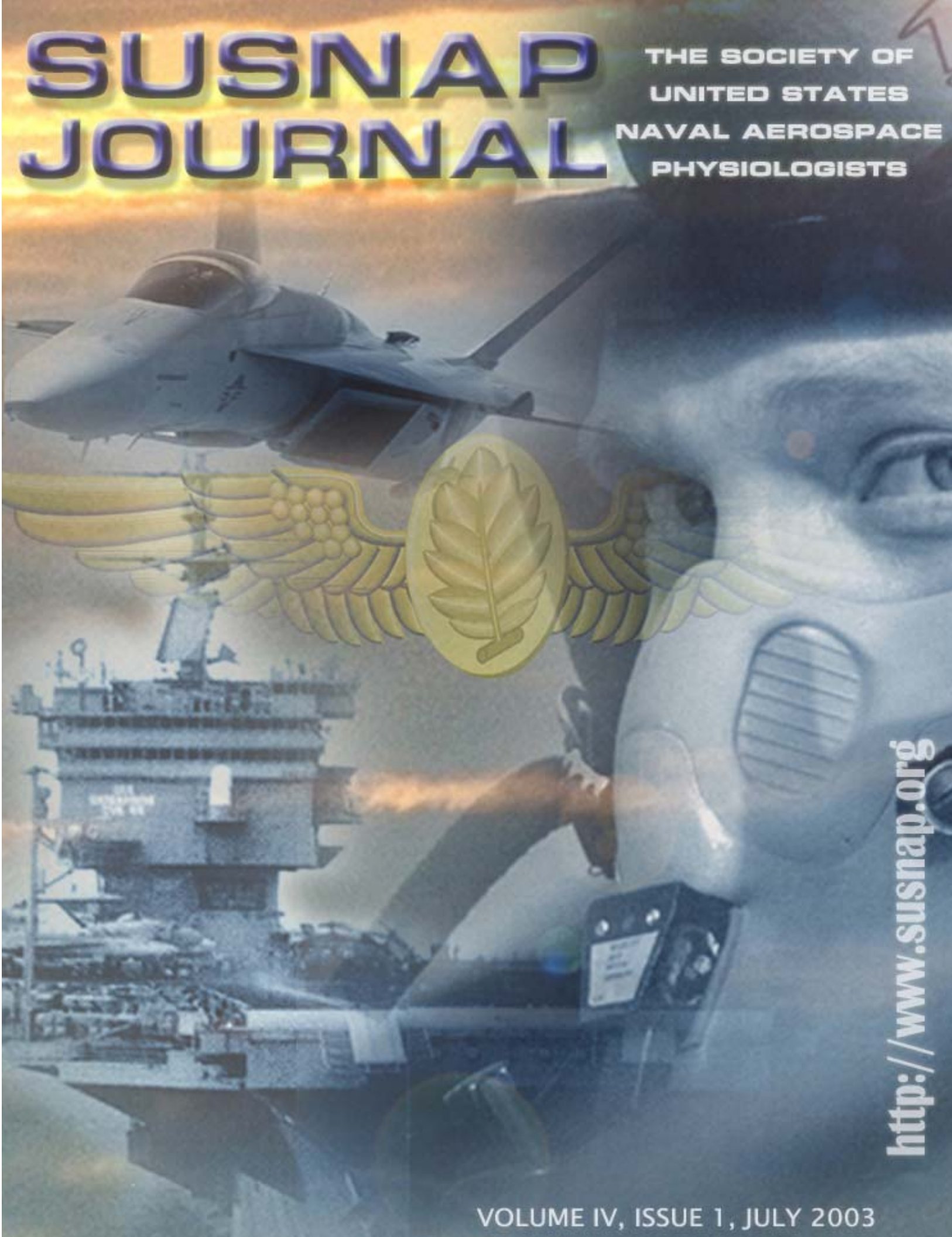
SUSNAP JOURNAL

THE SOCIETY OF UNITED STATES NAVAL AEROSPACE PHYSIOLOGISTS



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VOLUME IV, ISSUE 1, JULY 2003

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President's Corner

by

CAPT. Donna Murdoch, MSC, USN

As we focus our energy toward enhancing the safety, survivability and performance of our aircrew in many diverse environments let us not forget those mentors and pioneers that brought us to where we are today. My goal for this year is to strive for the future while recognizing the past. As we look toward the future, recent world events such as the deployment of our aircrews and friends to Operation Iraqi Freedom and the loss of our friends and colleagues aboard the Columbia shuttle remind us of the inherent danger and challenges that our profession presents. These are not unlike the challenges that our mentors conquered in the past while pushing the envelope of human performance in flight. Our Program would not be where it is today celebrating its many successes without the sacrifices of those who have gone before us. It is, also, our responsibility to mentor those who will succeed us. Take some time out of your busy schedules to drop a line to your mentors to say thanks for a job well done. Additionally, take a few more minutes to spend some time with a new physiologist to guide their way. We are strong because we act as a team and support each other.

BZ, on a job well done, to those who deployed in support of Operation Iraqi Freedom. Thanks: Tuna, Sparky, Wood, Bumbles, Shaggy, and LT Higgins. Also, Thanks to our FAILSAFE Teams who deployed. A special thanks goes out to those who stayed behind and answered the call from those deployed for help. Word has gotten to me about the tremendous help everyone was in supplying assistance. The AMSO mafia lives. Our aircrews performed superbly and were safer due to your efforts.

We have undertaken some changes to our journal and recruited an editorial committee to assist LT Lando. The following individuals have agreed to volunteer their time and effort to the success of SUSNAP.

CDR Mitch Dukovich- Research/Science updates
CDR Tom Wheaton- ASTC/NSTI news and curriculum changes
LCDR Mike Prevost- Research/Science articles
LT Corey Little- AMSO/NAVAIR
LT Tony Artino- History
LT Rich Folga- Research/Science
LT Meredith Yeager- MSC professional development/personnel updates.

Thanks again for your help.

Keep pressing and keep them flying safe.

IN MEMORIUM

PR1 (AW) PATRICK SEAN OGILVIE

17 January 1963-26 March 2003

The Survival Training Program recently lost a shipmate and colleague. On March 26, 2003, PR1(AW) Patrick Sean Ogilvie of ASTC Patuxent River passed away unexpectedly.

The incident occurred at the new Aviation Water Survival Training Facility at Pax. The crew was conducting a routine PT swim. After only about one lap, PR1 Ogilvie collapsed. Immediate and heroic efforts by his shipmates failed to revive him. He had no prior history of health problems or disease. Civilian medical examiners determined that the cause of death was heart attack.

The family and ASTC crew held a memorial service honoring Sean, as he preferred to be called, on April 03 at the NAS Patuxent River base chapel.

Sean Ogilvie served as the Aviation Survival Equipmentman at ASTC Patuxent River since November 22, 1999. He was the LPO for the ALSS shop and served as an Instructor. He was a highly qualified ALSS instructor and taught all other aspects of the Physiology and Water Survival curriculum.

PR1(AW) Ogilvie originally hailed from California. He was born on 17 January 1963, in Vallejo Solano, CA, as the youngest of six children. Shortly after graduating from Andrew Hill High School in San Jose, CA, he enlisted in the United States Navy.

PR1(AW) Ogilvie entered the Navy at Great Lakes Recruit Training Command, IL in February 1986. He reported to Millington, TN for Aviation Survival Equipmentman (PR) "A" School prior to his first permanent duty station at HSL-31.He enjoyed consecutive tours of duty to NSF Diego Garcia, FITRON-33, NAS Patuxent River, and served during the Persian Gulf War aboard the USS Abraham Lincoln (CVN-71).

PR1(AW) Oglivie's personal awards and decorations include the Navy Achievment Medal (two awards), Kuwait Liberation Medal, Southwest Asia Service Medal, the Armed Forces Expeditionary Medal, the Armed Forces Service Medal, the National Defense Medal (two awards) and the Good Conduct Medal (five awards).

Sean was a dedicated, community service volunteer who personally supported his local schools, church, community charitable events and the Christmas-in-April Program. He was known by shipmates for an ebullient spirit and his many, varied and often fun interests. He taught himself the play bagpipes. His other hobbies include wood working, swimming, bicycling, cross-stitch and Canasta.

He was married December 01, 1984, and is survived by his wife, Joella and two children, Julianne and Arthur.

PR1(AW) Patrick Sean Oglivie was one of us. Our Program lost a great Sailor. We shall miss his presence on our deck and in our lives. We honor his spirit, patriotism and dedication to the Navy. God Bless all who give their lives in defense of the Constitution.

W-I-D-E-R Is Better ?

by

LT Rich Folga, MSC, USNR

Wide Field of View (WFOV) Night Vision Goggle Update

Joint Helmet Mounted Cueing System Night Vision Integration and WFOV

Quad Eye Safety of Flight Evaluation Overview
Fixed-Wing Qualitative Evaluation
Fixed-Wing Results
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Naval Rotary Wing HX-21 Aircraft Test Squadron Evaluation
HX-21 Results

USAF WFOV Efforts

Wide Field of View (WFOV) Night Vision Goggle Update

Current Navy and Marine Corps Aviation Night Vision technology has reached a standardized level with the Omnibus IV, third generation AN/AVS-9. Improved manufacturing capability and technological advances in the design of image intensification tubes has led us here, and further capabilities are being explored and exploited across the services. One potential leap in capability is wide field of view (WFOV) image intensification. While Forward Looking Infrared (FLIR) systems allow us to see where NVGs cannot, they have a very narrow field of view that decreases with magnification. Both the current NVG and FLIR systems in our aircraft have the common disadvantage of a limited FOV.

Figure 1

This article was intended to be an update of ongoing efforts to evaluate the utility of adding WFOV image intensification into our cockpits. The information contained in this report is

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Joint Helmet Mounted Cueing System Night Vision Integration and WFOV

The Joint Helmet Mounted Cueing System (JHMCS) **(see figure 1)** needs an integrated night vision capability to complete the program. JHMCS is currently a day-only system with limited night capability. The goal is to get a night vision device that can
accept and display the JHCMS information, and matches the helmet tracker cueing requirements. This will allow users to have both night vision and symbology/weapons cueing capability at the same time. When are we likely to see this happen? China Lake is currently modifying an F/A-18 for a WFOV NVG/JHMCS demonstration flight this fall**.** Ejection, windblast, weight and CG testing will be done at Patuxent River late this summer. In short, we may see a flight demo before the end of the calendar year. The JHMCS night vision integration project is the primary driver behind the NAVAIR WFOV effort.

So which system will be selected to complete the JHMCS Program? Naturally, since the USAF is well into test and evaluation with the Integrated Panoramic Night Vision Goggle (IPNVG) and the JHMCS is "Joint" then it must be IPNVG, right? Actually, the Kollsman "Quad Eye" is the model NAVAIR is presently evaluating. NAVAIR contracted Vision Systems International (VSI), the manufacturer of JHMCS, to develop a night vision interface with JHMCS, and VSI has chosen to work with Kollsman, the developer of the Quad Eye. The Navy has not contracted with VSI to develop a night vision goggle, only an NVG/JHMCS interface.

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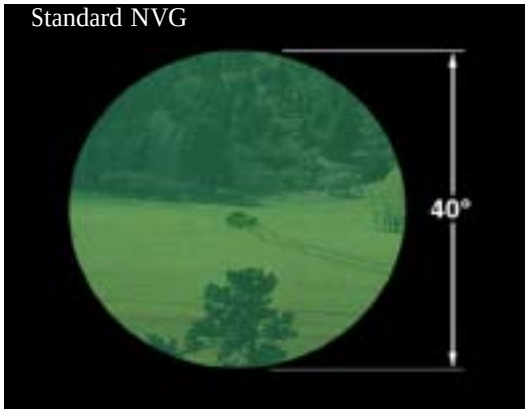
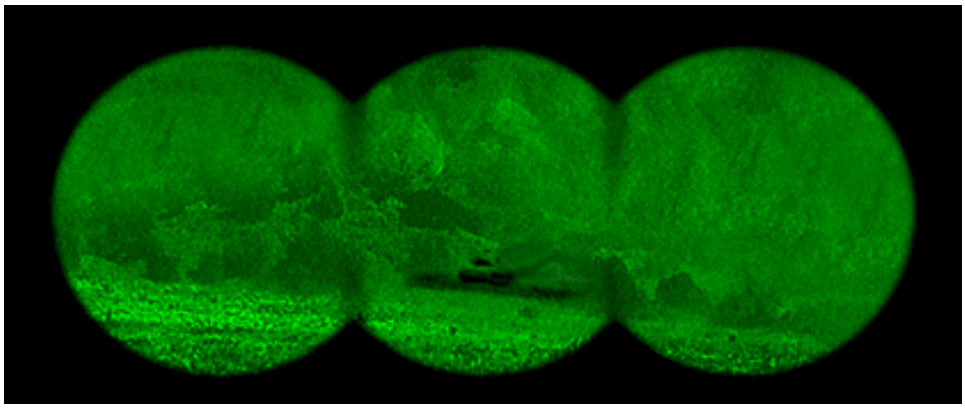
However, VSI needed a goggle to develop the interface and chose Quad Eye. NAVAIR is working with VSI in an effort to demo the JHMCS Night Vision capability in an F/A-18 aircraft. The basic Quad Eye design supports up to two flat panel displays and up to two cameras that modularly attach to the inboard channels. It is currently envisioned that there will be only one display and one camera for the JHMCS version of Quad Eye. The JHMCS symbology and cueing information (HUD type information) is optically coupled into the bottom of one inboard channel of the Quad Eye, while the camera is coupled into the top of the same channel. In this way the camera can see both the intensified night scene and the symbology from the display. The camera image is then fed down the cable to a VTR or VCR where the mission is recorded from the perspective of what the pilot is viewing, including both night vision and cueing information. In essence, the Quad Eye is designed to integrate seamlessly into JHMCS and it is designed to maintain most, if not all of the accuracy of the day system.



