

President's Page

The end of 2004 was a period of increased activity for the Aerospace Medical Association and for many of our members.

Tomaz Koselj, M.D., President of the Slovenian Aerospace Medical Association (SAsMA) and Chief Flight Surgeon of the Slovenian Armed Forces, organized the 3rd Annual SAsMA Meeting entitled "Annual Potocnik & Rusjan Memorial Days" in honor of two scientists who contributed to the development of aviation and space science in Slovenia. Several AsMA members participated as guest speakers in this meeting that was held in Ljubljana, Slovenia.

Marian Sides, Ph.D. (Chair, AsMA Corporate & Sustaining Membership Committee) organized the "First International Congress on Space Flight Issues in the 21st Century" in Bellagio, Italy. The Congress focused on cardiovascular risk aspects of spaceflight. Several AsMA members presented papers on various aspects of cardiovascular risks in long duration spaceflights and discussed possible countermeasures. Other outcomes of this congress include a report/position paper that will be submitted to the AsMA Executive Committee for review and a two-part panel that will be presented at the AsMA scientific meeting in Kansas City.

Luis Amezcua Gonzalez, M.D., former Director of the National Center of Aviation Medicine in Mexico and former Medical Director of Aeromexico Airlines, put together an outstanding scientific program for the XXI International Meeting in Aerospace Medicine of the Mexican Association of Aviation Medicine. The theme for the meeting was "Aerospace Human Factors," and several AsMA members participated as guest speakers.

Chrysoula Kourtidou Papadeli, M.D., Ph.D., Director of the HCAA Aeromedical Center and President of the Greek Aerospace Medical Association, organized the 2nd Seminar in Clinical Aviation Medicine at the West Macedonia Federation Headquarters in Thessaloniki, Greece. The purpose of this seminar was to promote aeromedical safety through the discussion of aviation medical standards, policies, and procedures.

AsMA convened the mid-year Council Meeting, and I am pleased to inform you that it was very productive. We approved unanimously the final AsMA Strategic and Business Plans, which will be published in the February issue of the ASEM journal. These plans have been officially implemented and are currently being used to support/guide all AsMA initiatives. The final design and implementation of the AsMA Mentorship Program has the highest priority. Each AsMA committee was assigned a list of tasks and projects that cover a variety of issues including: Operation of Unmanned Aerial Vehicles, Fatigue Countermeasures in Aviation, Intervals for Flight Medical Examinations, Medical



Melchor J. Antuñano, M.D., M.S.

Standards for Flight Attendants, Optimal Cabin Pressure for Commercial Aircraft, Use of Go-No-Go Pills in Aviation Operations (military and civilian), Bio-Surveillance in Commercial Aviation, Biohazard Decontamination of Commercial Aircraft, Airport Disaster Preparedness, Radiation Exposure in Aviation Operations, Medical Care and Countermeasures for Moon-Mars Missions, International Aerospace Medicine Training Programs and Academic Institutions, International Aerospace Medicine Research Programs and Facilities, Future of Aerospace Medicine, etc.

The Communications Committee reported that the re-designed AsMA website is expected to be operational in the very near future (if not already up and running).

The Education and Training Committee reported that 376 attendees at the AsMA meeting in Anchorage completed Continuing Medical Education (CME) evaluations. The overall rating for the scientific program was 4.45 based on a scale from 1 to 5 (with 5 being the highest rating). In addition, 54% of all respondents rated the program "Excellent", 38% rated it "Very Good", and the remaining 8% rated it "Good." Dr. Dougal Watson submitted a detailed proposal (including cost estimates) to convert all ASEM journal articles into a searchable digital collection. Dr. Rayman reported that his meeting with representatives from the Accreditation Council for Continuing Medical Education (ACCME) in Chicago went very well, and we should expect our AsMA re-accreditation to be approved in the near future. Dr. Richard Jennings, Vice-President for Education and Research, submitted to Council a draft containing proposed guidelines for AsMA's co-sponsorship of educational activities (meetings, conferences, workshops, symposia, short courses, etc.) conducted by external organizations. He also presented a draft proposal to standardize the application process and the selection criteria for the AsMA/AMSRO Scholarship.

The Membership Committee reported that as of November 1, 2004, our association had 3,103 active members (2,321 U.S. and 729 non-U.S.) Since May 1, 2004, we recruited 235 new members, 70 were re-instated, 207 had delinquent annual dues, 11 resigned, and 5 passed away.

The Scientific Program Committee convened a meeting to review all abstracts submitted for presentation in the 76th Annual Scientific Meeting in Kansas City. As usual, we were fortunate to have the support of many AsMA members who were willing to assist in the scientific review process. Out of 431 abstracts that were submitted for consideration, 410 were accepted and 21 rejected or withdrawn. In addition to the panel sessions and posters, the 2005 scientific program will include Sunday workshops on "Fatigue and Countermeasures in Aviation" and "Statistical Analysis for Aerospace Professionals." I take this opportunity to express our great appreciation to Scott Shappell, Ph.D. (Scientific Program Chair), Jeff Myers, M.D. (Deputy Program Chair), Carol Manning, Ph.D. (Past Program Chair), Alex Wolbrink, M.D. (Panels Chair), Roni Prinzo, Ph.D. (Posters Chair), Phil Scarpa, M.D. (Deputy Posters Chair), as well as the group of AsMA members who volunteered their time and efforts to accomplish the required peer review process and to put together a structured scientific program agenda that meets the continuing education needs of our membership.

By the time you read this page you should already know that NASA's X-43A unmanned research vehicle flew at an altitude of 110,000 feet above the Pacific

Ocean and set a flight record by reaching a speed of Mach 9.8 (about 7,000 mph). The X-43A scramjet demonstrator is a 12-foot long, 5-foot wide lifting body mated to a modified Pegasus booster rocket that was air launched from NASA's B52-B at an altitude of 47,000 ft. Following separation, the booster carried the X-43A to 110,000 ft, where it detached and ignited its scramjet engine for approximately 10 seconds. A supersonic combustion **ramjet (scramjet)** engine has no moving parts. The forward speed of the aircraft compresses a stream of air that is directed into the engine where it mixes with fuel at supersonic speed and produces thrust. It is predicted that scramjets will reach speeds of Mach 15 and higher. These engines have the advantage over rockets in that they extract oxygen from the atmosphere instead of having to carry liquid-oxygen tanks onboard the vehicle. This successful X-43A flight was a significant milestone in the development of scramjet technology that has the potential to offer an alternative to rocket propulsion, and that may enable cheaper and safer ultra-high-speed flights in the future. Scramjet vehicles could represent the next evolutionary step in manned commercial aviation transportation. Another exciting aspect of this achievement is that AsMA can play a proactive role regarding the safe introduction of such revolutionary aerospace technology for commercial use. In fact, one of the goals in our Strategic Plan is to "Advocate a human-centered approach to support the development and implementation of new and evolving aerospace technologies."

