Final Report for NASA-Ames Research Center
Cooperative Agreement Aerospace Human Factors (NCC 2-327)
with the Psychology Department, San Jose State University

Kevin Jordan, Professor and Project Director
Department of Psychology
San Jose State University
San Jose, CA 95192

November 1, 1984 to January 31, 1999

The Technical Monitor for the Cooperative Agreement is Dr. R. Key Dismukes, Senior Staff Scientist, Flight Management and Human Factors Division, NASA-Ames Research Center, Moffett Field, CA 94035
Aerospace Human Factors

The following contains the final report on the activities related to the Cooperative Agreement between the human factors research group at NASA Ames Research Center and the Psychology Department at San Jose State University (NCC 2-327). The participating NASA Ames division has been, as the organization has changed, the Aerospace Human Factors Research Division (ASHFRD and Code FL), the Flight Management and Human Factors Research Division (Code AF), and the Human Factors Research and Technology Division (Code IH). The inclusive dates for the report are November 1, 1984 to January 31, 1999. Dr. Jordan, currently a Professor of Psychology at San Jose State University and the Project Director, initiated the agreement in 1984 with Dr. Walter T. Plant. Dr. Plant retired from all grant activities on June 1, 1985. Dr. Jordan was Project Director from that date forward. The Technical Monitors for the cooperative agreement have been Drs. David Nagel (1984-1987), Michael Shafto (1987-1993), and R. Key Dismukes (1993-1999).

Throughout the years, approximately 170 persons worked on the cooperative agreements in one capacity or another. The Cooperative Agreement provided for research personnel to collaborate with senior scientists in ongoing NASA ARC research. As the list details, 72 of these research personnel received the MA or MS degree at San Jose State University. There were some upper-division undergraduates who participated in the agreement. Finally, many post-MA/MS and post-doctoral personnel contributed to the projects. It is worth noting that 10 former cooperative agreement personnel were hired into civil service positions directly from the agreements. The following is a list of the Cooperative Agreement personnel during the period covered by this report:

Project Director

Kevin Jordan (Ph.D., Kansas State University)
Walter T. Plant (Ph.D., Stanford University; retired June 1, 1985)

Research Advisers

Robert Cooper (Ph.D., University of Minnesota)
Rose Ginsberg (Ph.D., University of Indiana)
Laree Huntsman (Ph.D., University of Wisconsin)