Additionally, it is possible that the Quad Eye can be moved through an abbreviated EMD DT/OT phase and ready for fleet introduction in two years, given sufficient funding. Given that scenario, it appears that the fastest path to a JHMCS Night Vision solution could be through the integration of the Quad Eye. Asides from the possibility of quickly integrating the Quad Eye, why not use IPNVG?



IPNVG has two characteristics that are of concern. IPNVG has small objective lenses that limit the amount of energy that gets into the image intensification system. Either IPNVG has to have higher performing tubes than the OMNI IV, AN/AVS-9 or they will end up with degraded low light level performance. The other issue is parallax between the outboard and inboard channels. Since each outboard channel must overlap with its respective inboard channel in order to provide a continuous image, any object that is not at infinity could be lost in the overlap region. For example, if a telephone pole is seen in the outboard channel and the NVG is scanned towards the pole to bring it into the inner channel, there is a potential for it to disappear as the image of the pole transitions between the two channels. The closer the pole is to the viewer, the bigger this effect becomes. Quad Eye has an optical fold to reduce the parallax between the outboard and inboard channels. This optical fold is one of the key engineering tradeoffs as it was done to both reduce parallax and to keep the goggle from becoming too wide. However, the tradeoff is that the Quad Eye outboard channels require more optical elements and therefore more losses (resolution and luminance) than the inboard channels. IPNVG avoids those losses at the expense of parallax and width of the goggle. Another difference between the IPNVG and the Quad Eye is that the IPNVG can accept displays in the outboard channels. .

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The JHMCS/Quad Eye displays will be in the inboard channels only, so IPNVG is more flexible in this respect.

One additional advantage of the Quad Eye is that it has plug and play capability with the ANVIS HUDs on most of our rotary wing aircraft. Having a common application is key to affordability. However, with all that being said, NAVAIR is not pushing one design over the other.

Quad Eye Safety of Flight Evaluation Overview

The purpose of the initial flight evaluation was to determine safety of flight issues prior to conducting flight demonstrations with the Quad Eye at Patuxent River in Navy H-53 aircraft. Two flights, one fixed-wing and one rotary-wing, were conducted during March 2003 at the National Test Pilot School (NTPS) in Mojave, CA during varied periods of ambient illumination. The aircraft used included a Beachcraft Duchess (B-76) and an OH-58 helicopter. The evaluation was coordinated and approved with the appropriate personnel at NAWCAD and NTPS. A Flight Safety Review Board was conducted at NTPS to assess the purpose, route and areas of risk.

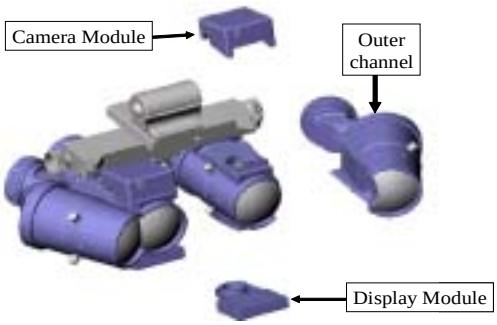
The WFOV system: the four-channel Quad Eye unit has a similar weight (slightly heavier) and CG as the AN/AVS-9, with the addition of a 90+ horizontal FOV, mission camera module and symbology overlay on the inner right channel tube. Each of the four channels has adjustable objective focus lenses. The eyepiece lenses have a fixed –0.5 diopter setting. There is a weight savings associated with the fixed diopter and with the smaller 16 mm image intensifier components the Quad Eye design has achieved a good tradeoff between weight and functionality. Mechanical adjustability mirrors that of the AN/AVS-9. The symbology, mission camera, and monocular modules are removable, hence the term "modules."

Fixed-Wing Qualitative Evaluation

The helmet configuration (SPH-4) with the old style battery pack provided for reasonable center of gravity (CG) and stability. Even when in turbulence it was not necessary to reposition the helmet, and neck fatigue post flight (1.7 hours wearing the Quad Eye) seemed no different than with other binocular NVG systems. Look under for viewing the instrument panel was adequate. However, looking around (to the side of) the Quad Eye to view details inside the aircraft (e.g., crewmember actions, etc.) was difficult due to the presence of the outer channels.

For the fixed-wing evaluation, a symbology generator system was positioned in the backseat of the aircraft and provided HUD information to the right center channel of the Quad Eye. Real-time aircraft generated flight information was not provided to the Quad Eye. A hand-held GPS system provided real-time location, heading and altitude, which were displayed on the right center channel.

The route chosen allowed the pilots to view varied terrain and cultural objects while staying relatively clear of traffic. The combination of takeoff time (in relation to moonrise) and route selection allowed for a transition from low to high illumination conditions while flying over low contrast terrain. This allowed for an evaluation of NVG performance with the moon at a low angle. The route paralleled the Sierra Nevada range and included desert mountainous terrain, farms and ranches, high-tension lines and pylons, dirt and paved roads with vehicular traffic, and urban environments. The flight altitude varied from 1000 feet AGL to 200 feet AGL. The altitude was kept the same for each point along the route in order to provide for a fair comparison of performance.



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The route was flown four different times under the varying conditions. Only one circuit was conducted with the moon below the horizon, which was accomplished without symbology in order to better assess NVG visual performance. The following test results are excerpts from Dr. Antonio's test report.

Fixed-Wing Results

When seated in the pilot seat and with the Quad Eye in the stowed position, the goggle struck a portion of the aircraft just above the door and became dislodged from the mount. This was likely due to the width of the Quad Eye design. When attempting the align the Quad Eye while wearing the TACAIR helmet (HGU-68/P) with the banana mount, the camera unit located on the upper portion of the inner right channel contacted the bottom of the mount. Because of this, the goggle could not be locked in the operating (down) position until it was lowered sufficiently using the vertical control. Once low enough to lock into position, the image was below the optical axes of the eyes. Attempting to raise the Quad Eye once in the locked position put torque on the inner right channel and resulted in an image that was not correctly overlapped.

- Low illumination image quality was poor, which relates to the lack of detail noted when viewing medium to low contrast terrain features. The term "poor" relates to the usability of the information for estimating height above terrain or for identifying terrain features for navigation purposes, and is not used as a comparison to other NVGs.

- The ability to instantaneously see a greater expanse of the horizon was tremendously useful when maneuvering the aircraft, regardless of the terrain detail. The wide FOV did not seem to reduce the amount of head movement when there was reduced detail in the image. This was a surprise. When image quality was good, as during high ambient illumination conditions, reduction in head motion (i.e., rate of scan) was noted.

- It was difficult to visually determine the best objective focus of the outside channels. A significant amount of rotation in the focus adjustment did not result in a noticeable change in image quality on either side. The outer channels had to be viewed with the proximal eye. Attempting to view the image in an outer channel with both eyes resulted in eyestrain and required an inordinate amount of effort. This could be caused by the difference in distance to the image for each eye, or the fact that the eye furthest from the image is viewing only a portion of the image due to the viewing angle – or a combination of both.

- The shape of the image (three circles) and the interface between the outer channels images and the 100% overlapped central image did not pose a problem once becoming familiar with the imagery. Any difference in the positioning of objects as they moved from one channel to another was not evident at the distances viewed.

- When flying in the general direction of the low-angle moon, having the moon disc in the FOV of an outer channel was very distracting, even if the central channels were far enough away from the light source that gain was unaffected. Other bright light sources could pose a similar problem. Being able to selectively turn the outer channels on and off would eliminate this problem. The halo effects seemed similar to those noted in other filmed (AN/AVS-9) goggles.

Rotary-Wing Qualitative Evaluation

A second evaluation flight with the Quad Eye was conducted specifically to assess the goggle while viewing near objects. The objective was to determine whether objects near the aircraft (e.g., during a hover or when landing) remained easily visible in all channels.

The helmet used was the SPH-4 with a standard visor mount and battery pack. The symbology generator and video recorder used during the fixed wing evaluation were not incorporated for this flight. The aircraft's interior lighting system was NVIIS compatible.

A route was chosen that allowed the evaluator to view varied terrain and cultural objects, and to observe near objects with the aircraft in a hover and during landing.

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Rotary Wing Results

As discussed in the fixed wing results, WFOV was advantageous during all portions of the flight. Peripheral cueing information was especially useful for maintaining situational awareness during low altitude flight, hover, and landing phases.

There was a slight shift in the position of objects in the image as they transited from the left outer channel to the inner channel and vice versa. The same was noted for objects in the right outer channel, but to a less extent. However, in neither case was it deemed to be distracting and was only noticeable during close attention.

The lines separating both outer channels from the inner channels were very narrow and not noticeable unless close attention was paid to that area. Nothing viewed in this setting was small enough to be "hidden" by the line of demarcation. It is the opinion of the evaluator that very small head movements (or aircraft motion) would be enough to unmask any objects small enough to be hidden by this line.

It was noted that head movements when using the Quad Eye did not appear to diminish relative to head movements when using a NVG with the standard 40-degree FOV. This was likely due to the lack of detailed information in the image due to low illumination conditions and the constant search for useful information. In these conditions, the lower resolution in the outer channels was more noticeable

The pilot made an approach and landing while using the Quad Eye. This was accomplished while viewing straight ahead with very little head motion (i.e., very little NVG scan) required. The pilot commented that there was enough peripheral information available to make it unnecessary to scan as much as required with a 40 degree FOV system. The pilot noted that he did not appreciate the full effect of the additional field of view until he replaced the Quad Eye with a goggle that had less FOV.

If the entire WFOV is void of useable information, there may be a tendency to spend more time attempting to interpret the image (relative to the time spent interpreting a 40 degree FOV system under the same conditions) content. This situation could lead to a longer period of time not scanning the flight instruments, assuming there is no flight information displayed in the image. Since failing to properly scan the flight instruments has been implicated in several NVG-related controlled flight into terrain (CFIT) mishaps, this is a concern that needs to be evaluated. It is the evaluator's opinion that this is a training issue, and will likely result in a change in crew resource management (CRM) procedures for some aircraft.

No deficiencies were noted secondary to the areas where the outer and inner channels were joined. As noted in the previous fixed wing evaluation, the added FOV of the Quad Eye provided for increased situational awareness and spatial orientation given the testing area, conditions and flight profiles. Whether the additional viewing area is tactically relevant, reduces physical fatigue and reduces the potential for mishaps will require more in-depth testing.

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However, in the opinion of the evaluator, the potential for enhanced tactical operations is significant. Given the conditions during the test, the best-case future NVG would be one that incorporated WFOV, low halo capability and improved low light resolution.

Upon completion, the Quad Eye unit was returned to NAS Patuxent River for more flight evaluation. Results of the demonstration flights with HX-21 are discussed below.

Naval Rotary Wing HX-21 Aircraft Test Squadron Evaluation

Several low illumination flights with the Quad Eye were conducted in the CH-53E by HX-21 out of NAS Patuxent River in April 2003. The Quad Eye was connected into the existing ANVIS HUD for all flights.

HX-21 Results

The Quad Eye improved the ability of the pilots to perform some low altitude tasks due to WFOV and decreased scanning workload. The panoramic technology was advantageous for SA, but at the cost of visual acuity.

In comparison to the AN/AVS-9, under low illumination conditions there was notably less visual performance, resolution, and contrast with the Quad Eye. All pilots agreed there was a need for better, sharper image from all four tubes. As expected, this was most apparent over low contrast surfaces, where it was difficult to detect drift, rate of descent, and maintain hover altitude without the HUD. The physical size of the Quad Eye actually degraded the ability to see cockpit gages in some instances. As for focusing, some pilots found this difficult to impossible for the outer channels. The current Quad Eye version has a very limited outboard channel objective focus, which only varies in a tight range around optical infinity. Mechanical alignment is critical to achieve overlapping FOV with all channels. This was most likely the cause of the difficulty in adjustment. Pilots commented that the resolution of the Quad Eye appeared to fall somewhere between OMNI III and OMNI IV performance.

Wide FOV was sometimes noted as "not helpful" due to poor outer channel resolution. Scan was more often focused in central FOV to pickup better visible performance cues. However, pilots also stated that the additional FOV adds more peripheral cueing. Pilots and aircrew preferred the AN/AVS-9 over the Quad Eye, stating that superior visual performance outweighed the advantage of WFOV. Overall, HX-21 test pilots agreed the Quad Eye needs better acuity/resolution for higher gain tasks, especially shipboard operations.