In closing, I would like to take this opportunity to wish you and yours a happy and healthy New Year.

Medical News

Executive Director's Column



Rayman

AsMA Updates

In this month's column, I thought it would be of interest to provide you with updates on the activities of the Home Office rather than focusing on a single subject. First, the Home Office is now beginning to gear up for our next Annual Scientific Meeting scheduled for Kansas City next May. By the time you read this column, the abstracts of the meeting will have been peer reviewed and the program will be finalized. Activity will start to become frantic in the February, March, and April time frame.

The Executive Committee, after careful analysis, opted to pay off half of our mortgage and to refinance the balance. This was accomplished on very good terms for the Association. We now owe only \$177,000 with a 60-month amortization schedule with a mortgage interest rate of 5.75%. (We were paying 7.99% on the previous mortgage.) Therefore, in September 2009, the Association will have entirely paid for the Home Office building and can have a rousing mortgage burning party.

AsMA convened a meeting in Bellagio, Italy in late October with invitations extended to selected scientists in space medicine. The attendees focused primarily on cardiovascular risk assessment for long duration missions. The product of this meeting will be two panels in Kansas City and a supplement covering the proceedings. This meeting was organized by Col. Marian Sides with sponsorship by our Corporate and Sustaining Member Affiliate Group. We owe a debt of gratitude to Marian and the Corporates that supported this meeting. We will be hearing much over the coming months regarding their deliberations.

Your Home Office has sent several letters to the military services expressing our concerns with the diminishing resources in aerospace medicine research. We hope that we have some influence in reversing this trend.

During the past year, two very important position papers were published in the journal on SSRIs and the aviator and on the Age-60 Rule; both of these papers have had worldwide distribution with great interest by the media as well as by a number of regulatory agencies. It is this type of bold action that puts AsMA out in front.

We are still in the process of updating our web site with beta testing just beginning. The

new site promises to be a great improvement.

Currently, various AsMA committees and ad hoc groups are working on resolutions/position papers on 15 issues of great interest to the aerospace medicine community. They are listed on page 1015 of the November 2004 issue of the journal.

This coming week I will be appearing before an ACCME Committee that will be inspecting us for compliance with their standards on Continuing Medical Education. This will be my third go at these activities since becoming Executive Director, so I am very familiar with the drill. However, the ACCME has been tightening their requirements year by year; consequently, it takes considerable effort to prepare the package they require (99 pages in our case) and to answer the barrage of questions that I will face later on this week. I am confident that we will do well. But even then, like any good IG team, they always find deficiencies. In any event, we will receive their final report in March 2005, so you will hear about the results at the May meeting.

Regarding the MOC program, we instituted it for the first time in Alaska. Although there were some glitches, we will be making adjustments to improve the process for the Kansas City meeting. I was somewhat surprised that only 41 physicians requested MOC credit in Alaska.

Financially, the Association this year has fared reasonably well, although our end of year finance report will tell the story for 2004. Unless something unforeseen happens, I expect that we will be in reasonably good shape.

You're probably weary of hearing me talk about membership, but I feel we can do much better. I would remind everyone that membership is critical to the health of this Organization and that all of us are obligated to participate in this endeavor. Please make every effort to recruit one member during 2005. If you do so, I will be eternally grateful and I also would be able to decrease my dose of valium!

Meeting of the Mexican Association of Aerospace Medicine

The Mexican Association of Aerospace Medicine held its 21st International Reunion October 27-31, 2004, in Acapulco. At the helm was Dr. Luis Amezcua and his son, Dr. Octavio Amezcua, both of whom are to be congratulated for organizing an outstanding Congress. Of course there were many others involved in the planning process who deserve recognition, but the list would be very long. However, I would be remiss if I did not mention Dr. Silvio Finkelstein, whose hand was felt by everyone at the meeting. He not only served as a silent partner in the planning, but also delivered the keynote Magistral Dr. Luis Amezcua Lecture entitled, "Aerospace Medicine in the Context of Operational Security."

The Conference opened with great pomp and circumstance with remarks made by senior government and military officials, including a representative of the Secretary of Communications and Transport. The military band and color guard smartly marched into the hall and gave a rousing rendition of the Mexican National Anthem.

The theme of the meeting was Human Factors in Aviation. Consequently, major presentations in this area were given by Drs. Claus Curdt-Christensen, Melchor J. Antuñano, Edward Brook, and Jose R. Gabrel. Others were also given, each with a national or international perspective. A common theme throughout was that human factors play a great role in aircraft accidents and improving human factors training is critical to the resolution of this problem.

Besides presentations given by those in the field of aerospace medicine, a number of talks were given by pilots, giving the attendees the opportunity to hear their points of view. Interestingly, the pilots gave emphasis to crew resource management.

Although the Conference focused on human factors, there were other very interesting lectures given on forensic dentistry as a means of casualty identification and on the effects of radiation in civil air operations. There was a lively discussion on the significance of radiation exposure in flight with some regarding it as a clear danger to health while others felt that the danger was not so compelling.

There were also lectures on sleep disorders, treatment of dyslipidemias, and diabetes. It appears that there is an obesity epidemic in Mexico much like there is in the U.S. Other topics included fatigue countermeasures, post-traumatic stress disorder, and women in aviation. Dr. Christensen also reviewed ICAO policy regarding the Age-60 Rule and informed the audience that ICAO is currently considering an age 65 limit in multicrew operations.

Acapulco was a beautiful venue for this meeting, with mountains and beaches surrounding the hotel. The closing banquet was very enjoyable, with the AMMA conferring Honorary Membership upon Silvio Finkelstein, Jon Jordan, Melchor Antuñano, and Russell Rayman.

I WANT YOU!

Our membership has been flat at about 3,300 for the past 5 years. We now want to increase our rolls. I WANT YOU to get a new member for AsMA sometime during the next 6-12 months. Ask a colleague in your institution or workplace and consider giving an AsMA membership as a gift to a deserving colleague. Let's all get behind this and surge. I will keep you posted on how we are doing. Thank you.

