The TCRG reviewed the status of current research, identified newly emerged requirements for FY04/05 research, and identified new requirements for FY06. Adjustments in plans were made in accordance with existing research priorities. (D. Schroeder, CAMI)

HFACS: During the week of January 20-23, Drs. Scott Shappell and Bert Boquet (CAMI) participated in several meetings and briefings regarding the Human Factors Analysis and Classification System (HFACS) analysis of general aviation and commercial aviation accidents at FAA Headquarters. This included:

- Ms. Debbie Bruce, Chief of Safety Studies regarding the proposed HFACS analysis of the 2003 fatal general aviation accidents.
- The Aviation Safety Index Workshop (Hosted by AAI-1)
- AFS-830 (Mr. Bill Wallace) and Helicopter Association International (Mr. Richard Wright) regarding HFACS rotocraft analyses.
- NASDAC Team Lead (Mr. Chris Pokerski) to discuss questions regarding hosting of the HFACS database on the NASDAC website.

Point of Contact: S. Shappell, CAMI

Meeting with ASD-103. On January 21st, members of the Human Factors Group (ACB-220) met with Cheryl Souders (ASD-103), the FAA Chief System Engineer for Weather. Topics discussed by Ms. Souders included:

- Evolution of weather products and concerns about the display and dissemination of weather information
- Creation of a weather evolution plan, which would describe how to improve efficiencies necessary to move forward in the modernization of National Airspace System weather information gathering and dissemination
- Concerns related to the integration of information displays and the best way to bring weather information into the system-wide information network as described in the Target System Description (TSD)
- ASD contributions to the TSD (she solicited feedback and suggestions on how to improve the document)

Technical Center engineering research psychologists described work currently being conducted and planned in the area of weather and information display systems. They also described ways to provide a service toward improving information displays and improving the display of weather. Ms. Souders requested and received a copy of a technical note from one of the researchers and said she would send a copy of the complete TSD for comment and feedback. (E. Stein, WJHTC)

DoD Briefing: On January 22nd, personnel from the NAS Human Factors Group (ACB-220) and the R&D Labs Group (ACB-840) presented a briefing on the Technical Center's Human Factors program and conducted demonstrations of virtual reality, prototyping, and human-in-the-loop simulation capabilities to representatives of the US Transportation Command located at Scott AFB, Illinois. The visitors asked numerous questions about research methodologies, especially in regard to activities related to system development and acquisition. At a subsequent meeting, they expressed an interest in other FAA capabilities, including support for their worldwide system development program. (E. Stein, WJHTC)

*More information on human factors research can be found at
the FAA Human Factors (AAR-100) web site: <http://www.hf.faa.gov>*

Mark D. Rodgers
FAA (AAR-100)



February 9, 2004 – Call for proposals (workshops, lecture papers, symposia, panels, debates, special-format sessions, and posters), Human Factors and Ergonomics Society 48th Annual

Meeting to be held September 20-24, 2004, New Orleans, LA
<http://www.hfes.org/meetings/2004menu.html>

March 2-3, 2004 – REDAC Human Factors Subcommittee, Washington, DC
<http://research.faa.gov/aar/redac.asp>

March 3-4, 2004 – 5th European Technology Summit, Amsterdam Marriott Hotel, The Netherlands
<http://www.eyefortransport.com/technology/brochure.shtml>

March 4-5, 2004 - Divisions 19 and 21, in conjunction with the Potomac Chapter of the Human Factors and Ergonomics Society, will be hosting the Annual Mid-year Symposium March 4th and 5th, 2004 at the Fort Belvoir Officer's Club, Fort Belvoir, Virginia. jruffner@dcscorp.com

March 4-5, 2004 - American Psychological Association Divisions 19 and 21 [Midyear Symposium](#), Fort Belvoir, VA <http://hfetag.dtic.mil/docs/APA-2004-Midyear-Symposium.pdf>

March 8-11, 2004 – SAE World Congress, Cobo Hall, Detroit, MI
<http://www.sae.org/congress/index.htm>

March 15-17, 2004 – 16th Annual European Aviation Safety Seminar, Barcelona, Spain
http://www.flightsafety.org/eass04_cfp.html

March 22-24, 2004 – Eye Tracking Research and Applications Symposium, Menger Hotel, San Antonio, TX <http://www.e-t-r-a.org/>

March 22-25, 2004 – HPSAA II Conference, Human Performance, Situation Awareness, and Automation Technology, hosted by Embry-Riddle Aeronautical University and the University of Central Florida, Hilton Oceanfront Resort, Daytona Beach, FL
<http://faculty.erau.edu/vincenzd/hpsaa>

March 23-26, 2004 – 4th International Workshop on Smart Appliances and Wearable Computers, Tokyo, Japan <http://www.unl.im.dendai.ac.jp/IWSAWC/>