USAF WFOV Efforts: PNVG and IPNVG

Clearly the USAF has a jump on the Navy for WFOV NVDs. This year, all USAF MAJCOMs have made WFOV a number one priority. The USAF has its sights on two different WFOV goggles: The PNVG and the IPNVG. What is the difference? Quad Eye is a version of PNVG (rotary wing application) that has the same pivot/position adjustment shelf as the AN/AVS-9 model, and separate four channels with a 38 x 95 degree FOV. The IPNVG is the USAF TACAIR version, which is designed to be ejection safe (IPNVG stays with helmet upon ejection!) and has a large position adjustment shelf. IPNVG left and right inner and outer eyepieces are one curved lens, hence the "integrated" name. Currently, IPNVG is undergoing Operational Utility Evaluation (OUE) with 15 sets delivered to Wright-Patterson AFB. USAF aircraft platforms currently having completed or currently undergoing PNVG/IPNVG testing include A-10, F-16, F-15C & E, HH-60, AC-130, MC-130, MH-53, C-17, and soon C-5 and C-130.

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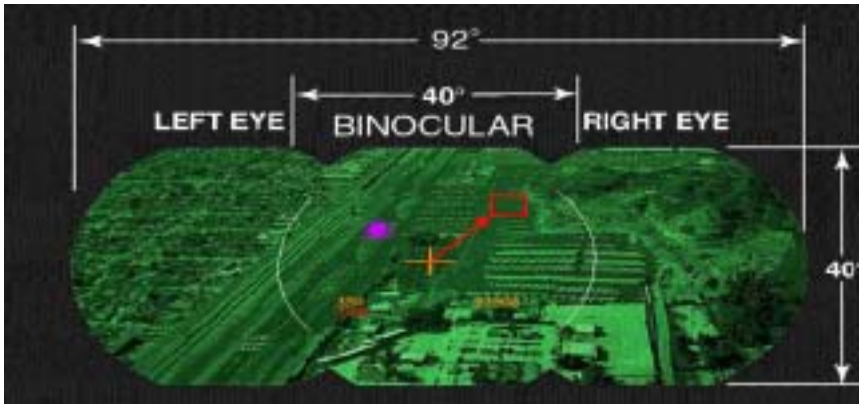
IPNVG operational testing results conducted at the ANG/AFRES Test Center in Tucson, AZ have been largely positive, with a few minor exceptions. In the F-16, air to air post-merge under high G load (>7Gz) there was some difficulty seeing the bogie. This problem rests primarily with the "sweet spot" or eye motion box within the eyepiece. The eyepiece tested was optimized for a stationary 5 mm pupil, the average size of the human eye pupil under night vision conditions. The IPNVG design had limitations outside of 5 mm central viewing area. When properly aligned, there is no apparent problem. When goggle shifts due to G load or vibration, the image becomes blurred. The eyepiece was redesigned, improving lens performance as the eye pupil moves by increasing the "sweet spot" to 7.5 mm diameter. This modification in turn increased the weight of eyepiece. The redesign is being tested to determine if there is a need to further increase the "sweet spot."



In some instances during OUE, pilots found themselves sacrificing turn to try and keep the bogie in the IPNVG FOV. Overall, the impression of the AF test pilots was not to give up visual acuity for FOV. At nearly 90 degrees of bank, the wider FOV is defeated since the goggle still only has a vertical FOV of about 40 degrees. For operation testing, clip on diopter/spectacles were available, but most pilots were comfortable with the fixed eyepiece setting. Previous USAF studies have indicated no clear preference for a standard fixed diopter setting by aviators. The addition of a clip-on correction provides flexibility without the added weight of the optics.

Are the PNVG and IPNVG compatible with industry standard test equipment? Yes, Hoffman Engineering has developed adapters for the ANV-20/20 and the ANV-126 so the PNVGs can be used with those devices. Just like standard 40 degree FOV NVGs, WFOV is not a panacea. Certainly, these systems are way too expensive to purchase in bulk any time soon. Both Quad Eye and IPNVG will likely not get below about $50K per goggle even if bought in quantity. It is also likely that a lot of AN/AVS-9s can be purchased for the same price as one Quad Eye or IPNVG in production. However, as demonstrated at this years' Crew Systems OAG, WFOV and improved NVD capabilities remain a priority. Stay tuned for further developments…

MAWTS-1 is anticipating performing a tactical demonstration of a WFOV NVG for USMC rotary wing aircraft during the WTI 1-04 class. For further information regarding NVG training, operational laser threat / safety contact: LT Rich Folga (MAWTS-1 AMSO) DSN: 269-3652, COM: (928) 269-3652 or via email: folgarv@mawts1.usmc.mil. For questions regarding classified aspects of any of the above areas, email folgarv@mawts1.usmc.smil.mil. To learn more about MAWTS-1, and to obtain downloadable versions of WTI courseware and manuals, visit http://www.tecom.usmc.mil/mawts1/. You may download both the MAWTS-1 fixed and rotary wing NVD manuals here as well.

The editor acknowledges Dr. Randy O'Connor and Dr. Chuck Antonio for their continuing contributions to the SUSNAP Journal night vision technology updates.

LT Folga is the AMSO for Marine Aviation Weapons and Tactics Squadron One

Why Are My Fingertips Blue?

Improved Hypoxia Training For Jet Refreshers

by

HM1 Stephanie O'Brien
&
LT Anthony Artino

AUTHOR'S NOTE: This article is scheduled to appear in a Fall issue of Approach Magazine, and as such, is written for a specific audience — our fleet customers. That being said, it does give a general overview of where our hypoxia training is today, as well as where it may be headed in the future, and therefore might also be of interest to the general SUSNAP membership. For those more interested in the physiology and "science" behind ROBD, a more detailed article is schedule to appear in the next issue of the SUSNAP Journal

The Hypoxia Threat

If you've been following message traffic lately, you probably know about the rash of hypoxia incidents that have occurred over the last two years. These incidents, occurring primarily in OBOGS-equipped aircraft, reaffirm what we've known for many years – flying at altitude is hazardous business. The excerpts below illustrate this point:

F/A-18D, MAR 2001
A Hornet from VMFA-224 was at 30K feet during an air intercept mission. The pilot felt what he believed to be hypoxia or decompression sickness. He pulled his green apple and initiated an immediate descent. The WSO did not feel any symptoms but activated his emergency oxygen too. The aircraft made an uneventful landing.

F/A-18C, MAY 2001
A Hornet from VFA-106 was on a high altitude ferry flight when it descended from 42K feet and impacted the ground. No ejection was initiated. Investigators determined the most plausible explanation was pilot hypoxia. The incident appeared to be caused by a bleed air leak in the common bleed air ducting resulting in a total bleed air shutdown, subsequent loss of OBOGS, and loss of cabin pressurization. Those conditions, coupled with delay in selecting emergency oxygen and delay in descending, led to pilot incapacitation.

F/A-18F, FEB 2003
A Hornet from VFA-122 was dash two of a section on a cross-country training mission. The pilot experienced an OBOGS degrade light and was advised by lead to turn around and descend below 25K feet. Minutes later, the pilot experience severe hypoxia, including an inability to focus, an inability to hear and respond to radio calls, an inability to coordinate his thoughts or perform simple tasks, and muscle twitching which made it difficult for him to manipulate the stick and throttles. Following instructions from his RWSO, the pilot activated his emergency oxygen and regained some basic motor skills, recovering the aircraft after passing 6-7K MSL. The aircraft made an uneventful landing.

F-14D, FEB 2002
A Tomcat-D from VF-101 was climbing out on a ferry flight from Oceana to Key West. Prior to reaching his assigned altitude of FL280, the pilot became incapacitated. The RIO suspected hypoxia and returned his mask to his face. After exceeding 30K feet, the RIO talked the pilot through a dive recovery at 14K feet. Neither pilot nor RIO activated their emergency oxygen. The aircraft made an uneventful landing.

"What are we in Naval Aviation doing to prepare aviators for these types of incidents?"

Current Hypoxia Training

A quick review of these incidents brings to mind the following question – "What are we in Naval Aviation doing to prepare aviators for these types of incidents?" For more than 50 years, Aerospace Physiologists and Aerospace Physiology Technicians have been providing hypoxia training to Navy and Marine Corps pilots, flight officers, and aircrew in the form of low pressure chamber training. This training, which hasn't changed significantly in almost half a century, consists of initial and refresher students listening to physiology lectures and then "riding" a large steel box to a simulated altitude of 25K feet. While at 25K feet, students remove their oxygen masks for a maximum of four minutes while they play patty-cake, do puzzles, worksheets, or use some other activity to help them experience and recognize the signs and symptoms of hypoxia.

Although effective, hypoxia training in an altitude chamber does have its drawbacks and limitations. First, during hypoxia training in the altitude chamber, refresher students do not perform

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Figure 1

activities in the context of their working environment – the aircraft. Second, jet students experiencing hypoxia in an altitude chamber do so with their masks off, a fact that may render the training a bit unrealistic in the face of the many recent OBOGS incidents (most of which occurred with oxygen masks in place). Some in the training world might even consider this to be "negative training." Finally, there are numerous medical risks associated with altitude chamber training; these include decompression sickness (DCS) and barotraumas (ear blocks, sinus blocks, etc.), which can result in the grounding of an aviator for days, weeks, or even, in extreme cases, months.

Improved Hypoxia Training

The use of a Reduced Oxygen Breathing Device (ROBD) (figure 1) in combination with actual flight duties may be a more effective training syllabus for jet refresher students. The ROBD is a portable device that simulates the rarified atmosphere present at altitude by diluting the inspired oxygen with nitrogen under sea level conditions. The device, which delivers the oxygen/nitrogen gas mixture through a standard oxygen mask, can produce sea level equivalent oxygen concentrations that simulate altitudes from 0 to 40,000 feet. The advantages of ROBD are numerous, and include: a) the ability to accurately and reliably induce hypoxia in students with no risk of DCS or barotraumas; b) the ability to operate the device almost anywhere, including inside a fleet simulator; c) the ability to induce hypoxia in students while wearing an oxygen mask and while performing actual in-flight duties; and d) the ability to tie together three important aspects present in almost all of the recent in-flight hypoxia incidents – the need to recognize aircraft warnings for an oxygen systems failure; the need to recognize the signs and symptoms of hypoxia; and the need to execute the proper aircraft-specific emergency procedures to counter the threat.

The use of a ROBD (Figure 2) to train for hypoxia is just one part of a larger shift in the traditional physiology and water survival training paradigm. This new school of thought, called scenario-based training, says that simply lecturing about physiological threats is not enough. Instead, it is important for pilots and flight officers to experience things like spatial disorientation, visual problems, and hypoxia *in the context of their working environment.* And not only should they experience these problems, but they should also practice applying effective countermeasures to deal with these threats. This type of scenario-based training, or simulator physiology (a.k.a. SIMPHYS), has already been tested in the Marine Corps' AH-1W simulator, and the response from the fleet was outstanding.

Figure 2

Although the ROBD promises to be an improvement over the existing training regimen, it does have its limitations. To start with, it does not produce pressure changes

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NSTI

Preparing First Ever Computer-Based Physiology Training

by

LCDR(ret) Brian D. Swan

In the ongoing attempts to move the Naval Aviation Survival Training Program (NASTP) into the 21st Century, NSTI is in the process of developing Web-Based Training (WBT) modules for some of the NASTP refresher training courses. Designed to be part of a modular concept of training, the WBT modules will interlock with ASTC-based training, the Reduced Oxygen Breathing Device (ROBD), and simulator-based physiology training (SimPhys).

The R1/RP1 (Jet Refresher) curriculum has been selected for trial in a pilot program to evaluate the proof of concept. The Overview, Aviation Physiology, Stress, and Sensory Physiology Briefs are slated for computer conversion. The basic concept is that a student will contact the ASTC for a training quota and will be offered the WBT option. If the student wants it, they will be given a web address and password, and will then be on their own to complete the WBT prior to their scheduled completion date at the ASTC.

Once logged into the course, the student will be instructed to print out the course objectives, and will then be able to navigate through the many short lessons in any order that they wish, reviewing sections as many times as they wish, or skipping some altogether. Review quizzes are available for each module. When they feel as though they can meet all of the course objectives, they will select the Exam from a menu, and take the final test for the WBT on-line. If they pass the test, they will be able to print a completion certificate. If they do not pass, they will have the option to re-take the exam (which is randomly built, "on the fly" from a test pool). In either case, their scores will be automatically sent to a database that is accessible to the ASTC at which they will complete their training.

Upon reporting to the ASTC, the student will have different choices (depending on facilities and availability) of what dynamic training they receive (ROBD/SimPhys, ROBD at the ASTC, or a traditional LPC flight). Prior to the dynamic training, a physiologist will meet with the student, ask if there are any questions, and review any current mishaps that are applicable to the training. ALSS, First Aid, and Water Survival training would then progress traditionally.

This is a joint development effort between the Director of Safety and Standardization (DOSS) and the Director of Human Performance and Training Technology (HPTT). The content is being primarily authored/programmed by Mr. Brian Swan of Jardon and Howard Technologies, Inc., the NSTI Instructional Designer. (For you geeks out there, the entire course is being built in Macromedia's Flash MX, contained in a dynamic HTML shell, and will consist of over 100 interlinked SWF files). The pictures accompanying this article are all screen captures from the presentation. The actual presentation makes extensive use of interaction and animation as methods of retention and maintaining interest. Web hosting and server interface issues are still being worked out, although, for the sake of the initial pilot course, a NOMI server will probably be used. Ultimately, integration with the Navy E-Learning system is anticipated.