This Month in Aerospace Medicine History-- October 2004

By Walter Dalitsch III, M.D., M.P.H.

Fifty Years Ago

Consideration of man in space: "Events of the past few years indicate that travel above the atmosphere in a medium without drag other than the pull of gravity is within the range of the feasible. This present year may well be a turning point in our thinking from 'Is flight above the atmosphere feasible?' to 'Exactly what are the requirements for its accomplishment?' If an unmanned vehicle can be sent into those reaches then it certainly will not be long before man will wish to accompany the vehicle. If rapid scientific progress in the field continues...then an era of travel above the atmosphere is in the not too distant future." (1)

The flight surgeon: "The close association of the aviation medical doctor and the fighting airman has often led to the physician becoming a member of aircrew. Even if he is not qualified to 'wings' standard, he is at least an intimate part of the fighting team. He is present at briefing and de-briefing; he rejoices in the victories and belittles the defeats. In many cases he may be the oldest member of the wing or squadron and as such give the sense of continuity and *esprit de corps* which is so important. Sometimes, to solve a problem or to satisfy some personal question, he may go along as 'supercargo,' or on occasions he may complete an operational tour even as a fighter pilot. As an aviator type of doctor the flying personnel medical officer has the usual number of unpleasant tasks to perform. Investigation of fatal accidents, assessment for 'lack of moral fibre,' wastage rates in aircrew training, and the grounding of his aircrew friends for medical reasons are all part of his duty. Ideally, the F.P.M.O. is a member of aircrew, but this is by no means mandatory. Even if he is a 'flying doctor,' his usefulness is measured by his knowledge and ability as a flight surgeon rather than his ability as an airman." (6)

Toxic occupational exposures: "The thesis is developed that no substance is so toxic that it cannot be used by the knowledgeable and none so non-toxic that it can be used without caution. Working limits for concentrations of injurious substances in the workroom air are stated as maximum allowable concentrations, threshold limit values, or industrial hygiene standards. The threshold limits list includes those natural minerals, oils, and chemical substances including economic poisons but excludes radioactive materials. The value for a toxic substance is assigned on the basis of data accumulated from animal inhalation toxicity studies, that opinions of industrial hygienists, the current toxicological literature, and also by consideration of the annoying or irritating effects of the agent on the 'total man.' It is considered desirable to assign a maximal upper limit of 1,000 p.p.m. for most, although not all, of the gases and vapors that are apparently non-toxic or non-hazardous. This practice tends to prevent excessive or wanton exposure to air contaminants. All insoluble dusts are sus-

pect until proved otherwise. The assignment of a specific level of toxicity for each mineral dust is currently impossible. A level of from two to five million particles per cubic foot is suggested for silica-bearing dusts." (5)

Twenty-five Years Ago

Inadequacy of the Valsalva maneuver during the physical exam (ENT Department, University of Lund, Malmö, Sweden): "A comprehensive study of Eustachian tube function in 84 aspirants accepted for flight training was made. Using a pressure chamber, both static and dynamic pressure changes, as in ascent and descent, were applied to test the tubal pressure equilibrating capacity in the sitting position. While all 84 were otologically healthy, a wide range in the pressure equilibrating capacity was found - 20% could not equilibrate static over- and underpressures of 10 cm H₂O completely, 8% could not equilibrate at all during simulated descent, 3 subjects reported acute vertigo during simulated ascent in combination with high unilateral middle ear pressure. Asymmetry between ears of single subjects in pressure equilibrating capacity was also found to a large extent. It was not possible to identify subjects with poor equilibrating capacity by simple tests like Valsalva's or Toynbee's manoeuvres. The results may indicate that today's criteria for Eustachian tube function in the selection of airmen can be made more efficient." (2)

Anemia secondary to moderate exercise (Defence and Civil Institute of Environmental Medicine, Downsview, Ontario, Canada, and Centre de Recherches du Service de Sante des Armees, Lyon Cedex 1, France): "Hematological changes were studied in physically fit young soldiers who marched 35 km/d for 6 d, working at 35% of their VO_{2max}. Four days of marching produced decreases in numbers of erythrocytes (RBC) and in hematocrit (Hct). This 'sports anemia' persisted beyond day 6 into the post-march period and was accompanied by decreases in hemoglobin (Hb), mean corpuscular hemoglobin (MCH), mean corpuscular hemoglobin concentration (MCHC), and mean corpuscular volume (MCV). The latter decrease was attributed to a preferential destruction of large RBC. The post-march period was characterized by an early (2 d) recovery of RBC numbers, Hct, and MCV, and a persistent (>4 d) decrease in Hb, MCH, and MCHC. This pattern, characteristic of hypochromic macrocytosis, possibly reflects a premature release of young RBC from the bone marrow. Clearly, 'sports anemia,' previously reported to occur with intensive physical exercise, can also result from sustained and repetitive submaximal exercise." (3)

Monitoring of emotional stress in aviation (Institute of Higher Nervous Activity and Neurophysiology, Academy of Sciences, Moscow, USSR): "The level of emotional stress depending on the power of motivation and the estimation by the subject of the probability (possibility) of goal achievement, largely influences the operator's skill performance (that of a pilot, controller, astronaut). A decrease in the emotional tonus leads to drowsiness, lack of vigilance, missing of significant signals, and to slower reactions. The extremely high stress level disorganizes the activity, complicates it with a trend toward

untimely acts and reactions to the insignificant signals (false alarms). The best methods to monitor the degree of the operator's emotional state during his skill performance are the integral estimation of the changes in heart-rate and T-peak amplitude, as well as the analysis of spectral and intonational characteristics of the human voice during radio conversation. These methods were tested on paratroopers, pilots in civil aviation, and airport controllers." (4)

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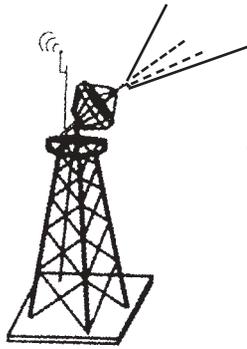
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Science & Technology Watch

Keeping You Informed Of The Latest Advances In Science And Technology

Operator-Machine Interface and Artificial Life

Valerie E. Martindale, Lt. Col., USAF, BSC

Aviators have largely come to terms with automation, in the sense of developing an appropriate set of expectations. Familiarity has led to expectations about system capabilities, limitations, and operator interface modes. Reliability continues to improve, and error trapping is refined with experience. Certain types of error are anticipated and human behaviors are altered to compensate. Certain types of task requiring "judgment" simply are not automated. The trend is clearly toward more automation. But when does automation become automation? When is a system autonomous? What is meant by semiautonomous? Colin Schmidt of Le Mans University in France argues that new expectations, and new terminology, must be developed for a category of object called "artificial life" (Colin T. Schmidt, "Let Me Introduce You to My Non-agent," *The Logic of Artificial Life*, Harald Schaub, Frank Detje, Ulrike Brüggemann eds, Akademische Verlagsgesellschaft Aka GmbH, Berlin, 2004, pp122-127). Aviation is certain to be a future habitat for this new creature.

