

INSIDE THIS ISSUE

- AEDC police, OSI lend a helping hand to local authorities during Bonnaroo ... Page 3
- The geese are back, but not for long ... Page 3
- The people in charge of keeping AEDC's past alive are looking toward the future ... Page 9
- Lieutenant returns from Afghanistan ... Page 12

General Hoffman visits AEDC



Gen. Donald Hoffman, left, Air Force Materiel Command commander, and Col. Michael Panarisi, AEDC commander, take an aerial survey of recent storm damage to Arnold during the general's June 15 visit here. The general's one-day trip also included tours of the base's model shop and wind tunnel and space chamber facilities. (Photo by Rick Goodfriend)

Kiwanis fireworks, air show tonight

The Kiwanis Club's annual "Independence Day Air Show and Fireworks Display" will be held tonight at Tullahoma Regional Airport from 3-9 p.m. The event is free to the public.

The air show will begin at 6 p.m. The 2011 air show and fireworks display celebrates the Independence Day holiday, the 60th anniversary of Arnold AFB and the Centennial of Naval Aviation.

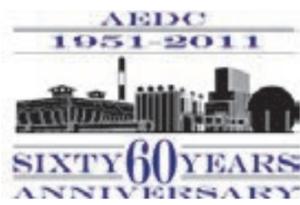
AEDC will have several displays highlighting its contributions to powered flight during the past 60 years. For show attendees who want a taste of flight themselves, "Acro Air" of Moontown, Ala., will again be selling rides in its Boeing Stearman biplane from 3-6 p.m. today and again tomorrow morning.

Coolers with non-alcoholic beverages are permitted. Sunscreen and protective clothing are recommended as are flashlights to exit the air show grounds.

Aircraft that will be flying in the air show include an F-16C Fighting Falcon, DR-107, P-51D Mustang and an A-10C Thunderbolt II.

Static displays will include an F/A-18C Hornet, Beechcraft T-34C Turbo Mentor, T-45C Goshawk, Bell TH-57C Sea Ranger, AH-1W Cobra, Beechcraft T-6B Texan II, Aero Vodochody L-39C Albatross, Vans RV-7A, Bell OH-58A+ Kiowa and an OH-58D Kiowa Warrior.

AEDC extends beyond Tennessee: Tunnel 9 and NFAC



By Philip Lorenz III
Aerospace Testing Alliance

From AEDC's inception in 1951 to today, two other world-class aerospace testing complex's have closely paralleled Arnold's 60-year history in significant

ways.

The Naval Ordnance Laboratory (NOL) at White Oak, Md., was established in 1944. The scope of work there would eventually lead to the development of the Navy's Hypervelocity Wind Tunnel 9 facility, which became the first of AEDC's two remote testing sites in 1997.

At the National Full-Scale Aerodynamic Facility (NFAC), in Mountain View, Calif., engineers have conducted aerodynamic testing at subsonic speeds since

the 40-by-80-foot wind tunnel was built in 1944. NFAC was originally managed by the National Advisory Committee for Aeronautics (NACA), NASA's predecessor. In 2003, NFAC, now the site of the two largest wind tunnels in the world at the NASA Ames Research Center, was closed and deactivated as part of a NASA decision to reduce operating costs.

In 2006, NFAC became the second remote site to be managed by AEDC.

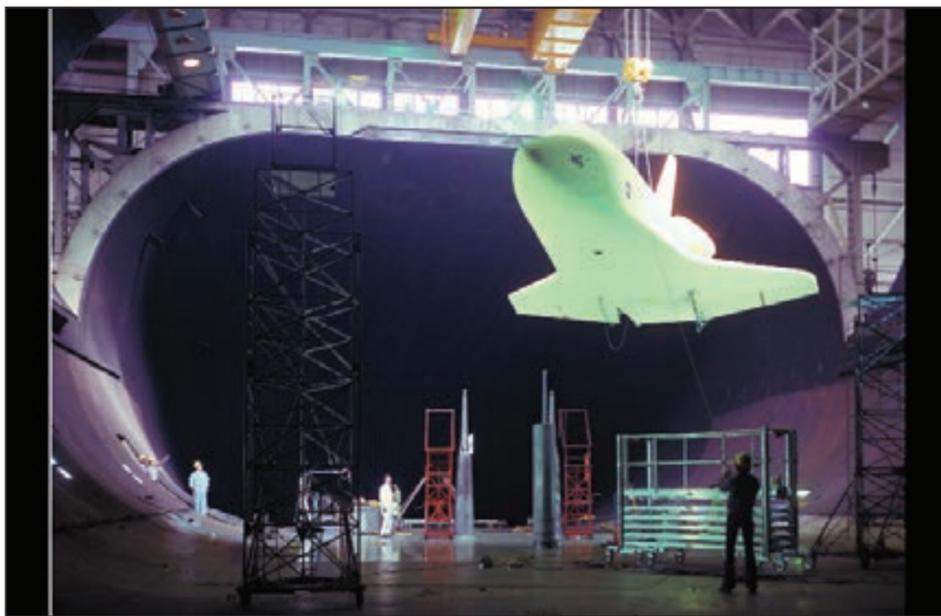
Hypervelocity Wind Tunnel 9

After World War II ended, the U.S. brought two German wind tunnels, T-1 and T-2, for use at the NOL. These tunnels played an important role in the genesis of a fledgling U.S. supersonic research program. Until 1995, T-1 was still used at the Tunnel 9 complex, but only as a calibration laboratory.