When will this be available? That's hard to say. A project of this size is quite complex, and when the WBT development "team" is one person – who has

other ID responsibilities at NSTI – it takes some time. The current goal is to have the courseware complete by the next FAILSAFE meeting (Feb 2004) for presentation/demonstration to the community as a whole. In the interim, some portions may be made available on the web for preview purposes. At this time it is unknown what server issues may arise, or how long it may take to resolve them. The hope is, that by the Spring of 2004, the pilot course will be ready to be launched (which is also when, if all goes well, the ROBD will be ready for use).

As is always the case with major changes to a long-established training protocol, there will be questions, concerns, unforeseen logistical problems, etc. Although this concept has been "in the works" at NSTI Headquarters for several months, this is the first "public announcement" of the new modular concept. Please continue reading this journal for updates and developments as the project becomes more refined. In the interim, feel free to contact LCDR Mike "Chow" Prevost, LT Tony "Ragu" Artino, or Mr. Brian "Trout" Swan if you have any questions.

LCDR Swan (ret) is NSTI's Instructional Designer

Get to Know:

LCDR Sue Jay

Lieutenant Commander Sue Jay was born in Waterloo, Iowa and graduated from Columbus High School. She earned a BS in Exercise Science from the University of Iowa in 1987, and a MS in Physical Education from the University of South Carolina in 1989. She completed her Ph.D. in Kinesiology, with emphases in neuromuscular physiology and statistics/research design, from the University of Texas at Austin in 1995.

Sue worked as an Adjunct Professor/Research Associate at the University of Texas at Austin until she entered the Navy as a Lieutenant in September 1997, and after completing Officer Indoctrination School she started Aerospace Physiologist training in Pensacola, Florida. She transferred to the Radiation Health Officer community in January 1998.

After completing Radiation Health Officer School in Groton, Connecticut, she reported to the USS FRANK CABLE as the Radiation Health Officer/Medical Division Officer from April 1998 to June 2000. In August 2000 she reported to the Naval Medical Clinic, Pearl Harbor as a Radiation Health Officer. In October 2000 she also assumed the duties of the Assistant Clinic Director, Branch Medical Clinic, Pearl Harbor Naval Shipyard. In July 2002, she returned to the Aerospace Physiology community, completed the curriculum, and was designated Naval Aerospace Physiologist #267 in January 2003. She is currently assigned as the Assistant Department Head/Administration Officer, Aviation Physiology Training Department, Naval Survival Training Institute in Pensacola, FL.

Sue's hobbies and interests include competing in triathlons, golf, and hiking.

Low Carbohydrate Diets: **An asset or liability?**

by

LCDR Simon Bartlett, MSC, USN

You don't know what you are talking about, said the young Lieutenant sitting through my Stress and Human Performance class. He was referring to my counter argument regarding the efficacy of Low carbohydrate diets. Later I found out he was on one, and in my opinion he G-loc'd multiple times in the centrifuge because of it.

Low carbohydrate diets have become popular recently promising a magnitude of benefits from weight loss to increased athletic performance. As the Department Head of the Aviation Survival Center Lemoore and having a strong background in Sport Nutrition and Exercise Physiology, I am frequently sought out by tacair pilots for information in the area of performance enhancement. In particular, I am privy to many of their personal goals, concerns and experiences in the ever-popular arena of nutrition and exercise. Pilots being who they are are constantly looking for the edge and will sometimes resort to various means to get it.

Using my sleuth skills I tried to figure out what was causing it.

Here's an interesting story. About a year ago while sitting behind my desk at the unit, the phone rang. Answering it, I recognized the voice of a CDR who had recently been through centrifuge training on the other end. After dispensing with the usual pleasantries he came to the point and asked me if I remembered him from his CFET training. I recalled when he attended and that he had done well with the profiles, some at 7.5 G 's.

The CDR's concerned voice told me that something wasn't right in Hornetsville and that he was about to let me in on something important. I was right! He went on to tell me that he was having some significant graying and even blackout problems at relatively low G's in his aircraft. It had been going on for approximately 6 weeks, and he was at a complete loss as to why it was occurring. Using my sleuth skills I tried to figure out what was causing it. I launched into some questions, how's your flight time? He said," I 'm getting above normal amounts". I asked about hydration, he said, "drinking plenty of fluids". I asked about his exercise and sleeping habits, he said, "everything is normal". I was stumped; then it struck me, illness, had he been ill during this period of time? Again he said "no". At this point I felt I had exhausted all possibilities and recommended that he come back to the centrifuge so we could evaluate his technique and possibly discern what the problem might be. As I was about to hang up the phone with him, the CDR made a very important revelation and said "I don't know how significant this is, but I have been on the Atkin's diet for the last 6 weeks". Bingo! I found the cause.

The Atkin's diet is designed to be a rapid weight loss diet it is not and should not be used as a performance enhancement diet. The CDR had lost 15 pounds over 6 weeks while he was on it. In fact, he was still on it at the time of the call.

As most people know by now, these types of diets are designed to be low carbohydrate high protein and fat methods for helping people lose significant amounts of weight over short periods of time. The mechanism is not rocket science either. Very low carbohydrate intakes over an extended period of time result in the body going into a mild state of ketosis. Ketosis is when the body breaks down stored fats incompletely into ketone bodies, which are then released into the circulation. Increased circulating ketones have a profound appetite suppressing effect and coupled with high protein consumption (proteins have the highest satiety value of all macronutrients) result in a substantially reduced caloric intake and hence weight loss.

Analyzing the type of weight lost, research has shown that it is a combination of water, lean body mass, glycogen as well as fat. For a tactical aviator, the goal should be to not lose anything other than fat. The loss of muscle, water and glycogen runs contrary to what is needed in the high G environment. For a pilot that is engaged in a resistance (strength) training program and pulls high sustained G's on a regular basis needs the right type

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and amount of fuel that will drive the energy mechanism for sustaining the maximum muscle contractions needed under G. The optimum fuel to accomplish this physical challenge is carbohydrate. G pulling uses glucose and glycogen exclusively to fuel the muscles required in the isometric contractions needed to prevent the blood from pooling in the lower extremities.

It is not difficult to understand how a low carbohydrate diet would be inappropriate for a pilot in this environment and could potentially become a liability to them rather than an asset. In fact, I have witnessed first hand pilots that have G- loc'd in the centrifuge under moderate G's who have admitted to being on one of these diets.

In order for ORM to be practiced in every possible scenario, I feel these diets need to be evaluated carefully and with some skepticism by pilots before strapping into their aircraft-mitigate all potential risks.

To back up my point, I always turn to the scientific literature. The literature is controlled clinical research that has been peer reviewed and published in legitimate scientific journals to highlight the latest developments in the field of nutrition and human performance enhancement. The available scientific research at this time clearly indicates that the majority of low carbohydrate diets are potentially ergolytic (performance decreasing) to both endurance and high intensity exercise Therefore, a low carbohydrate diet coupled with intense training protocols (strength training and G-pulling) result in a significant suppression of muscle glycogen with a corresponding decrease in isometric strength, time to fatigue and exercise-induced muscle weakness. Remember carbohydrates are needed to replenish the muscle glycogen not the proteins and fats. Perhaps a new NATOPS 3710 rule should be: WARNING, low carbohydrate diets could be potentially dangerous to tactical aviators performing high G maneuvers.

Another very important point that needs to be made regarding low carbohydrate diets is the effect they may have on the brain and eyes. Every Physiologist knows that the eyes and brain operate primarily off circulating glucose. Low carbohydrate diets have the potential to reduce blood glucose to to theses vital organs, which begs the question, "what happens to vision and cognitive capacity as a result of being on one of these diets?" I think the answer is self-explanatory.

Honestly, I think education is the key. Keeping pilots abreast of the latest research, providing them resources and helping them debunk much of the unregulated, misleading information will certainly go a long way to empowering them to make informed decisions based upon science and not hearsay. The goal is to keep them fit and healthy to fly-essentially giving them the edge.

Oh by the way, the CDR took my recommendation and got off the low carbohydrate diet. He introduced significant amounts of carbohydrates back into his regular meals and guess what? The problem went away.

LCDR Bartlett is the Department Head for the Aviation Survival Training Center Lemoore.

Ultrarunning

Testing the limits of physical and mental endourance

by

LT Tim Loomis

I ran my first road race at age 12, but I didn't really consider myself a "runner" until, at age 16, I ran and finished the Wineglass Marathon (Corning, NY). Now after 19 years of being a "runner" I'm starting to think of myself as something different – an "ultrarunner".

What is an "ultrarunner" you ask? According to **David Blaikie's web site Ultramarathon World (http://www.ultramarathonworld.com),** an ultramarathon is any running event longer than the standard marathon distance of 42.195 kilometers (26 miles, 385 yards). So an ultrarunner is someone who runs ultramarathons.

Ultramarathons come in many varieties. There are road ultras of distances from 50K (31.1 miles) up to the monstrous 3100-mile Sri Chinmoy that is held

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each summer circling around a few city blocks in New York City. There are also races to see how much distance can be covered in a certain amount of time, such as 6-, 12-, 24-, and 48-hour races. These are most often run on quarter-mile tracks (can you say boring?), but a few "brave" souls have even done 24-hrs on a treadmill! Finally, there are trail ultras, which have become my latest hobby.

Like the road ultras, trail ultras come in a variety of distances, but the most common are 50K, 50-mile, 100K, and 100-mile races. What really sets a trail race apart from the road race is the terrain over which the race is run. The most popular is single-track trail, which is basically just a dirt path that is wide enough for one person and often is covered with roots, rocks, logs, stream crossings, and has the potential for run-ins with the local wildlife. Some of the less desirable flora and fauna are poison ivy, poison oak, ticks, yellow jackets, rattlesnakes, bears, and even mountain lions. Most trail ultras also incorporate stretches of dirt road, or even paved road, but most hard-core trail runners think the fewer roads, the better.

The other big difference between road and trail ultras is the amount of elevation change from start to finish. Most of the trails wind themselves over ridges and plunge into steep valleys or canyons. It is not uncommon for a 100-mile trail ultra to have 20,000 ft of gross elevation gain and loss from start to finish. One of the most extreme is the Hardrock 100 (Silverton, CO), which has 33,008 ft of elevation gain and loss. If that isn't bad enough, 80 miles of the race is run at elevations higher than 10,000 ft, and the highest point is 14,048 ft. Can anyone say hypoxia!

About now you may be thinking, "How can anybody run that far over that kind of terrain?" The answer is it's not possible to run the whole distance. Walking long sections of the course, especially the uphills, is not only the smart thing to do; it is required to properly manage energy usage throughout the long distance. The body has a limited amount of carbohydrate (glycogen) stored in the muscles and the liver (about 1500-2000 kcal of energy). When carbohydrate stores are depleted, almost all energy must come from fat metabolism (a slower metabolic process), and the athlete experiences severe fatigue. This sensation has been called "hitting the wall" by marathon runners, or "bonking" by other athletes, and occurs after approximately 20 miles of running. Since ultrarunners go 11, 30, or 80 miles beyond the "wall" in 50K, 50-mile, and 100-mile races, respectively, it is imperative that they develop an effective plan for carbohydrate replacement and energy management.

Carbohydrate replacement during exercise becomes a balancing game. Ingestion of too much carbohydrate at one time and the G-I tract, whose blood supply is being shunted to working muscles, will revolt violently with vomiting or diarrhea. Too little carbohydrate and the athlete will "bonk". Too assist the ultrarunner in this game of carbohydrate replenishment aid stations are located every 3-8 miles and are stocked with sports beverages, sodas, fruit, candy, boiled potatoes, soups, etc. The ultrarunner can take as little or as much of the food as they need to help meet their incredible caloric expenditure (at least 100 kcals/mile = a minimum 10,000 kcal need for a 100-mile race).

Even more important than carbohydrate replenishment, rehydration is of paramount importance to the successful completion of an ultramarathon. As we all know, dehydration significantly impacts physical performance, and excessive dehydration can lead to severe heat injury and death. Ultrarunners follow the principle of "drink early, drink often", and are often required to carry a water bottle or camelback on the trail. In most 100-mile trail races, medical checkpoints are found along the course. The ultrarunner weighs in prior to the race, and is weighed again at each of these checkpoints to determine body weight loss due

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to dehydration. The rules regarding dehydration at the Western States 100-mile race (Squaw Valley, CA to Auburn, CA) are as follows:

A loss of 3% of body weight will affect one's performance. In most cases the runner will be allowed to proceed, with fluids encouraged. A loss of 3 to 5% of body weight indicates significant depletion of body fluids, with possible loss of gastrointestinal and musculoskeletal function. After evaluation, the runner may be allowed to proceed at a slower rate, drinking more fluids. A loss of 5 to 7% of body weight will require a more extensive evaluation, and the runner will be required to stop and rehydrate back to the 3-5% weight loss range before proceeding. A 7% loss of weight may be grounds for withdrawal from the Run due to the increasing risk of dangerous impairment of body functions.