For most of human history, objects fell into three categories: human, animal, and inanimate. Not too long ago, computers blurred those categories, at times seeming smarter than humans and at others dumber than a rock. By now operators are accustomed to them: computers have their own category, and humans have a well developed set of expectations with regard to their behavior. Artificial Life is the next step along the cyber-evolutionary path.

Artificial Life (A-Life, for short) is a term which describes a new category of object, not intelligent but autonomous, at least to some extent. Recently the 6th German Workshop on Artificial Life brought together a small, diverse community from 23 countries to discuss the current state and future prospects of this new category. A-Life objects can come up with novel solutions, learn and forget, and in some cases even display emotion, but do not approach human intelligence. A-Life is defined by certain life-like properties, such as autonomy and self-preservation, "social" interaction, and complex interaction with the "environment." Some very simple forms of A-Life are already among us—autonomous

vacuum cleaners, for example. Many forms of A-Life may never take corporeal form. They are software agents. In addition to hosts of experimental forms with little or no practical use, there are self-learning, personalized search engines and "intelligent tutors." Ultimately these agents will deal with each other and with humans in a web of relationships, much like a human community. Dr. Schmidt's argument is that the differences are at least as important as the similarities. Humans cannot interact comfortably with a range of "agents" without knowing their properties. Humans can make some instant assumptions when dealing with other humans, which turn out to be quite reliable. The same cannot be said of assumptions about A-Life.

Real world examples of A-Life, like the vacuum cleaner, remain simplistic and relegated to simple tasks. Evolutionarily they have just climbed out of the primordial silicon soup. There is no doubt that they are poised for rapid development, but their direction, and evolutionary fitness, will depend on how they interact with humans. For aviators, the first form of A-Life may be Auto GCAS. The Automatic Ground Collision Avoidance Systems (Auto GCAS) responds to critically low altitude appropriately, either leaving the pilot in control if gear is down and airspeed good, or taking control and initiating a safe climb if gear is up or airspeed is inappropriate. Such an act of "self-preservation," coupled with finding a solution autonomously, will cross the border from mere automation to A-Life.

Auto GCAS, a creation of the Air Force Research Laboratory, was successfully tested in 1996, four years after its development, on a Lockheed-Martin F-16 (Ramon Lopez, "Avoiding Collision in the Age of UAVs," *Aerospace America*, Jun 2002). The Swedish Air Force became interested, and through an international agreement the US and Sweden improved the system, but neither country has yet fielded it in any aircraft. (Of interest, the Swedish Air Force published its intent to introduce Auto ACAS, the Automated Airborne Collision Avoidance System, in the Gripen ("Automatic Collision Avoidance will Revolutionize Combat Flight Safety," *Gripen News*, 2003 #2, pp 2-3).

The technical threshold for Auto GCAS is low. The system exists in usable, tested form. The financial threshold may also be considered low. Military aircraft losses to non-combat mishaps, civilian aircraft losses to mishap, and losses of aircraft and ground targets to terrorists, put the cost of the system in perspective (See "Expert panel: Engineers will lead charge in battle of technology vs. terrorism," *ASME News* 2001). The psychological threshold is huge. Auto GCAS does not just maintain the aircraft. It controls the aircraft, making decisions and judgments—it takes some control away from the pilot. (This occurs within a very limited context: Auto GCAS thresholds are set by the pilot to correspond to mission requirements, the system must be turned on by the pilot, and it can be disconnected by a number of methods. For an excellent account of the system, see <http://www.f-16.net/modules.php?op=modload&name=Sections&file=index&req=viewarticle&artid=13> on the F-16.net website.)

The critical questions on how to deal with A-Life are familiar. They come from the history of integration of automation, the precursor systems. How reliable is the system? Where and how does the human fit in? How much does the human trust the system? How much *should* the human trust the system? Each gain in system autonomy takes away a little human control, and from an aviator's point of view, control is the object of aviation. In human relationships, trust is the substitute for control. Trust in automation is a well-recognized issue in human factors and operator-machine interface. Trust in A-Life is an order of magnitude more difficult. Dr. Schmidt argues that progress in this direction cannot be made until the faceless "agents" of A-Life acquire distinct identities that can be learned, and linked with expectations, much as individual humans learn about other individuals. A-Life, he says, is a "new category that is *much* too vast to contain what they [A-Life researchers] wish it to contain—*who's* and *it's*." (ibid p. 125, emphasis in original) Appropriate terminology "can contribute to helping who-users excel in environments including A-Life creatures on a large scale in the future."

If Auto-GCAS becomes aviation's first A-Life creature, Dr. Schmidt's criteria for successful interaction are already in place. It has a specific purpose and limited domain, and expectations for it are clear. The mode of human communication is non-verbal, consisting of aircraft state, but clear and unambiguous. Aviation has historically proven to be a very conservative community, and appropriate caution has been applied to the Auto-GCAS program from the start. The next step, the earning of trust, cannot occur without fielding the system. It should not occur without cognizance of how significant the development is. It will be the first presence of A-Life on the flight deck.

If, or rather when, it is successful, the path will be opened for other, increasingly complex A-Life-forms. A fundamental choice at every step along the way, which can only be made by humans, is what role each system will have in the aviation community. Exactly which human actions will it be permitted to carry out, to prevent, and ultimately to control? Clearly trust is the *sine qua non*. Trust requires recognition—systems must be clearly identifiable and known individually. Trust requires familiarity—a system's domain and limitations must be known, and its "motivation." As A-Life gains a foothold, there will be plenty of work for human-factors engineers, designing interfaces and system properties to conform to the requirements of human trust. The pay-off has long been envisioned by writers of science-fiction: the pilot and the craft are a team.