Dan Marren, Hypervelocity Wind Tunnel 9's site director, said the German tunnel was still in use when he first came to work at Tunnel 9 for the Navy.

"I came on board in 1984 as a co-op from the University of Cincinnati," he recalled. "We had modified T-1 from its original

See REMOTES, page 5



In 1975, a scale model of the space shuttle orbiter is installed into the 40 by 80-foot wind tunnel at the NFAC for subsonic aerodynamic testing of what the vehicle would experience during the latter stages of re-entry. (NASA photo by Lee Jones)

AEDC played vital role in space shuttle development

By Patrick Ary
Aerospace Testing Alliance

The last space shuttle launch is set for early July. Bill Peters remembers the first.

"Probably the first 50 ... I watched about every one of those either live if I could, or I would record them," said Peters, the Aerodynamics and Propulsion Section manager for ATA. "Many of us engineers in the wind tunnel area were glued to the set."

They had good reason to be, because they played a major role in getting the shuttle into space.

While the shuttle is a NASA program, the space agency relied heavily on AEDC during development in the decade before it lifted off for its first manned mission. In 1972 – the same year that Peters arrived at AEDC – shuttle development and testing was getting underway in earnest.

The first AEDC tests under the space shuttle name took place

in 1970 on a stage-and-a-half concept developed by Chrysler Corporation. A year later, North American Rockwell tested a model. Also in 1971, aerodynamic tests were conducted on the complete shuttle vehicles proposed by the two principal contenders: McDonnell Douglas/Martin Marietta and North American Rockwell/General Dynamics.

AEDC workers were determined to gather data that would give NASA the means to develop a vehicle that would fly and keep astronauts safe – by using tools much less advanced than today's technology.

"In the early days, the computer systems we utilized were much more primitive," Peters said. "We were in the late days of the Apollo program, and sophistication of much of the electronic equipment was much less technical than it is now. So the process for testing was more hands-on ... we used a lot of slide rules. Hand calculators

were not even in place until about the middle 70s, so it was a lot of pencil and paper."

Several designs were tested – some of which barely resemble the vehicle the shuttle eventually became.

"Initially it was going to be a two-part vehicle that was flown back," Peters said. "Not only the orbiter; the external tank was going to be flown back and retrieved, so the early concepts were two-winged bodies. We had done some of that initial testing. It wasn't too long after that they narrowed down, because of cost and effectiveness, they chose not to have the external tank as a flyback configuration."

In the early days, every wind tunnel on base was being used to conduct testing, Peters said. Aerodynamic forces and pressures and heat transfer data were gathered to help determine the right con-

See SHUTTLE, page 4

Newest AEDC Fellows



Three new AEDC Fellows and two new Lifetime Achievement Fellows were inducted at the annual AEDC Fellows Banquet June 24. Recognized as Fellows were Dr. Ronald L. Clouse, James H. Nichols and Edgar Wantland and the Lifetime Achievement Fellows were William G. Gray and Jim Patterson. Pictured, from left to right, are Clouse, Gray, Nichols, Wantland and Patterson. (Photo by Rick Goodfriend)



At the time, one matter of interest both to the present and the future space shuttle designers was determining the pressures and temperatures the orbiter and booster would be subjected to through the interaction of their shock waves. A series of tests were conducted to measure temperatures and pressures for comparison with analytical results. After a series of tests using very simple forms to represent a booster paired with an orbiter, data were taken with the hypothetical orbiter-booster combination shown here. The effort was sponsored by the Air Force Flight Dynamics Laboratory and was conducted for Grumman Aircraft by Arnold Research Organization (ARO), Inc., AEDC's operating contractor at the time. Checking adjustment of the models is test facility craftsman R. G. Rainey. (AEDC file photo)

HIGH MACH

Arnold Engineering Development Center
An Air Force Materiel Command Test Center

Col. Michael Panarisi
Commander

Jason Austin
Director,
Public Affairs



Steve Pearson
General Manager,
Aerospace Testing Alliance

High Mach Staff:
Kathy Gattis, ATA Public Affairs Manager & Executive Editor
Darbie Sizemore, Editor Information International Associates, Inc., Production

High Mach is published by *The Tullahoma News*, a private firm in no way connected with the U.S. Air Force, Arnold Engineering Development Center (AEDC) or Aerospace Testing Alliance (ATA), under exclusive written contract with ATA, center support contractor, at Air Force Materiel Command's AEDC, Arnold AFB, Tenn., 37389.