Using only water as fluid replacement is not sufficient and can lead to severe medical complications. Sodium loss from sweat in an acclimatized runner is approximately 1.5-2.0 grams per hour, and can be much higher if the runner is experiencing vomiting or diarrhea. The loss of this important electrolyte can lead to headache, muscle cramps, weakness, disorientation, apathy, and lethargy. If the ultrarunner ingests excessive amounts of water without adequate sodium replacement hyponatremia may result. Although rare, hyponatremia has been seen in ultrarunners, and can lead to renal failure, coma, and death.

Other forms of aid for ultrarunners come in the form of support personnel. "Crews" and "pacers" are things that are unique to ultrarunning, and are not found in races that are marathon distance and shorter. A crew is one or more people that meet the runner at specific aid stations and provide the ultrarunner with things like a change of clothing, a change of shoes, unique nutritional items not found at the aid stations, and just about anything else that the runner may want and the crew can provide. The crew is prohibited from meeting the runner at any place other than the designated aid stations, and they can't physically assist the runner in any way.

A pacer, on the other hand, is someone who is not entered in the race but runs with the ultrarunner along certain parts of the course. Since it may take an ultrarunner up to 36 hours to complete a 100-mile trail race, the ultrarunner will have to run on the trail during the darkness of night. This is potentially dangerous for a fatigued, sleep-deprived ultrarunner, so a pacer can accompany the ultrarunner for safety purposes. Pacers are also prohibited from physically aiding the ultrarunner in any way, including carrying any of the ultrarunner's gear (called "muling"), but the emotional support from the pacer can be the difference between a successful finish and a DNF (did not finish).

Now that you know what an ultrarunner is, the question becomes how did I become interested in such a crazy sport? It all started about one year ago when my youngest brother, Greg, told me he had entered the Western States 100-miler, and wanted to

know if I would help his fiancée crew his run. Greg has become one of the top trail ultrarunners in the country over the past few years (his 16:28:12 at the Rocky Racoon 100-mile was the 13th fastest 100-mile time in North America in 2002), but I had never been to one of his ultras. So I told him that not only would I help with the crewing duties, I would run as his pacer for the last 22 miles of the race.

Even though I had run thousands of miles during my running career, I really had no idea what to expect when it would be time to run with my brother. I knew there would be some walking, I knew it would be on rugged trail, and I knew all of the running I would do with him would be at night and lit by the flashlights we would carry with us.

Over the next few weekends I ran on the trails in Sequoia National Park to familiarize myself with trail running, and to get myself into some kind of

Continued on next page

of running shape. I had become "burned out" with road running, and had let myself get into pretty bad shape for someone who thinks of himself as a "runner". The trail running seemed to bring back the joy I experience from running, and my training progressed fairly well. When the last weekend of June 2002 arrived, and it was time for that year's version of the Western States 100, I was ready to go.

After spending all day driving from aid station to aid station performing crew duties for Greg, I changed into my running gear and met him at the 78-mile aid station. It was 2130 on Saturday night, and I would run/walk with him until he finished at 0423 on Sunday morning. Running on the trail at night was an incredible experience, and that was when I knew I had to start running ultras as a participant and not just a pacer.

About two weeks after Western States was over I sent in an entry for my first ultramarathon, the Skyline 50K (Castro Valley, CA) on August 3, 2002. Although the distance was only 9 miles further than I had run with my brother a few weeks earlier, the experience was much different. Instead of running at night when it was cool, this was run during the heat of the day. And instead of walking very regularly, I thought I was capable of running the majority of the race. The heat caused me to sweat more, I lost too much sodium, and I experienced severe leg cramping at around 22 miles. The helpful aid station workers added extra salt to the Gatorade I was drinking, and after a few miles of walking the cramping eased up, but I was shot. I ended up walking about 7 of the last 9 miles, but I finished in 6:48:22, more than an hour under the 8-hour time limit for the event.

My experience at the Skyline 50K taught me a lot of things, but it also motivated me to correct my mistakes and see how far I could push my body. During the next 6 months I continued to train, and I became smarter about how to approach an ultra. On April 12, 2003 I ran my first 50-mile race, the Bull Run Run in Clifton, VA. I listened to my body well that day and cruised home to a 10:14:08 finish. I could have run faster, but my goals for that day were to run a very controlled race and to finish. The thing I've learned about running ultras is that it's not about racing against others, or even against the clock, it's about self-discovery.

I plan to continue running ultras and testing my limits. The plan is to run another 50K and 50-miler in the next few months as preparation for the ultimate test – a 100-mile run. My brother, Greg, and I are planning on running the Rio Del Lago 100-miler in Granite Hills, CA on September 13, 2003. The primary goal is to finish; the secondary goal is to break the magical 24-hour mark – 100 miles in one day. Wish me luck!

LT Loomis is the Director of Centrifuge Training at the Aviation Survival Training Center, Lemoore.

Why are my fingertips blue?
Continued from page 13

and gas expansion, like the altitude chamber, a fact that limits its use for training indoctrination personnel. Next, because the ROBD requires the use of an oxygen mask to induce hypoxia, it has limited use for training aircrew who do not wear oxygen masks during normal flight. Because of these reasons, it is unlikely that the altitude chamber will be going away anytime soon. Instead, its use will be augmented by ROBD in places within the physiology training curriculum that make the most sense (i.e. training experienced jet refresher students that wear oxygen masks regularly).

The Road Ahead

The Naval Survival Training Institute (NSTI), the folks who currently provide physiology and water survival training, has recently purchased a ROBD from the Naval Aerospace Medical Research Laboratory, the individuals that designed, developed, and tested the ROBD. NSTI is in the process of developing Standard Operating Procedures to run the ROBD and is also writing a SIMPHYS curriculum that includes the use of ROBD to induce hypoxia in a simulator. A pilot version of this new curriculum is scheduled for release at selected Aviation Survival Training Centers as early as the fall of 2003. So, the next time you go for your quad-annual physiology and water survival training qualification, you may have the opportunity to experience hypoxia while flying in a simulator instead of playing patty-cake in an altitude chamber.

LT Artino and HM1 O'brien are part of the NSTI development team in Pensacola.

ASTC/NSTI Highlights

ASTC Norfolk

NATO Conference

by

LT Nick Dimaso, MSC, USNR

"Survival at Sea for Mariners, Aviators and Personnel Involved in Search and Rescue".

Aviation Survival Training Center Norfolk ,–hosted a two day North Atlantic Treaty Organization Conference on "Survival at Sea for Mariners". The focus was Aviators and personnel involved in Search and Rescue. This program was facilitated by CDR Gail Hathaway, BUMED Specialty Advisor (M3FT), and organized by the NATO Research and Technology Organization (RTO) Human Factors and Medicine Panel. The conference was open to all aviators, aircrew, medical professionals and SAR personnel from all branches of military service, as well as rescuers from the various search and rescue organizations and academic researchers in the civilian community.

This short course addressed the physiology of sudden cold water immersion and non-freezing cold injuries; the design and development of immersion suits, lifejackets, life-rafts, and Total Enclosed Motor Propelled Survival Crafts (TEMPSCs); the physiological basis of sea sickness; the human factors associated with surviving a helicopter ditching; and finally heat stress and its relation to protective clothing. The NATO instructors conducted practical in- water demonstrations of the various lifejackets and helicopter emergency underwater breathing systems in use throughout the world. Instruction on how to test and analyze new life support equipment, specifically lifejackets, was also conducted.

The instructors were reputable researchers and professionals, highly published and experienced in the field of sea survival, led by Dr. Chris Brooks and his Chief Training Manager Mr. Peter Gibbs of Survival Systems Ltd. Canada. The remainder of the team consisted of Dr. Mike Tipton from the University of Portsmouth, UK, Dr. Bob Cheung from Defense Research and Development Canada (DRDC) Toronto formerly Defense and Civil Institute of Environmental Medicine (DCIEM) and Professor John Kozey from Dalhousie University, Canada.

Members of U.S. and foreign military communities attended, including the Canadian Coast Guard, The Royal Navy, the U.S. Naval Aerospace Physiology and Flight Surgeon communities, and local U.S. Navy Search and Rescue assets. In addition to the military personnel present, numerous Firefighters from the City of Newport News, Virginia Fire Department were also present.

LT Dimaso one of our newly designated Naval Aerospace Physiolgist.

ASTC Patuxent River

Aviation Water Survival Training Facility Building Dedication

by

LT Orlando J. Olmo, MSC, USN

The Aviation Survival Training Center at Patuxent River dedicated a new full capability Water Survival Training Facility on 19 May 2003.

RADM Nancy Lescavage NC USN, Commander of the Naval Medical Education and Training Command (NMETC), was the keynote speaker for the building dedication. In her dedication speech RADM Lescavage noted how the new Center will increase ASTC Patuxent River's historical training load of about 400 Aircrew, 600 USNA & ROTC Midshipmen, 250 civilian contractors, 20 Foreign Military, 50 DOD & NASA per year and a large number of VIPs. Senators, Congressmen, Service Secretaries, CNO designees, Admirals and Public Affairs media people routinely train at Pax River. The new AWSTF will nearly double, when new staff and equipment arrive. RADM Heely of NAVAIRSYSCOM addressed the value of the AWSTF from an operator's perspective. He said that many Naval Aviators will survive to fight another day because of this new facility. Also in attendance and speaking were the Commanding Officer,Naval Operational Medicine Institute, Capt Freer, and Capt Eichner, Director of the Naval Survival Training Institute.

Groundbreaking on the new Aviation Water Survival Training Facility (Building 2646) took place on 15 August 2001. The AWSTF was built by Whiting Turner Contracting at an approximate cost of 4.5 million dollars. The 26,000 square foot facility houses a 311,000 gallon pool, with state of the art classrooms, offices and water survival training devices. It is one of the most advanced training facilities of its kind in the U.S. Navy and the world.

ASTC Patuxent River has come a long way since the 1992 move to Building 2165. Patuxent River was a "Physiology Only" training site, with only limited Water Survival Training capability. Pax had no devices and seasonally used the Officer's Club pool to conduct limited Water Survival classes.

Lt O.J. Olmo is the Department Head for ASTC Patuxent River and the new Aviation Water Survival Training Facility. Lt Olmo and his crew will bring the new center to life. New training equipment will soon be delivered. It must be installed and made functional. Training devices must be certified, and the crew trained to operate them. The Pax Instructors will have to develop new local training SOP's to accomodate the new capability the AWSTF offers. The ASTC Patuxent River staff currently consists of LT Olmo, HM1(FMF) Wichman, HM1 Blaesing, HM2 Patee, HM2 Cato, EM2(DV) Cusick, HM3(PJ) Dado, HM3 Ramirez and Mr. J. McWilliams, Mr. Stephen Ray.

ASTC Lemoore

Centrifuge-based Flight Environment Trainer (CFET) Update

by

LT Tim Loomis, MSC, USN

The 9A16, better known as the Centrifuge-based Flight Environment Trainer (CFET), has had a rough start to its life as a NASTP training device. First accepted as Ready-for-Training (RFT) in mid-April 1997, the device has been "down" several times for a number of mechanical, electrical, and computer related problems. Most recently the CFET was down from November 2001 to January

Continued on next page

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Despite these challenges, USN/USMC centrifuge training has never skipped a beat thanks to cooperative efforts between the USN's centrifuge training staff at NAS Lemoore and the USAF's centrifuge training staff at Holloman AFB. This "joint" effort has allowed both services to keep their training pipelines moving during periods when their respective centrifuge training devices were inoperable. This includes the training of 264 USN/USMC aircrew during 39 training dates at Holloman AFB from April-November 2002, and the training of 185 USAF aircrew during 18 training dates from January-February 2003.

Hopefully the days of extended device downtime and TAD trips to Holloman AFB have come to an end because of the efforts of NAVAIR Orlando TSD. The entire gearbox has been re-manufactured using a special hardening process, making it 40% stronger than before. The electrical power supply has been adjusted so the device is no longer blowing $200 fuses during every training session. Finally, Boeing has nearly completed a computer re-host that has significantly improved the performance of the device and eliminated frequent unexplainable computer crashes that extended the training day by several minutes to hours.

The ASTC Lemoore staff is very excited to be training tactical jet aircrew with this state-of-the-art device.

LT Loomis is the Director of Centrifuge Training at the Aviation Survival Training Center, Lemoore.

Billet Highlight

Director of Safety and Standardization, NSTI

by

LCDR Mike Prevost

The Job:

The DOSS is a newly created position and I am the first to fill the billet officially. Of course you know already that the position is located on NAS Pensacola on the second deck of the "glass palace" with a nice view of the bay. There are 5 major areas of responsibility for the DOSS: curriculum, SOP, Site Safety and Standardization Inspections, Quality Assurance and Revalidation Inspections and OSH issues. The Department of Safety and Standardization includes 2 officers, 3 enlisted personnel and 3 civilians. Your "dash 2" will be the Model Manager Department Head (generally a senior LT). Mike Graham (former HMC Graham) has been around the program for decades. He is the DOSS SOP expert and also teaches the NAWSTI classes. Mrs. Cora Asprer handles formatting all curriculum and SOP changes as well as change notices. Mr. Brian Swan writes curriculum and is currently developing NASTP online training courseware. There are also 2 PRs and an HM. The HM is assigned as a curriculum writer. One of the PRs assists with Site Safety and Standardization inspections as well as curriculum and SOP ALSS issues. The second PR is the QA&R Inspector.