The AsMA Science and Technology Committee provides this Science and Technology Watch Column as a forum to introduce and discuss a variety of topics involving all aspects of civil and military aerospace medicine. The Watch can accommodate up to three columns of text, which may include a figure or picture to illustrate your concept.

Please send your submissions via e-mail to: len.goodman@drdc-rddc.gc.ca.

Aerospace Physiology Society News

Election Results

Congratulations to the following newly elected officers of the Aerospace Physiology Society: COL Jim Dooley, BSC, USAF, President elect; LtCOL Valerie Martindale, BSC, USAF, Secretary; and CAPT Nereyda Sevilla, BSC, USAF, Bibliographer.

At the last business meeting, the Society decided to explore utilizing our website for conducting future elections. We are moving forward with this effort, and plan on conducting next year's election online. Please check the Society's website and the March '05 issue of the AsMA journal for additional information.

MIT team lets one airplane speak to another in plain English

Aeronautics researchers at MIT have developed an aircraft guidance system that allows a pilot in one plane to guide a separate, pilotless airplane by speaking commands in English.

In a flight test, the pilotless vehicle, called a UAV (unmanned aerial vehicle), responded to sudden changes in plan and avoided unexpected threats en route to its destination in real time.

"The system allows the pilot to interface with the UAV at a high level—not just 'turn right, turn left' but 'fly to this region and perform this task,'" said Mario Valenti, a flight controls engineer for Boeing who is on leave to pursue a Ph.D. in electrical engineering and computer science at MIT. "The pilot essentially treats the UAV as a wingman," said Valenti, comparing the UAV to a companion pilot in a fighter-plane squadron.

Tom Schouwenaars, a Ph.D. candidate in aeronautics and astronautics, and Valenti are principal researchers on the guidance system, which is part of the capstone demonstration of the Software Enabled Control (SEC) program. Professors Eric Feron and Jonathan How of the Department of Aeronautics and Astronautics (aero/astro) are among the principal investigators on the SEC program.

The SEC program is a five-year, inter-university effort sponsored by the Defense Advanced Research Projects Agency (DARPA) through the Air Force Research Laboratory. As industry partner, Boeing provided the avionics test platform for the MIT guidance system and the planes used to demonstrate it.

The new guidance system is designed for volatile combat situations. For instance, a pilot might be commanded to gather images of an enemy site located in unknown territory. Rather than putting himself in danger, the pilot could assign a nearby UAV to the task. The UAV moves toward the enemy site, avoiding known threats (no-fly zones) and the unexpected (radar emanating from a missile site), all the while communicating its actions to the pilot in the other aircraft, which follows behind at a higher altitude and a safe distance. The

technology also could have applications in the coordination of multiple air or space vehicles, such as in air traffic control or the re-configuration of distributed satellite systems.

The guidance system performed flawlessly in flight tests involving a Boeing F-15 fighter jet and a Lockheed T-33 trainer fighter jet at Edwards Air Force Base in June. A pilot in the manned F-15 issued mission-level commands in everyday English—"fly to Task Area B"—to the T-33, and the T-33 executed them, maintaining a trajectory safe from threats, and at one point adjusting to a last-minute change in the predetermined mission plan. The T-33 was a substitute for the actual UAV in the test. It was manned by a pilot and crewperson who

were on board to manage the aircraft in case of failure, but the vehicle was controlled entirely by MIT's software, which ran on laptops placed inside each plane.

A paper published by the American Institute of Aeronautics and Astronautics (AIAA) in August discussed the results of the flight test in more detail. Aero/astro graduate student Yoshiaki Kuwata and James L. Paunicka, associate technical fellow at Boeing Phantom Works, authored the paper along with Feron, How, Schouwenaars and Valenti. Schouwenaars' work on autonomous trajectory-planning algorithms earned him the AIAA's Unmanned Aerial Vehicles Graduate Award, which he will receive at a conference in Reno, NV, in January.

ISTM Offers Certificate of Knowledge in Travel Medicine

The International Society of Travel Medicine (ISTM) will offer its Certificate of Knowledge in Travel Medicine Examination on May 1, 2005, in Lisbon, Portugal, prior to the opening of the 9th Conference of the International Society of Travel Medicine. Those passing the exam will receive a Certificate in Travel Health[®], or CTH[®]. The exam is open to all travel medicine practitioners, including physicians, nurses, pharmacists, and others. The same exam will be given to all practitioners and will be administered in English. To obtain more information about the exam, please access the ISTM website at www.istm.org.

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AsMA Future Meetings

May 8-12, 2005
Kansas City, MO
Hyatt Regency Crown Center

May 14-18, 2006
Caribe Royale Hotel
Orlando, FL

May 13-17, 2007
Sheraton and Marriott Hotels
New Orleans

May 11-15, 2008
Sheraton and Hilton Hotels
Boston, MA

May 3-7, 2009
Westin Bonaventure Hotel
Los Angeles, CA

MEETINGS CALENDAR 2005

January 26-29, 2005, Long Beach, CA.

The 13th Annual Medicine Meets Virtual Reality Conference, organized by Aligned Management Associates, Inc. Info: www.nextmed.com/mmvv_virtual_reality.html; mmvr13@nextmed.com.

February 15-18, 2005, Galveston, TX.

Pushing the Envelope, Medicine in Challenging Environments Conference & 26th Annual Operational Aeromedical Problems Course. For information, go to <http://www.trueresearch.org/mice/index.asp> or contact Devin Rokyta, Seminar Manager, d.rokyta@trueresearch.org; or Natalie Biggers, Seminar Assistant, T.R.U.E. Research Foundation, 8610 N. New Braunfels, Suite 705, San Antonio, TX 78217, 210-829-1239, FAX 210-829-5513, n.biggers@trueresearch.org.

February 24-25, 2005, Washington, DC.

Homeland Defense Training Conference—Medical Planning and Operations in Support of Consequence Management: "Managing the Unthinkable in the Era of Asymmetrical Threats." For information, contact Maurice Martin, Market Access International, 4301 Wilson Blvd. #1003, Arlington, VA 22203; (703) 807-2753; FAX (703) 807-2728; mmartin@marketaccess.org; www.marketaccess.org/event_consngmt.asp.