Project Personnel

Jonathan Abel (Ph.D.)
Dorothea Acomb (MA, SJSU)
Will Aiken (MA, UC-Santa Cruz)
Ramon Alarcon (MS, Stanford)
Inna Aleksandrovsky (Ph.D. candidate, UC-Berkeley)
Anthony Andre (Ph.D., U of Illinois)
Lola Arnold (MA, SJSU)
Mikel Atkins (MS, Embry-Riddle)
Sue Atkinson (MA, SJSU)
Cindy Awe (MA, SJSU)
Eric Barrett (BS candidate, Stanford)
Kristin Bauersfeld (MA, SJSU)
Bettina Beard (Ph.D.)
Durand Begault (Ph.D., UC-San Diego)
Sean Belcher (MA, SJSU)
Lori Bernstein (Ph.D.)
Brent Beutter (Ph.D., UC-Berkeley)
Alison Bianchi (MA, SJSU; Ph.D. candidate, Stanford)
Sheila (Holland) Bochow (MA, SJSU)
Philippa (Gander) Boy (Ph.D.,
Connie (Williams) Brasil (MA, SJSU)
Paula Bray (BA, SJSU)
Francois Breant (Ph.D.)
William Briggs (BS, SJSU)
Mark Burdick (MA, U of Illinois, Chicago)
Jack Calderone (MA, SJSU)
Antonio Carvalhais (Ph.D., U of Connecticut)
Patricia Cashion (MA, SJSU)
Kelvin Chan (MS, SJSU)
William Chan (MA, SJSU)
Rebecca Chute (MA, SJSU)
Lynn Cole (MS, SJSU)
Kim Coleman
Heidi Colenso (MA candidate, SJSU)
Linda Connell (MA, SJSU)
Jocelle Cowan
Barry Crane (MA, SJSU)
Donna Davilla (MA, SJSU)
Deborah Davis (MA, SJSU)
Jeannie Davison (MA, SJSU)
Asaf Degani (Ph.D., Georgia Tech)
Susanne Delzell (MA, SJSU)
Adeh DeSandies (BA, Stanford)
Melisa Dunbar (MA, SJSU)
Miquel Eckstein (Ph.D.)
Robert Edmiston (MA, SJSU)
Sheryl Ehrlich (Ph.D. candidate, UC-Berkeley)
Peter English (MA, SJSU)
Georgianna Evan (MS candidate, SJSU)
Ute Fischer (Ph.D.)
Tim Floyd (MA, SJSU)
Michael Freed (Ph.D., Northwestern U)
Kathy Fugitt (MA, SJSU)
Allen Gale (BS, SJSU)
Miri Gold (MS)
Allen Goodman (MA, SJSU)
David Graeber (MS, SJSU; Ph.D. candidate, U of Central Florida)
Kristin Greenwood
Steven Gregorich (Ph.D., U of Texas)
Keri Haars (MA, SJSU; Ph.D. candidate, U of Missouri, Kansas City)
Elizabeth Hackett (MA, SJSU)
Paul Hatalsky
Andy Hayes (BA, SJSU)
Michael Hazelrig (BS candidate, U of Virginia)
Darren Heinrichsen
Wallace Henry (MS, CSU-Hayward)
Stephanie Hinz (MA, SJSU)
Tim Hogan (MA, SJSU)
Laree Huntsman (MA, SJSU; Ph.D., U of Wisconsin-Milwaukee)
Scott Iyama
Kimberly Jobe (MA, SJSU)
Robert Johnstone (MA, SJSU; Ph.D., U of Oregon)
Karen Jones (MS candidate, SJSU)
Teresa King (MS, SJSU)
Alex Kirlik (Ph.D.)
Abby Lack
Kevin Lai
Fidel Lam (BA, SJSU; MA candidate, SJSU – deceased)
Brian Lathrop (BA, SJSU; Ph.D. candidate, UC-Santa Cruz)
Irene Laudeman (BA, SJSU; Ph.D., UC-Berkeley)
Jason Lawrence (MA, SJSU)
Katharine Lee (MA, SJSU)
Alexandra Lee (MA candidate, SJSU)
Jonathan Levy (Ph.D., UC-San Diego)
Shawn Lewis (BS candidate, SJSU)
Lyn Linville (MA, SJSU)
Christopher Livingston
Elizabeth Logsdon (MA, SJSU)
Sandy Lozito (MA, SJSU)
Jean Lynch (MA, SJSU)
Margaret Mackintosh (MA, SJSU)
St. John Maloney (MA, SJSU)
David Marcarian (MA, SJSU)
Michael McBeath (Ph.D., Stanford)
Jeffrey McCandless (Ph.D., UC-Berkeley)
Robert McCann (Ph.D., U of Waterloo)
Lori McDonnell (MA, SJSU)
Alison McGann (MS, Stanford)
Elizabeth McKean
REFERENCES TO WORK PUBLISHED OR PRESENTED BY COOPERATIVE AGREEMENT PERSONNEL


Begault, D R (in press) Perceptual effects of synthetic reverberation on 3-D audio systems. Journal of the Audio Engineering Society


Brickner, M.S., & Staveland, L.E. (April, 1989). Comparison of thermal (FLIR) and television images. Proceedings of the Fifth International Symposium on Aviation Psychology, Columbus, OH.


Connell, L. J. (1988). Circadian rhythms research: Applications to medical environments. Department of Neonatology, School of Medicine, Stanford University.


Davilla, D M (1992) The transfer of multimodal vs unimodal prototypes Masters thesis, San Jose State University


Gander, P. H., & MacDonald, J. A. Adaption of sleep and circadian rhythms to the Antarctic summer: A question of zeitgeber strength? Submitted to Aviation, Space, and Environmental Medicine.


Gander, P.H., Myhre,G., Graeber, R.C., Andersen, H.T., & Lauber, J.K. (1989). Adjustment of sleep and the circadian temperature rhythm after flights across nine time zones, Aviation, Space, and Environmental Medicine, 60 (8), 733-743.