Continued on next page

The DOSS represents the Director of NSTI on all Site Safety and Standardization Inspections (10 sites including the 3 Pensacola sites). The QA&R is generally (but not always) held in conjunction with the Site Safety and Standardization inspection as well. The DOSS manages both inspections. The inspections will have you on the road for at least 7 weeks out of the year. The inspection team consists of the DOSS, another curriculum/SOP expert (Mike Graham, Brian Swan or your "Dash-2), a PR and the QA&R inspector. You can count on at least 3-4 other short TADs as well. As the lead inspector, the DOSS briefs and debriefs the Department Head and OIC on the inspections as well as prepares the final report for submission.

If you want to have an impact on what and how we train at the ASTCs, this is the place to be.

The DOSS also manages the SOP. This is truly a living document that requires constant updating. The DOSS manages all SOP changes and makes sure that the document stays up to date with new training devices and curricula.

In addition, the DOSS has oversight over the curriculum development process by managing the Curriculum Advisory Board and the Curriculum Subject Matter Model Manager processes.

The final area of responsibility is working Navy Occupational Safety and Health issues. The DOSS is not the Safety Officer but works as a liaison between the NOMI Safety Officer and the training sites. The DOSS is also involved in safety issues dealing with new facilities or facilities modifications, test and evaluation projects, new curricula and current training policies.

Flight Time:
Flight time opportunities are plentiful if you like flying in orange and white aircraft. The flights are generally not exciting but they are available and convenient. There is generally something every day (except when those nasty thunderstorms roll in).

General Comments:
For those of you who remember the old Model Manager days, things have changed quite a bit. This is a great place to work. We finally have enough staff to do some of the things we should have been doing for years. There are some major developments in the works for the NASTP and the DOSS and HPTT are right in the middle of the action. Standing up NSTI has definitely had an impact on morale and the day-to-day operations of the NASTP, at least here at headquarters.

If you want to have an impact on what and how we train at the ASTCs, this is the place to be. The DOSS is right in the middle of the curriculum development process and can influence training quality through the site inspections as well. This billet is also great training for a future Det. West/East OIC. The DOSS gets a unique and thorough look at all of the ASTCs through the QA&R and Site Safety and Standardization Inspections as well as a thorough understanding of the SOP. The DOSS also gets a good look at the management of the NASTP program from a headquarters perspective. The Dash-2 position (Model Manager Department Head) is great training for a future Department Head. This is a busy job but it puts you right in the middle of the NASTP, the heart and soul of our program.

LCDR Prevost is the Director of Safety and Standardization , NSTI

Officer in Charge

DETACHMENT WEST UPDATE

by

CAPT. Donna Murdoch MSC, USN

The winds of spring are subsiding but the winds of change are increasing at ASTC Whidbey Island. (see figure 1) Over the next few months ASTC Whidbey Island will see the retirement of two highly qualified NAPTP staff and one 17-year civilian. The ASTC is also looking forward to the completion of its new Aircrew Water Survival Training Facility.

Figure 1

The week following Memorial Day was a busy one for the ASTC staff as it celebrated the retirements of HM1 Robert Johnson and PR1 Perry Fernandez. Both individuals have contributed greatly to the NAPTP over their tenures at the unit. HM1 Johnson's 21-year Naval career saw him spend 17 of those years in the NAPTP. Two of HM1's career highlights were his logging of over 100 hours on NVDs while at MAWTS-1 and his attainment of almost 6000 minutes of chamber flight time. Petty Officer Fernandez left a legacy in his development and design of a 32 page on-line web page that increased the effectiveness of aircrew training. Both men were significant contributors to the development of the "NITE-STORM". Their expertise and corporate knowledge will be a loss to the staff at Whidbey.

An integral member of the ASTC team, Mr. Ralph Ross is retiring after 17 years of civil service. Mr. Ross has been a consummate member of the staff as an Engineering Technician, instructor and mentor. Over his career at the ASTC, Mr. Ross made significant contributions to the NAPTP. Mr. Ross was awarded the Meritorious Civilian Service Medal for his service.

The ASTC staff is anticipating a flurry of activity in the next few months as the new Aircrew Water Survival Training Facility nears completion. Not only is the staff anticipating the completion, so are numerous aircrew as they plan their refresher training early to avoid the "dreaded dunker"! Comments have been heard from senior officers, "I can't stand the helo-dunker, when is your last class with Dilbert?" The projected completion of the facility is January 2004.

CAPT Murdoch is the OIC Det West and President of SUSNAP

Officer in Charge

Detachment East Update

by

CDR. TJ Wheaon, MSC, USN

Change is the news for Detachment East. The four East Coast Aviation Survival Training Centers enjoyed significant upgrades to training facilities. A new Aviation Water Survival Training Center opened at Patuxent River. Her sister ASTC's focused on Self-Help improvement projects during the war slow down. The revolving door continues to swing for inbound and outbound Physiologists.

ASTC Patuxent River dedicated the new Aviation Water Survival Training Facility. RADM Nancy Lescavage, the Commander of Naval Medical Education and Training Command, was the keynote speaker at a 19 May dedication ceremony. RADM Lescavage, RADM Heely of NAVAIR and Capt Freer cut the ribbon to officially open the facility for training. A host of our significant Physiology program brethren were in attendance.

The $4.3M facility makes Pax a full capability water survival training site for the first time. The Det awaits the filling of 9 newly transferred billets so full capability water classes may be conducted. As an interim plan, ASTC Norfolk and Cherry Point have proposed to supplement Pax with their instructors. The added NAWSTI's and Divers can conduct periodic "Device Only" days on site instead of sending students to Norfolk.

The new facility adds over 2600 square feet of training space. It is equipped with a state of the art electronic classroom, new administrative spaces, fashionable locker rooms and new training devices. The 9H1 Helo Hoist and 9F2 Para-drag devices from the old Norfolk pool were reconditioned and installed at Pax. A METS, or Modular Egress Training System was installed as a alternative to the old 9D5. The METS is a significant upgrade from the old Dunker, and can easily be reconfigured to simulate various aircraft fuselage
.

During the war, ASTC's on both coasts experienced a decrease in training demand. ASTC's at Jax, Cherry Point and Norfolk used the extra time for self-help improvement projects. Jax and Norfolk built new scenario based first aid training rooms. All of them used in-house artists to paint attractive and motivating military wall murals. Cherry Point developed a new curriculum for Initial Students (NP2/N5). LCDR Tom Mowell produced a very impressive addendum to the Preceptorship Program to train his Interns on Big Navy and Marine Corps culture. It is being employed Detachment-wide for new Interns.

July finds Lt Sean McCarthy detaching ASTC Norfolk for Safety School and eventual Green Side duties with MAG-29, MCAS New River. Lt Chris Cooper detaches in August for Monterey and an exciting overseas assignment in Okinawa, MAG-36. The fall anticipates Physiologist transfers for Lt Orlando Olmo, Department Head ASTC Pax, and Lt Russ Linderman, the Department Head at Jacksonville. LCDR Humphrey Minx will be piped aboard ASTC Jacksonville at the beginning of July. He reports from Fourth MAW in New Orleans. CDR Bill McCormack (remember him?), has been identified as relief for the OIC and will likely replace me in December. He is rolling off a hot out-fill tour at the Naval Academy.

The Senior Enlisted Advisor, HMCM Eddleman was selected and advanced to Master Chief Petty Officer in April. He joins 7 other Det Sailors advanced during the last promotion cycle. Those Sailors enjoying advancement were HM2 Warren Graves (Norfolk), DC2 Albert Medina, HM1 Giovanna Blaesing (Pax), HM1 Ron Wichman (Pax), PR1 Chris Joseph (Pax), HM2 Damon Browne (Jax), and PR1 Jennifer Knopf (Jax), who was also selected to the Seaman to Admiral Officer Commissioning Program.

CDR Wheaton is OIC Det East and an editor for SUSNAP

Change of Charge

Director of Naval Survival Training Institute

by

CDR. TJ Wheaon MSC, USN

In a May 30 Change of Charge Ceremony, Commander Donald R. Plombon relieved relieve Capt. Ryan B. Eichner as the director (OIC) of Naval Survival Training Institute (NSTI).

Captain Douglas Freer, Commanding Officer NOMI, provided keynote remarks. He honored the growth of NSTI as a new component of the command. He also recognized the many contributions that Captain Eichner and NSTI made to the command as a whole. In his parting remarks, the NOMI CO characterized CDR Plombon as the best hand-picked man for the NSTI job.

Commander Donald R. Plombon

Captain Eichner retired from active duty, after 23 years of service, in a ceremony immediately following the Change of Charge. He and his wife Peggy will retire to Abilene, Texas.

The new NSTI Director was recently selected for the rank of Captain. He was born in Red Wing, Minn., on Aug. 16, 1959. After graduating in 1977 from Technical High School in St. Cloud, Minn., he enrolled at St. Cloud State University where he received a Bachelor of Arts degree in biomedical science on May 28, 1982.

CDR Plombon was commissioned an Ensign in the United States Navy on Jan. 6, 1983, and began training as a Student Naval Aerospace Physiologist on March 4, 1983. He was designated Naval Aerospace Physiologist No.129, and received his "Wings of Gold" on Aug. 25, 1983.

From September 1983 to June 1986, he was assigned to the Naval Aerospace Medical Institute, NASP, where he completed a division officer rotation with in the Aviation Physiology Training Unit. From June 1986 to August 1989, he was assigned as the Department Head, Aviation Physiology Training Department, Branch Clinic, NAS Brunswick, Maine. CDR Plombon was then ordered to the Naval Postgraduate School, Monterey, Calif., to attend the Aviation Safety Officer course. He was designated an Aviation Safety Oofficer on Sept. 27, 1989.

CDR Plombon graduated from Safety School to start a long relationship with the Marine Corps. From October 1989 to October 1992, Cdr. Plombon served as the Aeromedical Safety Officer (AMSO) with Marine Aircraft Group 29, MCAS New River Jacksonville, N.C. From November 1992 to July 1995, he served as an instructor with Marine Aviation Weapons and Tactics Squadron One, MCAS, Yuma Ariz.

He was selected for full-time outservice training, and attended Central Missouri State University, Warrensburg, Mo. In August 1996 he received a Master of Science degree in Aviation Safety. He was subsequently assigned to the 4th Marine Aircraft Wing Headquarters, New Orleans, La., as an AMSO from October 1996 to November 1999. He again was selected for full-time inservice training, assigned a fellowship with the Naval Education and Training Professional Development and Technology Center,Saufley Field, from December 1999 to December 2000. He did leading work in advanced training technologies.

CDR Plombon was assigned as the Officer in Charge (OIC), Naval Operational Medicine Institute, Detachment Central, NASP, from December 2000 until October 2002. Upon the BUMED realignment that created NSTI, he reported as the Deputy Director on Oct. 1, 2002.

He has been married to the former Robin Mae Midas of Clear Lake, Minn., since 1984. They have two sons, Nick, 15 and Justin 12.

Captain Ryan B. Eichner, MSC, USN. Born in Westbrook, Minnesota on 20 March 1953. After graduating in 1971 from Shawnee Mission South High School in Overland Park, Kansas, he entered Iowa State University in Ames, Iowa and graduated with a B.S. degree in Zoology in 1975. Enlisting in the Navy in September 1976, he attended Aviation Officer Candidate School at Naval Air Station Pensacola and was commissioned an Ensign in January 1977. He subsequently trained at Naval Air Stations Whiting Field, Florida and Beeville, Texas. In January of 1978, Captain Eichner separated from the Navy to attend the Graduate School at Iowa State University as a graduate research assistant and he received a Master of Science in Physical Education specializing in Exercise Physiology in 1981.

In December of 1981, Captain Eichner was commissioned a Lieutenant Junior Grade in the Medical Service Corps and returned to active duty at the Naval Aerospace Medical Institute, Pensacola, Florida as a Student Naval Aerospace Physiologist. He received his "Wings of Gold" and was designated as Naval Aerospace Physiologist number 119 in August 1982 and was then assigned as the that Training Division Officer at the Pensacola Aviation Physiology Department. In September 1983, he attended the Aviation Safety Officer's Course in Monterey, California. Upon graduation, he was assigned to Naval Hospital Corpus Christi, Texas as the Aeromedical Safety Officer (AMSO) serving Naval Air Stations Corpus Christi, Beeville, Kingsville and Dallas, Texas. In 1985 he was selected as the Naval Aerospace Physiologist of the Year and his subsequent duty stations included tours as the Third Marine Aircraft Wing AMSO at Marine Corps Air Station El Toro, California from June 1986 until May 1990 and Fourth Marine Aircraft Wing AMSO based in New Orleans, Louisiana from May 1990 until June 1993. In 1993 he reported to Headquarters, United States Marine Corps Safety Division as the Marine Corp's AMSO Program Coordinator until June 1997. Captain Eichner was selected to be the Navy and Marine Corps Liaison Officer at the Air Force Research Laboratory in Mesa, Arizona from May 1997 until February 2001. In April 2001, he reported to the Naval Operational Medicine Institute as the Director of the Naval Aviation Survival Training Program. In August 2002, the Chief of Naval Operations approved the formation of the Naval Survival Training Institute

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and Captain Eichner was appointed as the Officer in Charge.