May 22-26, 2005, Graz, Austria. 15th IAA Humans in Space Symposium. For more information, visit <http://www.uni-graz.at/space2005>.

July 22-27, 2005, Las Vegas, NV. 11th International Conference on Human-Computer Interaction. Further info: HCI International 2005, School of Industrial Engineering, Purdue University, Grissom Hall, 315 N. Grant St., West Lafayette, IN 47907; hcii2005.engr.wisc.edu

September 15-18, 2005, Gold Coast, Queensland, Australia. Conjoint Meeting of the Australasian Society of Aerospace Medicine (ASAM) and the Asia Pacific Federation of Aerospace Medical Associations (APFAMA). The Annual Scientific Meeting of ASAM, together with the 5th Asia Pacific Congress of Aerospace Medicine (APCASM). Contact: Anne Fleming, ASAM Secretariat, +61 3 98991686. fleminga@bigpond.net.au; www.asam.org.au.

WING NEWS & NOTES

Wing News

By Harriet Hodgson

Are you reading this AsMA journal at home, or did you find it at the office under a coffee cup? Many Wing members have told me they never see the journal and that's a shame. (Spouses take note--share your journal!) Dale Orford has done a spectacular job of reporting and ferreting out stories. If you've been reading the Wing page you have a sense of what I've been writing about.

My articles focus on what the Wing has done for me, including my days as a new member, the friends I've made, updating the bylaws, our dedicated volunteers, traveling with the AsMA advance team, Wing tours, Kansas City barbecue, giving thanks and holiday celebrations. You haven't read all of these articles yet, but they're coming your way.

Though I may be wrong, I think this is the first time a president has written a series of articles like this. I want you to know that the Wing means a lot to me. I want you to know that I'm proud to represent you. Most of all, I want you to know your membership is important. Whether we live in the U.S. or other countries, we are linked together by our interest in aviation and space medicine. These links are strong and connect us as surely as if we were holding hands.

So ask your kind, loving, sweet, good looking, and savvy partner (add more descriptive words here if you wish) to bring the journal home. Turn to the Wing page and catch up on the news. Write the dates of the Wing meeting on your calendar and make your travel plans now. I want to see your smiling face in Kansas City. Your attendance will help to make this one of the best meetings ever.

If you are unable to come to the meeting, please contact our publicity chair at dorford@cox.net and tell her what you've been doing. Have you changed jobs? Did you move? Are you volunteering in your community? What's your latest hobby? Did you receive an award? We want "hot news" on the Wing page and that news comes from you.

Kansas City - Here We Come!

By Mariette Jones, Arrangements Chair

It's that time again. Fill out your advance registration forms and send them in ASAP. The "City of Fountains" will charm and embrace you with open arms with its romantic outdoor cafes, horse-drawn carriages, shopping, and eclectic mix of attractions. The fun begins at Registration and Hospitality where you can chat with old and new friends and discuss the upcoming tours. As usual, we have a delightful week planned for you.

Tuesday morning, we board our deluxe motor coach for Powell Gardens, a 915-acre paradise bursting with vivid perennial gardens, winding pathways with brooks and waterfalls, wildflower meadows, a new island garden set in the 12-acre lake, and striking architecture.

The Island Garden, opened in 2001, showcases nearly 800 varieties of native and exotic water plants, rock gardens, and ornamental trees. From there, you will enjoy the three-pooled cascading waterfall, and an uninterrupted view of the stunning Marjorie Powell Allen Chapel. Designed by Arkansas architect Fay Jones, this breathtaking cedar, glass, and stone triangle soars to the sky.

Don't miss the Wildflower Meadow where you'll enter the cool and serene Rock and Waterfall Garden. There you can enjoy the many shades of ferns, and nearly 50 varieties of hostas. In May, we should be able to take in the beautiful flowering trees from a secluded bench in these enchanted woods. Over the bridge, don't miss the 3.5-acre Perennial Garden with over 5,000 plantings, the largest in the Midwest. The curving walkways twist and turn to a peaceful pavilion overlooking the lake. Time to Eat!

Go back to the Visitor's Center and enjoy your lunch at the Thyme Café. Rest and relax now because the best is yet to come! We're taking you to the oldest shopping center in the country, so don't forget to bring an extra suitcase and good walking shoes! The bus will drop us off at the famous Country Club Plaza for some serious shopping. If you're worn out, you can be dropped off at the Hyatt first.

First, you'll be amazed at the beauty of Country Club Plaza. Imagine a 14-block area of Spanish architecture modeled after Seville, Spain, and brimming with over 180 upscale retailers, restaurants, antiques shops, and small boutiques. Move over Rodeo Drive! Armani, here we come! When you get tired, just sit at an outdoor café on the Piazza and revel in the many fountains perched on nearly every corner. History abounds! Or, take a carriage ride and let the horses do the walking! Or, take a 30-minute narrated cruise along the meandering landscaped River Walk on Brush Creek. You could always go back with your spouse for a romantic evening. Beginning in May, the Plaza courtyards come alive with free concerts representing some of the best jazz, blues, and folk music from 5:00 pm to 8:00 pm every Thursday, then on Saturday and Sunday from noon to 5:00 pm. Enjoy these venues sipping your latte, or perched on the side of a beautiful fountain. Don't miss this tour!

Arabia Steamboat Museum

Thursday morning, we leave by deluxe motor coach for the River Market District to visit a "fascinating time capsule of life in the mid-1800s."

The 171-foot steamboat Arabia sank quickly when it hit a "snag," a thick trunk of a huge, fallen walnut tree. All 130 passengers and crew escaped unharmed except for a lone mule that sadly did not make it. Over the next few days, the Arabia completely disappeared along with its 222-ton cargo with merchandise bound for frontier stores, personal belongings of the passengers, and 400 barrels of fine Kentucky bourbon.

Eventually, in 1987 David Hawley and his crew found the wreck lying over 0.5 mile from the River's edge, and buried 45 ft underground

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in the middle of a Kansas farm field. Excavation began and boxes, barrels, and crates of precious frontier cargo were discovered. Every box was unique, revealing new wonders: ten thousand calico buttons were found in perfect shape. Ten million glass trade beads, all perfectly preserved. Beautiful glass bottles, some containing preserved fruits for pies and bright green sweet pickles - still edible! You can even sample a reproduction sample of French perfume that was recovered - scent intact! These and many more treasures from 1856 can be viewed at the museum. A must see!