Everything advertised in this publication will be made available for purchase, use or patronage without regard to race, color, religion, sex, national origin, age, marital status, physical handicap, political affiliation or any other non-merit factor of the purchaser, user or patron.

The *High Mach* office is located at 100 Kindel Drive, Suite B212, Arnold AFB, Tenn. 37389-2212. Editorial content is edited and prepared by AEDC support contractor ATA. Deadline for copy is Wednesday at close of business the week before publication.

This commercial enterprise newspaper is an allowable ATA contractor publication for personnel at AEDC.

The content of *High Mach* does not necessarily reflect the views of the Air Force, AEDC or ATA. The appearance of advertising in this publication does not constitute endorsement by the Department of Defense, the Department of the Air Force, AEDC, ATA or *The Tullahoma News* of the products or services advertised.

For advertising information, call (931) 455-4545.

For general information about *High Mach*, call (931) 454-5617 or visit www.arnold.af.mil.

The center's vision: AEDC as the test center of choice, the workplace of choice for our people and a model of environmental excellence.



Vision

"ATA will be a trusted partner in delivering best value warfighter support and assert stewardship to AEDC"

Core Values

- Be accountable for our own actions
- Ensure the safety of individuals and equipment
- Demonstrate the highest integrity and ethical standards
- Communicate clearly and openly
- Deliver professional and technical excellence
- Nurture, enable and treat people fairly
- Align with customer goals and objectives
- Use disciplined and innovative processes
- Continually improve in all that we do



Core Values

- Integrity first
- Service before self
- Excellence in all we do

Special Opportunities

Celebrate Independence Day and AEDC's 60th anniversary

By Col. Michael Panarisi
AEDC Commander

This weekend, we will celebrate perhaps the most significant milestone in our nation's history ... our Declaration of Independence.

This is right on the heels of our own celebration of six decades as the world's leader in our mission here at AEDC.

These certainly call for a special event, and today we are honored to partner with the Tullahoma Kiwanis as they host the annual 4th of July Celebration and Air Show at the Tullahoma Airport.

This year, the celebration begins at 3 p.m. today and includes a variety of aerospace displays, (including a 60th Anniversary



Panarisi

of AEDC Booth sponsored by our Company Grade Officer Council), aircraft static displays and a number of aerial events, headlined by the Air Force A-10 demonstration.

Fireworks will start around 9 p.m.

All in all, it promises to be a fantastic event, and one made possible by the hard work and dedication

of the event planners and volunteers ... but more importantly, in part by the decades of service rendered by team AEDC.

President Ronald Reagan stated "Freedom is never more than one generation from extinction. We didn't pass it to our children ... it must be fought for, protected and handed on to them to do the same."

The founders of our country did exactly that, and we bear an enormous responsibility to sustain the nation they created.

Team AEDC can be justly proud of the contributions you have made in this effort.

While our country celebrates "independence," we cannot forget the sacrifices of those uncounted millions who have

served the call of a nation, in peace and in war, at home and abroad, first to establish, and then build a nation that embraces freedom.

Counted among them are the men and women who have called AEDC "home" and forged an Air Force living up to Gen. Henry "Hap" Arnold's vision of "an Air Force second to none."

I hope you will join us this at this fantastic event, as well as our own "60th Celebration" July 8.

And along the way, please take a moment to remember and thank all those who have made these celebrations possible.

Our nation has faced many difficult periods, and while we deal with our current challenges, we

need to keep everything in perspective and recall the force that put our country on the map ... the unending call for freedom.

This has not receded and has stood the test of invaders, wars and catastrophes of unthinkable proportions, both on our own turf, and on those of our trusted allies.

This weekend, we celebrate the founding of a nation forged by a vision we all now call our own.

It's ours to protect, defend, and preserve.

In this effort, we cannot and will not fail. That's the spirit that guided Founding Fathers, and I'm honored to be part of the historic achievements at AEDC, where we've proven time and time again, it's our spirit too!

Action Line

Team AEDC

I believe in free and open communications with our Team AEDC employees, and that's why we have the Action Line available. People can use the Action Line to clear up rumors, ask questions, suggest ideas on improvements, enter complaints or get other issues off their chests. They can access the Action Line in one of three ways: via the AEDC intranet home page, Action Line boxes at the base cafeterias and by calling 454-6000.

Although the Action Line is always available, the best and fastest way to get things resolved is by using your chain of command or by contacting the organization directly involved. I encourage everyone to go that route first, then if the situation isn't made right, give us a chance.

Col. Michael Panarisi
AEDC Commander

Founding fathers' ideals of independence upheld today

By Gen. Donald Hoffman

Commander, Air Force Materiel Command

WRIGHT-PATTERSON AFB, Ohio – We all enjoy a great many freedoms. Over the July 4th weekend, many of us will get together for a cookout or to watch fireworks with friends and family as we celebrate our nation's 235th birthday. While we certainly look forward to those activities, we should also use the holiday as an opportunity to reflect on exactly why it is we're able to celebrate.