Captain Eichner is Board Certified by the Aerospace Medical Association as an Aerospace Physiologist. In 1997, he was that organization's recipient of the Fred Hitchcock Award for Excellence in Aerospace Physiology. He has served on the Board of Governors of the Society of Aerospace Physiologists and is a board member of the Society of United States Naval Aerospace Physiologists.

His military awards include the Meritorious Service Medal (three awards), the Navy & Marine Corps Commendation Medal (two awards). Other service medals and awards include the Meritorious Unit Commendation, Fleet Marine Force Ribbon, National Defense Service Medal with Bronze Star and Navy Expert Pistol Shot Medal.

Captain Eichner is married to the former Peggy Elizabeth Dickey of Quemado, Texas. Captain and Mrs Eichner will reside in Abilene, Texas after retirement.

"PITBULL"
FAIR WINDS AND FOLLOWING SEAS
AND GOOD LUCK FROM ALL

The 30th of May marked the end of 23 years of Naval Service for one of our own, CAPT Ryan "Pitbull" Eichner. You have just finished reading the Bio of CAPT Eichner's many accomplishments during his time as an Aerospace Physiologist. But above what is written, he served as mentor and friend to many of us. It is hard to imagine a FAILSAFE meeting without him setting us straight on some piece of history or reminding us that the ROBD is the wave of the future for physiology training. CAPT Eichner served both on the Boards of SUSNAP and the Aerospace Physiology Society of ASMA. He was never afraid to set a course for success for our program even if it meant going against the tide. The experience he gained throughout his career prepared him well for the challenge he accepted during his last assignment as the first Director of NSTI . He set a straight course for us to follow to the future.

Thanks "Pitbull" for a job well done.

The future holds more challenges for CAPT Eichner. He has designed and built his dream home in Texas and we wish he and Peggy all the happiness.

CAPT "Mad Doc" Murdoch

Fair winds and Following Seas

AMSO Training

AMSO Training

CAG 11 CSAR Radio Training

by

LT Mike Kavanaugh, MSC, USN

Truly the opportunity to support our troops on board the USS Nimitz steaming into harms way was the reason we all signed on the dotted line. Operation "Iraqi Freedom" began while LCDR Patterson and I were TAD aboard the USS Nimitz so the energy was palpable among the aircrew and sailors. All eyes were fixated to every available television. The trip started as the result of an operational requirement from CAG-11 staff requesting PRC-112B1 training. Due to some hard work from LT Yeager diligently setting up this trip we hit the pavement burning rubber on our mission. We arrived in Honolulu the day before the Nimitz was due to cruise out of Pearl to make contact with CAG-11 staff and to set up equipment. That evening we met up at an undisclosed clandestine "dehydration" facility in the back of the Hale Koa for the training pre-brief. Due to a last minute ship deployment change the Nimitz pulled out later than we originally thought. So, after the following morning's spontaneous "Beach" DET, we finally secured berthing a bit less for wear turning in around 2359.

It was rather profound to awaken in the morning and witness this 1100 foot "Big Stick" being swung around in Pearl harbor with the Missouri battleship and the Arizona memorial in the background. The almost insignificant tugs labored to turn this 180 million pound vessel in a tight circle around 180 degrees to face the expanses of the Pacific ocean. The Nimitz cruised out of Pearl Harbor off to points west to begin their direct role in "Enduring Freedom" and the admirable yet daunting task of "Iraqi Freedom". By days end, all lands were out of site as we knifed through the deep waters with only the occasional sea bird floating in the air next to the carrier. These south Pacific waters have such a rich deep blue color with an almost phosphorescent emission of light, that you have to see it to appreciate it.

The first day was spent setting up the computers to load the PRC-112B1 radios. It was at first amusing to see the puzzled look on Dan's face when we couldn't load the radios. After a few hours and significant computer integration problems with the Motorola software the look on my face might have been categorized with those "Real" people from the "Blair Witch" project. After much effort and

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some good resources Dan brought with him, we solved the computer problem initially for training purposes. Lesson learned, during workups check with CAG staff to ensure they have the right hardware that is compatible with the Motorola software. By 2300 as I pulled the plug out of computer warrior Dan's smoking skull, we finally were ready for the next day after melting a few brain cells.

The previous day entailed several dozen fore/aft trips to meet with all squadron OPSO's, PR loft LPO's and pertinent CAG staff. Careful preparation by LT Yeager and LCDR Patterson to set this trip's logistics and technical support up made our training extremely successful. Our briefings started at 0800 and continued non-stop until the last flash of sunlight turned a pinkie into a night trap. 144 student contact hours were conducted this first day of training PRC-112B1's and PRC149's. One day rolled into the next as our volume of briefings enveloped over 15 hours of each day. It seemed to be an overwhelming volume of work at times, however, it is these intense jobs that makes these trips truly rewarding. Evenings as we sat down in the wardroom at 2230 it was a great feeling to have accomplished so much in one day. After 9 days of training we had conducted over 725 student contact hours for our CAG-11 Combat Search and Rescue Radio training mission.

The highlight for Dan and myself, of course, was the chance to fly. Dan had a flight in a Prowler (see picture), while I flew in an E-2C. During the flight I opened one of the small circular metal window covers to see the setting sun over the Pacific. With a half smirk on his face the XO of VAW-117 jokingly said to me, "Hey Chunky, although my days of having kids are probably over, I still would like to keep everything in good working order". After I asked a quick question, he explained to me the amount of electromagnetic radiation the E-2C dome pumps out during operations. "Say no more, sir". I promptly closed the cover. The highlight for me surely was the chance to copilot an H-60. I was given the opportunity to pilot the Seahawk off the deck, while acquiring 2hrs of stick time out of the 3 hr flight. As I flew the 60 off the deck, glancing over to notice the pilot had his hands off the cyclic and collective, I briefly thought, "Don't screw it up". Dan had a hard CAT shot and was at 170+

"Danger" Dan

knots before the end of the CAT stroke. Add several surface-to-air missile defense maneuvers performed at the absolute structural limits of the Prowler, a running rendezvous over the carrier with the strike package in flight, a few carrier touch-and-go's before the final trap, and you have the flight of a lifetime. These are the highlights we'll think about decades from now when we're retired and walking through the Naval Aviation Museum in Pensacola.

We flew to Guam via the COD into Anderson AFB. Out of "Planes, Trains and Automobiles" the rental car we got had us laughing for several days. The license plate was strategically placed on the front dash and would slide back forth while driving, the doors wouldn't lock, and the transmission and engine didn't kick in until about 5 seconds after depressing the gas pedal. The body of the vehicle looked like it had been used to round up wildebeast and rhino's in Africa, you know, those old beaters they used on Mutual of Omaha's Wild Kingdom. The interior looked liked two long hall truckers had had a fight to the death with hot coffee. What a gem, and this was the luxury model! The Guam experience was worth a few laughs for me as I watched Dan get interrogated by no less than five airport security guards about the AR-5 Aviation CBR gear we had toted out to the boat. It sure helped when one of the guards walked over, took one look at the gear and said, "that's MOPs gear". This fella had retired out of the Marine Corps thankfully.

Listen folks all kidding aside. These carrier trips are one of the powerful reasons why we do our jobs as Aerospace Physiologists. It does CDR Syring's, LCDR Milligan's, LCDR Blow's and the rest of our FAILSAFE team's hearts good knowing they receive

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AMSO Training

2 Nights on the USS Carl Vinson 2 Nights in Guam 2 Night in Atsugi Japan

by

LT Meredith Yeager, MSC, USN

This trip was put together to introduce the LPU-36 flotation collar to VS-33 on the Carl Vinson (to be met in Guam) and to introduce the PRC-149 radio to VS-21 at NAF Atsugi, Japan. PRC Oliver, FAILSAFE West, traveled with me to assist with the training. The planning was very short notice and I only had about two weeks to get everything set up after being contacted by SEACONWINGPAC. I left San Diego Friday morning and after 12 hours on various commercial planes, including a stop in Honolulu where I met PRC Oliver, I arrived Guam Saturday afternoon. After some clever e mail communication, two VS-33 pilots greeted us at the Guam airport and took us to "Big Navy" where we walked on the USS Carl Vinson. Berthing was also all set up by VS-33, so we settled into our staterooms for the night trying to catch up on some sleep. The boat pulled out Sunday afternoon and my training wasn't scheduled until Monday morning with VS-33. So, with no flight operations going on it gave PRC Oliver and I a chance to visit all the squadrons. Once we completed the VS-33 PR training on the LPU-36 we went PR shop to PR shop gathering problems and addressing any issues the PR's had with ALSS gear. It was an eye opening experience for me and it gave us the opportunity to see what the real issues are with our deployed PR's.

"having good contacts at the squadron is the key to success."

Monday was the LPU-36 introduction for VS-33 aircrew and then we were on the first COD off the boat. Getting off the boat was all set up by VS-33 and all we had to do was get our luggage to the ATO shop and wait for our safety brief. Couldn't really believe it at first, that we were getting off on the first COD, but then there we were getting strapped in and getting ready for take off. I have to tell you this was my first COD ever off the boat and I was just a little nervous, especially sitting backwards. I didn't really know what to expect on on takeoff, and I am still looking for a way to describe it. We could see Guam from the flight deck, so the flight was only 15 minutes. Once back in Guam the beach det for the Carl Vinson picked us at Andersen AFB and took us to our hotel. So, now two lovely nights in Guam. Having been to Guam once before, I knew that the only thing really to do to pass time was to board the shopping bus for $2.00 and take a little tour around the Island.

I left Guam Wednesday morning and headed for Japan, PRC Oliver left later that day. I arrived the Tokyo Narita airport and was greeted by two pilots from VS-21 who drove me to NAF Atsugi, about two hours south of Tokyo. This was my 5th trip to NAF Atsugi in three years so I am really familiar with where everything is located and how to get around base. The PRC-149 radio training was scheduled for Friday morning, but I had also told the CVW-5 CSAR rep I was coming, so I had additional training scheduled. Two hours after arriving Atsugi I was standing in VFA-192's ready room introducing the PRC-149 radio and then training the PR's as well. I was also able to provide annual laser safety training for VFA-27 pilots and maintainers. I also made the rounds to HS-14 and HSL-51, can't forget about my helo bubbas! After my training Friday at VS-21 I caught the shuttle bus to the Narita airport, happy to be heading home to San Diego!

Overall, this was the most productive trip I have ever been on. I was able to maximize my time on the boat and in Atsugi and provide a lot of squadrons various additional training. As we have all heard before, having good contacts at the squadrons is the key to a successful trip. VS-33 and VS-21 were so helpful with transportation and making sure I had everything I needed. Having a ride to the boat in Guam saved us a $60 cab ride and the trip back to Atsugi is 2 hours by car, so I didn't have to find my way on the trains or worry about the shuttle bus. Being organized and keeping in touch with the

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AMSO Training

Balikatan 2003

by

LT Dave Peterson, MSC, USN

I have been afforded several unique opportunities since being assigned the AMSO for Marine Aircraft Group (MAG) 36. I have deployed three times aboard four ships, traveled to four continents and ten countries. Of all my experiences to date, one of the best was participating in Balikatan.

Balikatan, now in its nineteenth year, takes place in Republic of the Philippines (RP). The term Balikatan translates to mean, "shouldering the load together". Balikatan is an annual event designed to improve relations between the RP and US through combined military planning, joint exercises aimed at increasing operational readiness, and demonstrating US resolve to support the RP against external aggression. Since 2001 Balikatan has also included counter-terrorism training.

The first Balikatan exercise took place in 1981, but ended in 1995 because of a dispute over the US-RP Visiting Forces Agreement, which gave the US jurisdiction over crimes committed by military personnel while on duty in a foreign country. Balikatan was reinstated in May of 1999, despite protests from the Catholic Church and other anti-US elements in the Philippines.

Phase I of Balikatan is a Combined Joint Task Force (CJTF) seminar/command post exercise focusing on crisis action planning and course of action execution at the operational level with a focus on peace enforcement operations. Phase II includes cross training, field training and humanitarian civil assistance exercises aimed at enhancing interoperability between RP and US forces. Training events for the exercise are held on the northern island of Luzon, specifically: Clark Air Field, Fort Magsaysay, and in the vicinity of Ternate.

The First Marine Aircraft Wing (1ST MAW) is the Marine Forces Pacific (MARFORPAC) Air Combat Element (ACE) for Balikatan. Generally, air assets from MAG-12 (F/A-18C/D) and MAG-36 (CH-46E, UH-1N, AH-1W, CH-53E, and KC-130) attend to integrate with the Philippine AF (UH-1H, C-130, MG-520, OV-10, BN-22, and F-5) for joint operational training.

My involvement in Balikatan was providing introductory NVG training, along with three Night Systems Instructors (NSIs) from HMM-265, to the Philippine AF. One of the more memorable experiences of Balikatan was conducting a Low Altitude Training (LAT) flight with VMGR-152, a KC-130 squadron based out of MCAS Futenma. A LAT is a low-level threat avoidance flight conducted at 500 feet AGL and 240 knots. With all the yanking and banking going on, if you were ever to get sick in a KC-130, this would be the flight. During the LAT we flew directly over Mt. Pinatubo.