April 2004 – DOD TAG-51, Atlantic City, NJ <http://hfetag.dtic.mil/meetschl.html>

April, 2004 – SAE General Aviation Technology Conference and Exhibition, Century II Convention Center, Wichita, KS <http://www.sae.org/calendar/aeromtgs.htm>

April 18-21, 2004 – FAA Worldwide Airport Technology Transfer Conference, Hilton Atlantic City Hotel, Atlantic City, NJ <http://www.airtech.tc.faa.gov/att04/>

April 20-22, 2004 – SAE General Aviation Technology Conference and Exhibition, Century 21 Convention Center, Wichita, KS <http://www.sae.org/calendar/aeromtgs.htm>

April 24-29, 2004 – CHI 2004, Conference on Human Factors in Computing Systems, Vienna, Austria <http://www.acm.org/sigchi/chi2004/>

April 25-28, 2004 – SAE Cabin Safety Technical Committee Meeting, Oklahoma City, OK
mlemank@sae.org

April 27-29, 2004 – 49th Annual Corporate Aviation Safety Seminar, Tucson, AZ
http://www.flightsafety.org/cass04_cfp.html

May 3-6, 2004 – SAE Aircraft Oxygen Equipment Committee, Anchorage, AK
mlemank@sae.org

May 3-6, 2004 – 75th Annual Scientific Meeting of the Aerospace Medical Association, Egan Convention Center, Anchorage, AK <http://www.asma.org/>

May 6-8, 2004 - AHS International 60th Annual Forum and Technology Display, Virginia Beach, VA. Contact Staff@vtol.org

May 10-12, 2004 – Royal Aeronautical Society 10th AIAA CEAS Aeroacoustics Conference, Manchester Town Hall, UK <http://www.aerosociety.com/homepage.asp>

May 11-13, 2004 – SAE SEAT – Aircraft Seat Committee, Savannah, GA
mlemank@sae.org

May 23-26, 2004 – Tenth International Conference on Mobility and Transport for Elderly and Disabled People, Hamamatsu, Japan <http://trb.org/calendar/>

May 25, 2004 - Human Factors Integration Symposium, MoD, Abbey Wood, Bristol, UK
<http://hfetag.dtic.mil/docs/HFI-Symposium-Flyer.doc>

May 26-27, 2004 – Royal Aeronautical Society Conference – Flight Simulation 1929-2029, A Centennial Perspective, London, UK <http://www.aerosociety.com/homepage.asp>

June 15-17, 2004 – SAE Digital Human Modeling for Design and Engineering Meeting, Oakland University, Rochester, Michigan <http://www.sae.org/calendar/aeromtg.htm>

July 8, 2004 - Human Factors Tool Symposium, Orlando, Florida
<http://hfetag.dtic.mil/docs/NASA-Tools-Workshop.doc>

July 27-August 2, 2004 – 52nd Annual AirVenture, Oshkosh, WI <http://airventure.org/>

July 28 – August 1, 2004 – 112th Convention of the American Psychological Association. Honolulu, Hawaii <http://www.apa.org/convention>

August 1-4, 2004 – Designing Interactive Systems, Cambridge, MA
<http://www.sigchi.org/DIS2004/>

September 8-9, 2004 – Civil Aviation Safety Symposium 2004, Westin Hotel Galleria, Dallas, TX <http://www.asdnet.org/cass/default.htm>

September 20-24, 2004 – Human Factors and Ergonomics Society 48th Annual Meeting, Sheraton New Orleans Hotel, New Orleans, LA <http://www.hfes.org/>

September 29 – October 1, 2004 – 2004 International Conference on Human Computer Interaction (HCI-Aero), Toulouse, France
<http://www.eurisco-international.com/hci-aero2004>.

October, 2004 – 18th Airbus/JetBlue Human Factors Symposium, New York City, NY
<http://www.airbus.com/customer/events.asp>

October 4-7, 2004 – SAE SEAT – Aircraft Seat Committee Meeting, Albuquerque, NM
mlemank@sae.org

October 18-19, 2004 – National Academies Institute of Medicine Annual Meeting, National Academy of Sciences, Washington, DC <http://wwwsearch.nationalacademies.org/>

October 23-27, 2004 – NordiCHI 2004, Tampere, Finland <http://www.cs.uta.fi/nordichi2004/>

October 25-28, 2004 – SAE S-9 Cabin Safety Technical Committee Meeting, San Diego, CA
mlemank@sae.org

October 25-28, 2004 – DoD Maintenance Seminar and Exhibition, Hilton Americas, Houston, TX <http://www.sae.org/calendar/aeromtgs.htm>

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

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

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

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

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