Historians tell us the men who signed the Declaration of Independence did not foresee the document's ultimate significance to future generations. The Continental Congress actually had more pressing concerns – the nation's founders knew their signatures would be their death sentences if the American Revolution failed.

However, we have not maintained our independence on the courageousness of our forefathers alone. Since 1776, thousands of Americans have given their lives in service to our nation, and millions more have put their lives at risk to preserve our democratic way of life and our individual freedom.

Air Force Materiel Command is a key part of this service. We support democracy and uphold the ideals of our predecessors when we provide our nation's warfighters with the resources they need to win.

So enjoy July 4th festivities as you celebrate this special time for remembrance and patriotism. Be safe, and be proud that, thanks to you, America remains free and independent – the land of "Life, Liberty and the pursuit of Happiness."

Happy Birthday, America!

How sharp is your saw?

By Lt. Col. Michael Millward

344th Air Refueling Squadron

MCCONNELL AFB, Kan. (AFNS) – As members of the United States military, we are busy. I know I didn't need to tell you that, but we all know it's true. We are fighting three different wars and trying to aid as many allies as we can while also being downsized.

When demands are placed on our time, we have to prioritize what we will accomplish in the time allotted. When we are busy, it's very easy to neglect taking care of ourselves, but if we neglect ourselves, our health, or relationships with our family and friends, our job performance will inevitably suffer. We cannot effectively care for and serve others and our great country if our lives are off balance.

If a carpenter wants to build something, he needs to ensure his carpentry tools are in good shape. They must be clean and sharp to be effective. The carpenter has to put time and effort into ensuring his tools are ready for the task ahead. Likewise, we must put time and effort into ensuring we are ready for our tasks. Dr. Stephen Covey, author of "Seven Habits of Highly Effective People," calls this "Sharpening the Saw."

Dr. Covey discusses four areas into which we must invest our time and effort to ensure we are effective. These areas are: physical, spiritual, social/emotional and mental.

As you've no doubt noticed, our Air Force leaders have placed much more emphasis on physical fitness now than in the past.

Why?

When we are fit physically, we are more able to perform in stressful situations, and we can work harder for a longer amount of time. We can think more clearly and make better decisions. If on the battlefield, we can carry ourselves and our equipment more easily. In the long term, it will help us avoid a slew of illnesses which can result in disability or death. All these factors make it clear that physical fitness is of utmost importance to us and to the Air Force.

Spiritual health gives us a moral compass, so we can make decisions based on correct principles. If you are active in a religion, you should allow time for prayer and scripture study. You must take time for meditation and introspection.

Believe me when I tell you I know how difficult this can be especially when we're busy, but I believe the times when we're most busy are when we need to tend to our spiritual health the most.

We, as human beings, fill our emotional needs by interacting with other human beings. There is no substitute for face-to-face social interaction. Spending too much time by ourselves upsets our emotional balance. We need to connect with our friends and family on a regular basis to re-establish that balance.

Col. Jamie Crowhurst, the former 22nd Air Refueling Wing commander, emphasized that we as Airmen need to be innovators. We need to sharpen our minds to accomplish this. We need to expose our minds to new and different ideas and concepts, so we can aggrandize upon them and become more innovative. This is why the Air Force expends so much time and money into education within its ranks.

We should "Sharpen the Saw," or spend time and energy in all of these areas on a daily basis. Taking care of our physical, spiritual, social/emotional and mental needs will allow us to be more effective and will ultimately lead to a more effective Air Force. This is essential to maintaining our personal and professional viability in an ever-changing world.

Since You Know

Last issue's answer:

The work was completed on PWT's tunnel 16T in 1955.

Thanks to all who participated in our "Since You Know" contest.

Last issue's winners:

Thomas Dimon

James Gilliam

Gail Bryant

Smoking Policy

- The following revised AEDC smoking policy is effective immediately. Smoking is permitted solely in designated areas identified by a plastic "smoke genie." This receptacle is for the sole purpose of cigarette butt disposal. If there is no receptacle, you cannot smoke in that area. It is the responsibility of all smokers to clean up the area surrounding the receptacles for any cigarette butts on the ground. Smoking in government-owned vehicles is strictly prohibited. Personnel are allowed to smoke in their personal vehicles at any time. In case of inclement or cold weather, employees are encouraged to use their personal vehicles if a sheltered designated smoking area is not available nearby. Smoking areas will be held to the absolute minimum and will be located in low traffic, low visibility areas away from points of building ingress/egress and air intakes. A map of all authorized smoking areas is available on the AEDC web portal at [https://lpapro.arnold.af.mil/PORTALimages/Smoking area map. pdf](https://lpapro.arnold.af.mil/PORTALimages/Smoking%20area%20map.pdf). Smoking near a facility in an area not designated on the map is prohibited and any smoking receptacles located in areas not shown on the map will be removed. All "smoking permitted" and "no smoking" signs will be removed unless specifically required by OSHA.
- The fact a person smokes has no bearing on the number of breaks they may take. Breaks should be taken in accordance with the company/agency personnel policies that apply to all employees.
- Regarding use of smokeless tobacco, containers of tobacco waste product, including sealed containers, must not be left unattended or disposed of in trash receptacles. Users of smokeless tobacco must flush tobacco waste down the toilet. Smokeless is strictly prohibited in conference room meetings and other areas, e.g. PMEL, where Air Force regulations specifically prohibit.
- Supervisors at every level will ensure this policy is followed. Disciplinary action is appropriate for repeated violations.
- Updates to this policy will be made in the future to further align with Air Force guidelines.
- This letter supersedes previous letter dated 28 October 2006, subject as above.