For those unfamiliar with Mt. Pinatubo, the volcano erupted in July of 1991 after lying dormant for over four centuries. The eruption was so violent that more than 5 billion cubic meters of ash and debris were ejected 18 kilometers wide and 30 kilometers high. In its wake, 847 people were killed, 184 injured, 23 missing, with more than one million

Continued on next page

displaced. For months, the ejected volcanic materials remained suspended in the atmosphere reaching as far as Russia and North America. Mt. Pinatubo's eruption was the world's most violent and destructive volcanic event of the 20th century.

The MARFORPAC ACE stayed at the Fontana Resort on Clark Air Force Base. Fontana is an old US military housing area converted into resort villas. Fontana also includes a water park, casino, and a combined restaurant/shopping facility. Clark was a USAF base until 1991 when the US evacuated due to the eruption of Mt. Pinatubo.

Balikatan is just one of many such exercises conducted by 1ST MAW within the Pacific AOR. Others include deployments to Thailand, Indonesia, Malaysia, New Zealand, and Australia. Take these travel opportunities into consideration if you are ever offered the AMSO position for MAG-12, MAG-24, MAG-36 or 1ST MAW. I did, and it was the best decision I ever made.

LT Peterson is the Aeromedical Safety Officer for MAG 36.

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squadrons will only help you. I had also been to Guam and Atsugi before, so I knew my way around and I felt comfortable. I also highly encourage to bring any training aids, if available. I was able to bring a PRC-149 training radio, and a torso harness and a LPU-36 so the pilots could see the LPU-36 inflated. I was also able to repeat that training for VS-21 after PRC Oliver got the collar repacked by AIMD Atsugi. If you're going to travel that far might as well make it worthwhile to everyone. I was very lucky on this trip that everything went as planned and I had no problems with transportation because both squadrons were very welcoming and helpful. PRC Oliver was also there and it was nice knowing I wasn't alone on the trip. If anyone finds themselves heading to Guam or Atsugi, let me know. I'll pass on the gouge I have. This was my last trip as the AMSO for HSWINGPAC and it was a great one!

LT Yeager is the Aeromedical Safety Officer for North Island

CAG 11 CSAR Radio Training
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these training sessions before flying into "Harm's Way", and a potential downed aviator situation. The XO of VFA-94 put it best at the end of my brief by turning to his aviators and saying, "Listen fellas this radio is your life on the ground... YOU NEED... to learn this radio, since getting back to your family someday could depend on this CSAR radio." An integral part of our community's future rides on the backs of forward deployed AMSOs, especially our colleagues out in the Sand Box, so it's truly an honor to participate in these missions.

Chunky and Dan out.
Post Amble: You can get a complete "Lessons Learned Trip Debrief" from LCDR Milligan or LCDR Essex.

LT Kavanaugh is the Aeromedical Safety Officer for Point Magu.

FY03 AIRCREW SYSTEMS OPERATIONAL ADVISORY GROUP (OAG) MEETING

23 June – 26 June 2003
Admiral Kidd Conference Center
Fleet Anti-Submarine Warfare (ASW) Center
San Diego, CA

MEETING SUMMARY

COMNAIVAIRFORES (NOOAS) hosted the FY03 Aircrew Systems Operational Advisory Group meeting which was held at the Admiral Kidd Conference Center, ASW Base San Diego, CA. Individuals representing USN/USMC Squadrons and Air Wings, Aviation Type Commanders, Aeromedical Safety Officer's/Corpsman, ASTC personnel, NAVAIRWARCEN, HQMC, and OPNAV attended this meeting.

The purpose of this working meeting was to enhance the communication on development/acquisition/Fleet support of Aircrew Systems Products between Fleet users and OPNAV/HQMC/PMA-202 Requirements and Program Officers leading to a Fleet consensus on a Top Ten Aircrew System Priority list of near term requirements. The objectives of the meeting are to develop a fleet-wide consensus on a priority list of aircrew systems requirements and equipment procurement funding priorities, to recommend OPNAV sponsored aircrew systems funding priorities, and to assure the progress on the projects of the three aircrew systems FY02/03 In-Service Management Panels (IMP's) align with the Aircrew Systems OAG Top Ten Priority Lists and Endorsements.

The OAG Executive Board (EB) composed of ten individuals representing USN/USMC Fleet users, develop the master Top Ten priority list from the top ten priority lists of the three community forums that make up the OAG. The community forums are the Rotary Wing Community, the Fixed Wing Ejection Community, and the Fixed Wing Non-ejection Community. The EB also forward to CNO (N88) a list of safety/mission effectiveness concerns.

ROTARY WING TOP 10

1. Survival Vests
2. Crashworthiness/Restraint Improvement
3. Survival Radio/Electronics
4. Aircraft Communications Improvements
5. CBR
6. Environmental Protection
7. NVS\HMD's
8. Seat Cushions
9. Logistics\Fleet Support\Training Assets
10. LEP

FIXED WING NON-EJECTION SEAT TOP 10

1. NVG's
2. Crashworthy Aircrew Seats
3. Procure combat radio to 100% vest plus spares
4. Active Noise Reduction\Passive Noise Reduction
5. Interim combat radio support
6. Crashworthy Passenger Seats
7. Wireless Intercom System
8. Thinpack (add new requirement for T-34 and legacy aircraft)
9. Program related Logistics\Fleet support
10. Portable O2 system

FIXED WING EJECTION SEAT TOP 10

1. Seat Endurance\Seat Cushions
2. Survival Radio Batteries Interoperability
3. Helmet Mounted Displays
4. Theater Specific Seat Kits
5. Radio Intelligibility
6. Panaramic NVG's
7. Hearing Protection
8. Ejection Seat Stability
9. Low Profile Mic for O2 Mask
10. Sate of the Art Survival Gear

From a Pioneer in Aerospace Physiology

RETIREMENT
LESSONS TO BE LEARNED

by

CDR (ret) Guy Banta,
Ph.D, M.P.H., MSC, USN

"Your previous assignments, your current assignment, and your final assignment-Retirement Lessons to be learned."

You know, I think including various articles of guidance in this journal regarding retirement is an excellent idea. It would have been nice to have something like this during my career. Hearing from colleagues who have gone before helps to eliminate some fears and also prepares you for the "excitement" of the final assignment …**RETIREMENT**.

When Ragu asked if I would write an article his words were, "Young guys like myself love to hear "words of wisdom" from pioneers in the program like you." Sometimes you forget how old you are getting until someone refers to you as a "pioneer." But, I guess I am. It is hard to believe that I hit my 10th year of retirement this month. I guess that does suggest that I may have been one of the pioneers. Actually, it's a compliment and I thank Ragu for the title. My Aerospace Physiologist number is "77." What's yours?

Similar to a couple of previous articles that I have read from fellow Aerospace Physiologist Retirees I think a little quick history about my (Guy Banta's) "Phys Biz" will help you see how each of your assignments can provide you value-added experiences (lessons) that can be used during retirement. By the way, "Phys Biz" was on the side of my helmet my entire career.

My pioneer years actually began as a transition from the enlisted ranks (HM1). I was one of those Vietnam Era Corpsmen. When I finally recovered from a little scratch I received in another place you can find in your history books called "Khe Sanh" I decided that there must be a better way of making a living and went back to school on the GI Bill.
FIRST LESSON: Take advantage of all and any Government sponsored educational programs that you can. They are priceless!
SECOND LESSION: I believe was mentioned in a previous article, maintain good documentation of all injuries and illnesses acquired during active duty. Also have these evaluated prior to retirement to determine eligibility for any VA disability compensation.

My first officer assignment was actually as a Hospital Administrator while I was waiting for final selection to the Aerospace Physiology Program. As an Ensign I learned a lot about the inner workings of Hospital Administration.
THIRD LESSON: When the opportunity presents itself, learn from other non-standard Physiology business areas, e.g., contracting, procurement, acquisition, personnel, etc. You will see it again and the more you know the better for any aspect of retirement that you may go into.

Following training, at then NAMI, and Primary Flight Training (solo qualified) I moved on to a

Continued on next page

Training Unit and gained the finesse of teaching and presenting.
FOURTH LESSON: If you love it, teach it. Our program provides you top-of-the-line instructional training and experience. This capability is extremely valuable in business, education, and volunteer/social activities during retirement. It was during this assignment I went to evening college to acquire my first Masters Degree using the Government's Continued Education Assistance Program. **REMEMBER THE FIRST LESSON**.

During my early days, the AMSO program was just beginning. I was given the opportunity to "go to the fleet" and be an AMSO. This was absolutely the most outstanding tour of all!
FIFTH LESSON: Make an effort to learn your customer's business from within the business. Know how to speak his/her language. It proves to be priceless on your resumes. It was during this assignment I had the opportunity to attend the Naval Post Graduate School for their Aviation Safety Course. **REMEMBER THE FIRST LESSON**.

Following the AMSO tour I was accepted to Graduate School for a Ph.D. in Medical Physiology as part of the Navy's In-service Training Program. **REMEMBER THE FIRST LESSON**. Here I was able to add what the Aerospace Physiology Program taught me to a new love I acquired for research.
SIXTH LESSON: Capitalize from all of your Navy career experiences and apply all to each new assignment. Your portfolio at retirement as represented by your resume won't be matched by many.
SEVENTH LESSON: Prepare a resume and/or curriculum vitae and keep them up to date. They will prove to be your greatest assets when looking for post Navy employment.

In addition to beginning the development of a research technical skill, as a research department head after graduate school I was given the opportunity to direct a number of junior scientists, technicians, and administrative personnel.
EIGHTH LESSON: Strive for varied leadership positions during your career. Such roles are strongly looked upon, especially in the corporate world.

Following my first research assignment I was given an opportunity to work and network at the "Mecca," Bethesda/Washington DC as the Navy's Program Manager for Aerospace Medicine and Human Performance. This provided the opportunity to become greatly involved with tri-service organizations, international governments and agencies, varied academic institutions and numerous professional associations.
NINTH LESSON: Network! Become involved with professional and social organization within the service and outside. You will gain long term friends and colleagues that you will undoubtedly interact with in your retirement years as well. You will find these connections helpful in many professional and personal ways.

My last active duty assignment gave me the experience of command as both an Executive Officer and as a Commanding Officer. **REMEMBER THE EIGHTH LESSON**. It was during this tour I was also able to pick up my second Masters degree utilizing an Out-service Education Program at night. **REMEMBER THE FIRST LESSON**.

After 28 years of service my wife and I decided it was time to do something else. The Navy was always the greatest fun. I wanted to do something else before it quit being fun. I was in zone for 0-6 but felt that it was not fair for others to stick around to just see the results when I had already decided to move on. So we did.
LESSON TEN. Do not be afraid of the unknown. But, do due diligence before. Determine first where you want to live and what you might like to do. Don't wait until the last minute. Begin thinking seriously about retirement life about two years before your actual expected date. Then after retirement, take a little time off before starting any thing new. It will still be there when you are ready.

Conclusion:

THERE IS LIFE AFTER THE NAVY. In fact, a great exciting life. I have had the opportunity to work at NASA involved with the Shuttle and International Space Station programs and in the corporate world directing research development for an international science company. Every one of my

Continued on page 43

FAILSAFE 2003

Naval Aerospace Physiologist of the Year

2003 FAILSAFE AWARD Winners


Junior Corpsman of the Year


Senior Aerospace Physiologist of the Year

ASMA San Antonio 2003

Passing the mantle

Lando awarded
Wiley Post award

A Day in the life of a Physiologist

Continued from page 37

Navy assignments has taught me something that I have been able to use during retirement, both professionally and socially. Learn from each of your assignments. Their lessons will be golden in your retirement. When it's your time, come join us. The water's fine!

Keep them flying and flying safe.

Guy

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Next Issue

October 15, 2003

-Hear from the combat AMSO's

-NSTI History

-AMSO training at PAX

-Billet Moves

-Meet the current preceptors

-Preceptor's rage in the sky flying the FA-18

-AND MUCH MORE.....

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The success of this journal depends exclusively upon member contributions. If you are involved in a special project, find some useful gouge or training opportunities, or just have something to say, please sent it to one of our contributing editors. If you have any specific questions or comments please send them to LT Sean Lando. He can be reached at sean.lando@navy.mil or DSN 949-1028. SUSNAP also welcomes photographs of any kind. Let's get the word out to our members and make the SUSNAP journal the best it can be.

FAIR WINDS AND FOLLOWING SEAS

I would like to express my gratitude and that of our entire community to COL Britt Marlowe on the occasion of his retirement after 29 years of service from the Air Force. As any of you are aware, COL Marlowe had a tremendous working relationship and friendship with the Navy Aerospace Physiology Community. He, additionally, served in many capacities within the Aerospace Physiology Society of ASMA. He has made a lasting impact on the future of Aerospace Physiology throughout the world. I was able to represent our community at his Change of Command and Retirement Ceremony on 27 Jun at Beale AFB. It was a great send off into his next career. He asked me to personally thank his colleagues within the Navy Aerospace Physiology Program both active and retired for the unending support he experienced throughout his Air Force career.

With his retirement the challenge goes out to each of us to continue fostering working relationships with our Air Force counterparts. This only serves to make us stronger professionally as we solve the challenges of the future.

CAPT Donna Murdoch

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