But, we're not done yet. We're headed for the Webster School House for a magnificent lunch. Built in the early 1900s, this Romanesque Revival building has lovingly been renovated to hold marvelous antiques and decorative accessories, as well as a charming gourmet restaurant. Don't miss this tour!

Hurry and sign up for tours now! Don't miss out by waiting until you get to the meeting. Send in your Advance Registration form Pronto! See you in Kansas City!

Meet Sandi Antuñano - Honorary President

Sandi Antuñano is wife of current AsMA president Melchor Antuñano. A native of



Ohio, she grew up on Kelley's Island on Lake Erie, where her father was a commercial fisherman. She really enjoyed the tourist-driven lifestyle of her small community with its cottages full of summer visitors, its laid-back ambiance, and activities such as hiking, fishing, and scuba diving amongst the great shipwrecks of times gone by. So much so, in fact, that she vowed to never become a "mainlander," but as she says with a laugh, "Never say never. I now find myself living in landlocked Oklahoma!"

As a busy mother of two teenage boys, Sandi has become very involved in her local Parent Teachers' Association as well as volunteering with her sons at the Humane Society's Animal Shelter where they walk and care for the dogs. She says, "It is satisfying and uplifting because we always get as much love from the dogs as we give them. Usually more!" Last year they also participated in a Church mission to Acuna, Mexico.

Sandi is new to the Wing, having first experienced our hospitality in Anchorage. She says, "We took our boys out of school so that they could join us in Alaska. We met many interesting and exceptional people, and I am excited to have another avenue for broadening my friendships."

DON'T PROCRASTINATE!

Send your advance registration form in today!

NEWS OF MEMBERS

Send information for publication on this page to: **News of Members**
Aerospace Medical Association
320 S. Henry Street
Alexandria, VA 22314-3579
pday@asma.org

Walter R. Cayce, Col., USAF, MC, SFS, of San Antonio, TX, once the Director of Medical Education and Occupational Medicine Program director at the School of Aerospace Medicine, is now the Commander of the 18th Aerospace Medicine Squadron at Kaden AFB, Japan.

Todd A. Guth, LT, MC, USNR, of San Diego, CA, formerly a flight surgeon for Carrier Air Wing Three at Naval Air Station Jacksonville, FL, has been transferred to VRC-30, Fleet Logistics Support Squadron 30 at Naval Air Station North Island, CA. He is still a flight surgeon and recently was awarded a Navy commendation medal.

David R. Jones, M.D., M.P.H., has given several lectures this fall. He presented a four-hour block on Aviation and Combat Psychiatry to the Aviation Psychology Course at Fort Rucker, AL, in early October. During a trip to Cairo, Egypt, Dr. Jones addressed a meeting of the Egyptian Psychiatric Association on the subject of "Aviation Psychiatry: An Introduction." At the same meeting, **Dr. (Brig. Gen.) Hussein Morsy** presented his research on stress and performance in the human centrifuge. Later, Dr. Jones was on the faculty of the three-day Bombardier Safety Standdown in Wichita, KS, which featured many well-known aviators and astronauts. Among the presenters were aviation psychologists Jerome Berlin, Ph.D., of Embry-Riddle Aeronautical University and Mark Rosekind, Ph.D., President and Chief Scientist of "Alternate Solutions, Inc." Dr. Jones spoke on "Applied Aviation Psychiatry: Making Decisions Under Stress."

CDR Mark D. Pressley, MC, FS, USN, of Fredericksburg, VA, has been promoted from LCDR to CDR and has been transferred.

Lt.Col. Charles R. (Charlie) Tupper recently took the oath of office to re-enter the U.S. Air Force Reserve as a member of the 315 Aeromedical Evacuation Squadron (AMC) at Charleston AFB, SC. Charlie retired from active duty (AD) in the USAF in January 2003; his last AD assignment was Commander,



Major Mike Lundy (L) congratulates Lt.Col. Charlie Tupper (R) following the oath of office for the U.S. Air Force Reserve.

43d Medical Operations Squadron and Chief Nurse for the 43d Medical Group at Pope AFB, NC. One of a hand-full of officers approved for this "Retired to Reserves" program, Charlie has started his third Air Force career (AD enlisted 1970-1974, AD officer 1979-2003, and Reserve officer, 2004-present). His current position is as Resident Care Manager of the Nursing Home Care Unit at the Ralph H. Johnson Veterans Affairs Medical Center in Charleston, SC.

The Slovenian Aerospace Medical Association (SAsMA) held its 3rd Annual Scientific Meeting in Ljubljana, Slovenia, Oct. 18-22, 2004. At the closing banquet, Honorary Membership in the SAsMA was conferred upon **Lt. Gen. George P. Taylor, USAF Surgeon General; Brig. Gen. Erich Roedig, Surgeon General, German Air Force; and Dr. Russell B. Rayman, Executive Director, AsMA**. Drs. Taylor, Roedig, and Rayman delivered the Edvard Rusjan, Brothers Kuscer, and Herman Potocnik Lectures, respectively.



YOU CAN READ OUR JOURNAL ANYWHERE!—Michael Barratt, M.D., was a crewmember on the NEEMO VII (NASA Extreme Environment Mission Operations) mission last October. The mission used the Aquarius habitat, which is located in about 60 ft of water off the coast of Florida near Key Largo, and managed by the National Undersea Research Center (NURC). It is a terrific analog of spaceflight, with the size pretty close to an ISS module, six people living in saturation (so they can't come out quickly), and technical diving rig operations similar to EVA. Their mission was dedicated to telemedicine and telerobotic surgery, and they tended a "payload" from the Canadian Center for Minimal Access Surgery. There are many terrestrial and space applications for this type of mission. The crew was composed of three astronauts (Bob Thirsk, Cady Coleman, and Mike Barratt), a telerobotic surgeon from North Bay, Ontario (Craig McKinley), and two NURC habitat operators (James Talacek and Billy Cooksey). Barratt is pictured sitting at one of the more popular spots - near the galley table window. He didn't have much time to sit and read, actually, but sitting there he never knew what creatures might come by to visit.

William B. Klein, Col., USAF, MC, CFS, of Bonaire, GA, recently received the Bronze Star and the Air Medal for services rendered in Iraq.

Dr. Vincente R. Ciancio, President of the Argentine Aerospace Medical Association, was honored with an Honorary Membership by the Brazilian Society of Aerospace Medicine at an aerospace medical meeting in Rio de Janeiro, Brazil, in October of last year.