DOE introductory class held for engineers

By Philip Lorenz III
Aerospace Testing Alliance

AEDC recently held a two-day design of experiments (DOE) introductory course at the University of Tennessee Space Institute (UTSI) for 20 of the center's engineers.

Jerry Kitchen, technical director for the Science of Test Engineering and Technical Management Office, said this course was the next logical step in bringing AEDC's engineering work force up to speed on the statistics' based approach to ground testing.

AEDC hosted the first DOE introductory course in 2008.

Kitchen and Michael Schlieder, AEDC's director of engineering and technical management, initiated the course and enlisted Dr. Jim Wisnoski as the instructor. Dr. Wisnoski, a principal consultant at Adsurgo, LLC, in Denver, retired from the Air Force after 20 years in various roles conducting, training and leading analytical efforts for the Air Force Operational Test and Evaluation Center, USAF Academy, Air Education and Training Center and the Joint Staff.

"The Design of Experiments short course provided was out of AFMC funding for the Science of Test through the Air Force Institute of Technology Center for Operational Analysis whereby the Air Force is using a variety

of analytical methods to improve test throughout the lifecycle of weapon systems," he said. "Mr. Greg Hutto teaches similar courses primarily at Eglin AFB with Dr. Jim Simpson. These two individuals are widely recognized as top design of experiments practitioners in the Department of Defense."

Jeremy Morris, an ATA project engineer, said he didn't hesitate when his manager suggested he attend the DOE seminar.

Morris, a former General Electric (GE) Aircraft Engines employee, said he was convinced of the importance of DOE's principles early in his career.

"Many of the Six Sigma processes adhered to at GE go hand-in-hand with DOE," he said.

"As a person actively involved in propulsion test planning and execution, I hoped the course would provide some new techniques to maximize efficiency while providing higher fidelity test results to our sponsor."

Tyler Neale, a test project manager at the Propulsion Wind Tunnel Ground Test Complex, said the decision to take the class made sense.

"I attended the class to get a brief background and overall understanding of DOE and how it can be applied on the job," he said. "DOE has the potential to allow testers to realize substantial savings in both time and money.



Jerry Kitchen, technical director for the Science of Test Engineering and Technical Management Office, provides opening remarks and introduces the class to the instructor of AEDC's second DOE introductory course, held at the University of Tennessee Space Institute. (Photo by Philip Lorenz III)

In today's world of demanding efficiency, DOE could be used to reduce spending on testing while still obtaining a sufficient and necessary amount of data.

"However, based on my limited knowledge of DOE processes, I do see limitations with applying this technique to wind tunnel testing in particular. Changing flow conditions – Mach number, humidity, density, etc. – across a large spectrum frequently to obtain the test points determined through DOE processes may not be efficient. The lower number of test points may be offset by the higher cost of constantly

changing conditions. Nevertheless, I do think sufficient up-front planning could help mitigate this limitation."

Dr. Wisnoski led the students in a practical demonstration of DOE on the second day.

"The paper helicopter experiment was an outstanding way to quickly see how DOE can be confidently applied to a test," Neale said. "While this was a very simple and rudimentary test, the underlying principles that can be applied to real-world testing were certainly seen. It is always useful to see something hands-on to supplement a lecture."

AEDC police, OSI agents help out at Bonnaroo

By Shawn Jacobs
Aerospace Testing Alliance

AEDC personnel worked in various ways to help the Bonnaroo Music and Arts Festival June 8-12 run smoothly, with minimal impact to the base.

The Arnold Police Department aided in traffic control, the Air Force Office of Special Investigation (OSI) worked the festival and AEDC Fire and Emergency Medical Services (EMS) were at the ready in case they were needed to provide mutual aid assistance to the festival.

AEDC Fire Chief Daryle Lopes said his department logged no calls to the event, but a number of off-duty AEDC firefighters volunteered to assist in firefighting operations at Bonnaroo.

OSI agents actually patrolled the festival grounds.

"We supported the Air Force's counter drug strategy by working closely with the 14th Judicial Drug Task Force and Coffee County Sheriff's Department," said Rob Redmon, special agent in charge of the Arnold AFB OSI. "We also monitored this event as a mass gathering event close to Air Force property for anti-terrorism issues."

As in previous years, Arnold Police helped with traffic control at the Interstate exit nearest AEDC.