Graeber, R. C., Connell L. J., Lauber, J. K., & Gander, P H. Sleep and wakefulness in international aircrews. Aviation, Space, and Environmental Medicine (in press)


Gregorich, S. E. (August, 1992) CRM Training Assessment Presentation to the 2nd Annual CRM Industry Workshop, St Paul, MN


Kanki, B. G & Gregorich, S E (1992) Team dynamics in isolated and confined environments: Saturation divers and high-altitude climbers Proceedings of the MAA Space Programs and Technologies Conference Huntsville, AL: American Institute of Aeronautics and Astronautics


King, T. The effect of resource demands on a three axis tracking task in a dual task paradigm. Masters thesis, San Jose State University.


Laudeman, I V., & Palmer, E A (under review) The effect of cockpit automation on aircrew workload Human Factors


Lozito, S. C., Kanki, B., & Foushee, H. C. (1987), "But captain, I've been doing this a lot longer than you have", the effects of "role reversal" on crew interaction. Paper presented at Fourth International Symposium on Aviation Psychology, Columbus, OH.


McCann, R.S., & Johnson, J.C. (November, 1989). On the locus of processing bottlenecks in the overlapping tasks paradigm. Paper presented to the annual meeting of the Psychonomic Society, Atlanta, GA.


REFERENCES TO WORK PUBLISHED OR PRESENTED BY
THE PROJECT DIRECTOR

PAPERS

Jordan, K. (under review). Word-length effects and misorientation: Serial processing or
attentional shift. *Perception & Psychophysics*.

Lozito, S., McGann, A., Cashion, P., Dunbar, M. G., Mackintosh, M., Dulchinos, V., & Jordan,
K. (in press). Self-separation issues in free-flight: An initial examination of air-ground

knowledge. *International Journal of Aviation Psychology*.

processing misoriented words. To be submitted to *Memory & Cognition*.

learning on recognition of airport runways presented at various orientations. *Aviation,
Space, and Environmental Medicine, 69*, 104-110.

Development and demonstration of a prototype free flight cockpit display of traffic

decision response times at repeated and novel orientations. *Journal of Experimental

Head-up displays: Effect of information location on the processing of superimposed
symbology. *Proceedings of the Seventh International Conference on Aviation
Psychology*. Columbus, OH: Ohio State University.

Psychology, 104*, 460-463.


Psychophysics, 46*, 546-554.

reticle presence on performance in a vertical alignment task. *Aviation, Space, &
Environmental Medicine, 60*, 543-549.

*Perception & Psychophysics, 43*, 446-456.


Tuttell, R.J., McNally, K.L., & Chappell, S.L (April, 1989). Pilot response to avoidance regions depicted on alternate' TCAS II resolution advisory displays. Paper presented at the Fifth Symposium on Aviation Psychology, Columbus, OH.


REFERENCES TO WORK PUBLISHED OR PRESENTED BY
THE PROJECT DIRECTOR

PAPERS

Jordan, K. (under review). Word-length effects and misorientation: Serial processing or
attentional shift. Perception & Psychophysics.

Lozito, S., McGann, A., Cashion, P., Dunbar, M. G., Mackintosh, M, Dulchinos, V. & Jordan,
K. (in press). Self-separation issues in free-flight: An initial examination of air-ground


processing misoriented words. To be submitted to Memory & Cognition.

learning on recognition of airport runways presented at various orientations. Aviation,
Space, and Environmental Medicine, 69, 104-110.

Development and demonstration of a prototype free flight cockpit display of traffic

decision response times at repeated and novel orientations. Journal of Experimental
Psychology: Human Perception & Performance, 21, 963-977.

Head-up displays: Effect of information location on the processing of superimposed
symbology. Proceedings of the Seventh International Conference on Aviation
Psychology. Columbus, OH: Ohio State University.

Psychology, 104, 460-463.


exposure conditions. Perception, 19, 307-316.

Psychophysics, 46, 546-554.

reticle presence on performance in a vertical alignment task. Aviation, Space, &
Environmental Medicine, 60, 543-549.

Perception & Psychophysics, 43, 446-456.


**PRESENTATIONS**


Jordan, K., & Schiano, D.J. (May, 1986). *Simultaneous length contrast depends on relative not absolute spatial separation*. Paper presented at the annual meeting of the Western Psychological Association, Seattle, WA.