Dr. Paulo Magalhaes Alves, President of the Brazilian Society of Aerospace Medicine, presents Dr. Vincente R. Ciancio with the official diploma and medal of an Honorary Member.

New Members

Abadie, Wesley M., M.D., Carrollton, TX
 Anderson, Mark A., Capt., USAF, MC, APO, AE
 Bailey, Jeffrey A., Lt.Col., USAF, MC, St. Louis, MO
 Balintona, Joanne M., Capt., USAF, MC, FS, Sacramento, CA
 Bonar, James P., Lt.Col., USAF, MC, FS, San Antonio, TX
 Cannon, James C., Ph.D., Lexena, KS
 Cardoza-Favarato, Gabriella, M.D., Lancaster, CA
 Carlson, Chester L., CAPT, ANG, Jenks, OK
 Crowder, Michael W., Capt., USAF, MC, FS, Suisun City, CA
 Erlandson, Michael D., Capt., USAF, MC, Omaha, NE
 Flemmons, Meghan S., Capt., USAF, MC, FS, Round Rock, TX
 Foy, Curtis M., Capt., USAF, MC, Fairchild AFB, WA
 Gorelik, Dmitry, Capt., USAF, MC, FS, Reisterstown, MD
 Groat, Brian J., Capt., USAF, MC, FS, Monument, CO
 Hanson, Kenneth C., MAJ, MC, ANG, Muncie, IL
 Harrah, John D., M.D., Fort Walton Beach, FL
 Heaton, Rooney G., D.O., Butte, MT
 Heerema, Bret D., Capt., USAF, MC, FS, Warner Robins, GA
 Hemler, Douglas E., Lt.Col., USAFR, MC, Golden, CO
 Hudkins, Matthew L., Capt., USAF, MC, FS, Alamogordo, NM
 Janson, Lee W., Maj., USAF, MC, FS, APO, AE

Jenkins, Brian D., Capt., USAF, MC, Brooks City-Base, TX
 Joas, Chris S., LT, MC, USN, FS, Pensacola, FL
 Lawlor, Joseph C., Maj., USAFR, MC, Waterford, OH
 Lee, Maximilian S., Maj., USAF, MC, San Antonio, TX
 Madrid, Michael A., Maj., USAF, MC, Waddell, AZ
 McAuley, Darren C., CAPT, MC, ANG, South Orange, NJ
 McCauley, Shane N., Capt., USAF, MC, FS, Syracuse, NY
 Momeni, Arash K., Capt., USAF, MC, FS, Seattle, WA
 Money, Nisha N., Capt., USAF, MC, FS, Wichita, KS
 Morgan, Patrick M., MAJ, MC, ANG, Columbia, SC
 Nalda, Ruben H., M.D., Shiloh, IL
 Palmer, Wesley D., Maj., USAF, MC, APO, AP
 Panal, Ramonito H., M.D., Yuma, AZ
 Pangia, Jonathan E., D.O., Philadelphia, PA
 Rouse, Murray E., MAJ, MC, ANG, Puyallup, WA
 Ruth, Timothy M., Maj., USAF, MC, Boise, ID
 Sanders, Robert W., B.A., M.S., Chicago, IL
 Sarmiento, Laura A., Houston, TX
 Schmidt, Micah D., Capt., USAF, MC, FS, San Antonio, TX
 Shue, Christian B., 1Lt., USAF, Platte City, MO
 Silvers, Heather M., Capt., USAF, MC, FS, Enid, OK
 Sinno, Mona A., M.D., APO, AP
 Spurgeon, Jade M., Capt., USAF, MC, FS, San Antonio, TX
 Steiner, Shane C., Capt., USAF, MC, FS, Brooks City-Base, TX
 Ulissey, Lars A., B.S., Mountain Green, UT
 Waddell, George A., Maj., USAF, MC, FS, Marietta, MS
 Werner, Mark E., Lt.Col., USAF, MC, San Antonio, TX
 Wiegand, Robb J., Capt., USAF, MC, FS, Beavercreek, OH
 Williams, Vanessa K., Capt., USAF, MC, Columbia, SC
 Winkler, Anita J., Maj., USAF, MC, Aurora, CO
 Wojnicki, Jared A., Capt., USAF, MC, Enid, OK
 Woods, Henry A., Maj., USAF, MC, San Angelo, TX
 Yoosefian, Farida, M.D., Rosamonda, CA
 Zaleski, Scott D., Maj., USAF, MC, FS, Barksdale AFB, LA

International New Members

Chiang, Kwo-Tsao, Maj., M.B., Gangshan Town, Kaohsiung County, Taiwan
 Sardar, Hashim Khan M., Dr., Safat, Kuwait

Remember!

Business Meetings are open to ALL members of the AsMA. Your input and attendance are always welcome. The next meeting will be on May 10, 2005, in Kansas City, MO.

Workplace Partnership for Life

The Department of Health and Human Services has a new national Gift of Life Donation initiative called the Workplace Partnership for Life, an organ-donation program. With approximately 80,000 Americans waiting for organ transplants, a single donor can save or enhance 50 of those lives. This program makes it easy for people, their organizations, staff, and members to get involved. To fill out a donation card and sign up for the program, go to www.workplacepartnership4life.org. And when you sign up, it is very important that you do not forget to make your wishes known to your family. Telling your family is the most important part of the decision to become an organ donor.

NEW WEBSITE NOW ONLINE!!

AsMA's new web site now has new features!

- ★ Members can update address and phone number online
- ★ Register for the annual meeting online
- ★ Links to meeting hotels
- ★ Updated announcement page
- ★ New journal page

VISIT THE NEW WEB SITE TODAY!!

****MEMBERS*MEMBERS****

Have you recruited a new member yet? If each one of us recruited at least one new member, we could actually double our membership with a mere stroke of the pen. Let's keep the momentum going. Adopt the slogan:

"EVERY MEMBER GET A MEMBER."

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Corporate Members

The financial resources of individual members alone cannot sustain the Association's pursuit of its broad national goals and objectives. Its 76-year history is documented by innumerable medical contributions toward flying health and safety that have become daily expectations by the world's entire flying population—commercial, military, and private aviation. However, support from private and industrial sources is essential. The following organizations, who share the Association's objectives or have benefited from its past or current activities, have affirmed their support of the Association through Corporate Membership.

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- Scandinavian Airlines System
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