"We helped with [Interstate] exit 117," said Lt. Kevin Syler, who is events coordinator for the Arnold Police Department. "Of course, that's the base's exit, so we're there to assist local traffic and the base populous."

He said a change in the times vehicles were allowed to enter the Bonnaroo site helped traffic run smoothly, and it was a mostly uneventful year from a traffic standpoint.

"This is the slickest year I've ever seen," Syler said. "If they do it like this next year, it will be good. The Highway Patrol was superb, and the TDOT [Tennessee Department of Transportation] Roadside Assistance vehicles gave us a lot of information about what was going on in other places."

"Most of the people going to Bonnaroo are just really nice. Some of them are really lost; some of them don't understand the instructions they've gotten off the website or that have been sent to them in their package. They'll do whatever



Alison Krauss and Union Station featuring Jerry Douglas performed June 11 at Bonnaroo. They were just one of many acts who played to thousands during the four-day festival. (Photo provided)

they can or whatever they think they can get by with, but it's not malicious and I'd say 95 percent of them adhere to the instructions really well."

Coffee County Mayor David Pennington was grateful for the support provided by AEDC.

"We have maintained a great working relationship with all emergency service personnel at AEDC, and they are to be commended for their support efforts, not only

during the Bonnaroo Music Festival, but throughout the year for their support efforts whenever called upon to assist the county," Pennington said.

Coffee County Emergency Management Agency Supervisor Allen Lendley also expressed his thanks to AEDC.

"Emergency Management asked them [AEDC] to power up their UTAC [UHF Tactical Channel] 41 repeater (Emergency Management

channel) to assist with Command and Control coverage in the area of Bonnaroo," Lendley said. "This is the second year they have supported us in this aspect. We continued to maintain communications and coordination with AEDC before, during and after the event."

Lendley also thanked Arnold Police for their help with traffic control and the AEDC off-duty firefighters who volunteered on site.

Know what USB devices are allowed in computers

The Universal Serial Bus (USB) is an industry standard which defines the cables, connectors and protocols used for connection, communication and power supply between computers and other electronic devices.

Designed to standardize the connection of computer peripherals such as mice, keyboards, digital cameras, printers, portable media players, disk drives and network adapters to personal computers, USB devices facilitate communication and provide a power source.

It has also become commonplace to find a USB on other devices such as smartphones, personal data assistants (PDA) and video game consoles.

"USB has effectively replaced a variety of earlier interfaces such as serial and parallel ports, as well as separate power chargers for portable devices," said Theresa Cates, branch manager of the ATA Enterprise Computing and Communications. "As of 2008, there were about two billion USB devices sold per year. Due to the flexibility and ease of connecting computer peripherals to our comput-

ers, the use of USB connections is commonplace in our home and many of our work computers but there are some restrictions that we must remember."

Some USB devices are allowed to be connected to an Arnold Unclassified Network (AUNet)-NIPRNet attached computer, while other USB devices are not.

"These rules apply for any AUNet computer whether connected at all times or not," Cates said. "Once a computer

connects to AUNet, the rules apply – period. The best advice is if you don't know if something can be connected to your computer, ask."

While the chart below shows some of the more common USB devices which may be connected to a government computer, it is not an all inclusive list.

If in doubt about connecting any device to an USB port on a government system, contact the NCC Help Desk 454-4040 option 1.

Peripheral	Allowed or Not	Comments
Government-owned USB external hard drive	Allowed	Authorized by IA office
Government-owned mouse, keyboard, printer	Allowed	Authorized by IA office
Personally-owned USB external hard drive – used at home	Not Allowed	No personally owned media or device allowed on NIPRNet.
Government-owned USB thumb drive or flash drive	Not Allowed	Banned in Nov 2008
Personally-owned cell phone, smart phone, MP3, iPods, etc for charging	Not Allowed	No personally owned media or device allowed on NIPRNet.
Government- or ATA-provided cell phone or smart phone for charging	Not Allowed	It doesn't matter if it is for downloading or power charging.
Camera	Limitations	Each individual camera must be analyzed by NCC

BRIEFS

Goose control efforts underway

It's that time of year again when seemingly every goose in the county has congregated on Arnold AFB.

Geese love being near water, and if there's one thing that Arnold has plenty of, it's water. While geese may be beautiful and majestic birds, they can be quite a nuisance in large numbers.

Not only can they become aggressive; they also leave disagreeable droppings on beaches, lawns, sidewalks and parking areas.

Since 2003 Arnold AFB has contracted with USDA Wildlife Services to control the goose population on base. During the coming summer months, Wildlife Services will be working on base to continue this effort in order to keep the goose population at an acceptable level.

From mid-June into July, geese "molt" or shed their old feathers and are unable to fly, making them easier to capture.

Once captured, the geese will be relocated to sites approved by the Tennessee Wildlife Resources Agency.

During August, after the molting season and before the beginning of the goose-hunting season Sept. 1, Wildlife Services will use a combination of pyrotechnics and distress tapes to harass any geese that are not captured during the molt or that fly into Arnold AFB after the molt.

The goal of the harassment will be to keep geese out of the Security Area and off the beaches on Woods Reservoir.

If you should observe Wildlife Services in the field, please do not disturb them. Your presence may alarm any geese they are working at the time and disrupt the capture process.

Basewide 60th picnic is July 8

In honor of the 60th Anniversary of AEDC there will be three special events held July 7-8.

A four-person golf scramble will begin at 1 p.m. July 7 at Arnold Golf Course with a shotgun start at 1 p.m. Cost is \$17 per person and includes greens fee and cart.

Call 454-GOLF to sign up as individual or team.

The following morning, July 8, will be a 5K Fun Run/Walk at 8 a.m. The start will be at the Fitness Center trail and the finish will be at the track behind the A&E Building. The first 50 to sign up for this event will receive a commemorative event T-shirt.

Contact the Fitness Center at 454-6440 to sign up for this event.

The main event will be a free picnic for all AEDC employees from 10:30 a.m.-2:30 p.m. July 8.

The picnic will be at the grassy area between the A&E and Carroll buildings. In the event of inclement weather, the picnic will be moved to the Arnold Lakeside Center.

Due to limited parking, shuttle service will be provided throughout the base. The pickup schedule will be posted on Sharepoint.

Barbecue sandwiches, cole slaw, baked beans, chips, cookies and drinks will be served.

While at the picnic, visit the Services display and register for prize drawings. You do not have to be present to win.

For further information on any of these events call 454-3128.

New cameras make image capture easier at AEDC ballistics range

By Patrick Ary
Aerospace Testing Alliance

Until recently, getting new parts for the laser camera system at AEDC's Hypervelocity Ballistic Range G was a lot like antique shopping.

In a time when it's hard to buy a new camera that isn't digital, workers at Range G have been stretching their resources to keep their film-based camera equipment viable.

But now, after six years of planning, they have a new digital system in place that brings them into the 21st century and makes the process of capturing high-velocity images a more amicable process for both them and the base's test customers.

The new system is more of a necessity than a luxury, according to instrumentation engineer Ed Erickson.

"The cameras had been around about 40 years, and the system as it existed up until now was around about 20 years," Erickson said. "Needless to say, spare parts aren't available for it anymore."

Range G is used to conduct kinetic energy lethality and impact phenomenology tests. Its two-stage gas-gun launcher is the largest in the United States, firing projectiles down a 930-foot-long instrumented tank.

Impact testing and examining aerodynamic features of projectiles are primary functions of the tunnel, and having a camera capable of capturing an image as the projectile flies by is important.

Erickson started looking for funding to put a new system in place in 2005 – which was the last chance he had to get spare parts for the old system. The man who made illumination lamps for the laser system was retiring, so he stocked up with as many lamps as he could get.

The old camera system was a box-shaped film camera. Because

projectiles fired through the tank travel as fast as 18,000 feet per second – six times faster than a bullet – a flashbulb isn't capable of illuminating the tunnel for a photo. A laser is used instead.

The old cameras' laser systems used a ruby laser that sat inside a custom high-intensity lamp, which had a water cooling system and a 20,000 volt power supply. The old rig was the size of a steamer trunk and because of the way it was built, a series of mirrors had to reflect the laser beam from one side of the box into the tank. If a customer wanted a photograph from a different section of the tank, it could take a full day to reposition the camera.

The ruby laser used in the system isn't available anymore, and there's only one place left selling the image intensifiers used in the camera to get a sharper image.

The new systems are "everything we need in a compact package," according to Erickson. One camera and laser system is about the size of a briefcase, with the laser capable of firing directly into the tank. If it needs to be moved, the new system can be repositioned and ready to go in about two hours.

"Before, I'd tell Ed or some of the other folks I wanted to move the laser camera," said project engineer David Woods. "They'd look down and they'd just start shaking their heads. Now it's not so bad."

The new digital imaging system is also much faster than the film system, according to Erickson. They have a photo of the projectile upstairs from the range as soon as the camera snaps the picture and stores it. It's instant viewing as opposed to waiting for the chance to go into the facility and physically retrieve the film.

"When they fire the launcher, carbon monoxide



A successful checkout test June 8 at AEDC's Hypervelocity Ballistics Range G captured this image of a projectile traveling at 18,000 feet per second. New cameras installed at the range use a digital format to capture images that are used to determine aerodynamic performance. (Photo provided)

is generated," Erickson said. "Hydrogen could leak out of the tank. They have to take steps to purge the tank and make the downstairs safe for a person to re-enter. So it takes about an hour and a half to two hours before the service tunnel is ready for entry. And then it would take another half hour to develop the film."

Woods likes another aspect of the digital system: it gets rid of the possibility that the film could be accidentally dropped or exposed to

light, destroying the data.

"The thing I like about this system is as soon as it's done, it immediately gets transferred into memory and saved, and we don't have to worry about what happens if there are extenuating circumstances," he said. "We have our data."

The range cameras are ready to go; a final checkout confirmed readiness June 8. A customer test is lined up for October. By then, Range G workers may be able to use the equipment they have to measure the

SHUTTLE from page 1

duct testing, Peters said. Aerodynamic forces and pressures and heat transfer data were gathered to help determine the right construction materials and establish baseline flight models for the ascent portion of the mission. AEDC also conducted separation tests for the solid rocket boosters and external tank.

"We have generated data in our wind tunnels for NASA to use for most portions of the flight database to assist in making space access safe, reliable and efficient with that vehicle," Peters said. "Even though a lot of the needed data were acquired at NASA facilities, we were a key part of providing information they could not get in their facilities."

All of that work cul-

minated with the launch of Columbia in 1981; a launch that Peters said gave him a feeling that mankind was on a new quest.

"I think everybody felt very fortunate that they had been a part or could be a part of contributing to the success of such an advancement in our space program," Peters said. "Even though we are not a direct part of NASA, we feel a strong kinship to the fact that we have a similar mission in terms of NASA putting flight vehicles into space and to assist advancing technology in the field of aeronautics."

Refining work has been conducted throughout the remaining years of the shuttle's life as NASA has come back to AEDC to test everything from the shuttle's main engine to thermal tiles. Peters said he had no idea when they started work on the program that it would last so



Three new laser camera systems have been installed at AEDC's Hypervelocity Ballistics Range G. The new systems capture digital images of projectiles traveling at high speeds. A laser mounted at the top of the system illuminates the tank while a camera on the bottom captures the image. The new cameras replace film systems that were decades old. (Photo provided)

attitude and positions of a projectile within a 3-D volume.

"I expect that as we continue to move forward with using these things on our test shots, we will continue to improve,"

Woods said. "These images are pretty good but there are some things

I'd like to see more clearly, and that's just the sort of thing that's going to come with time as we continue to use the systems."



NASA representative John Warmbrod, left; ARO project engineer R.K. Matthews, center, and Air Force representative to VKF, Maj. R.W. Working, examine the vast amount of data produced in the heat transfer phase of the test programs. Similar amounts were produced in the other phases. (AEDC file photo)

long, but he's proud of the work that has been done to keep it flying.

And he's looking forward to whatever comes next.

"I think that the heart of man – the heart of us – is for exploration," he said. "I think we have something built within us to explore. I think that's that's a part of who we

are. That's a part of how we settled this country. So I feel we have a heart for it that's not going to be extinguished regardless of the budgets on the national level or even the technical difficulties we face.

"We are experimenters. We are developers, and we will reach and go and do. We're not at the end point. We're still at the beginning."

REMOTES from page 1

use; in 1984 we were still using it essentially as a vacuum source for putting smaller supersonic nozzles in place to do technology development.

"The predecessors, being Tunnel 1 and 2, existed for a very similar purpose to the facilities that exist in Tullahoma today. The beginning of high speed and really aeronautic technology was just being understood, with the aid of the German scientists that came over to help us develop and start that program. So that history is very similar in that we were looking at this technology that really was unknown to us and trying to understand its benefit."

In those early years, Marren was part of a team focused on conducting aerodynamic research on bombs and, later, testing on the weapon systems like Sidewinder missiles. However, it wasn't long before his attention turned almost entirely to advancing the study of hypersonics.

"Even back in 1984, I was working more toward the Tunnel 9 effort than I was on the old tunnel efforts," he said. "Most of what I was doing was focused on things like re-entry and strategic systems, like Intercontinental and Submarine-Launched Ballistic Missiles [(ICBM), (SLBMs).]"

Marren said the level of testing "was actually quite active" his first year at Tunnel 9.

He recalled that Tunnel 9's team was also doing a lot of their work at AEDC.

"We were half way through some of the major Navy programs that were going on like the upgrades to the Navy [Trident fleet ballistic missile] MK4 and MK5 systems and the variants of those systems," he said. "We were actively testing in the AEDC arc heater facilities to get nose tip change shapes, and then we were looking at the aerodynamic and aerothermal qualities of those changed nose shapes that we got from AEDC in Tunnel 9.

"We were running 200 to 250 runs a year, which was keeping about 60 to 80 people here busy year-round, running all the facilities and the analysis that went with it."

Tunnel 9 is a blow-down facility capable of subjecting flight vehicles and component scale models to nitrogen gas at speeds as high as Mach 14 for up to 15 seconds.

Marren spoke about ground-breaking work done by scientists in the 1960s that led to the establishment of Tunnel 9 in 1975.

"They were looking at doing re-entry testing of full-scale re-entry and strategic systems as well as nose tips," he said. "The full simulation of what happens next to the body in the boundary layer became important.

"So, we started looking at higher pressure with tunnels, which can deliver the physics that occur in the boundary layer. So, they came up with a concept of building a tunnel which was to be Tunnel 9."

Ironically, the first funded program run in Tunnel 9 wasn't a Navy test, but an Air Force entry, on a boost glide maneuvering re-entry vehicle supporting the Advanced

Ballistic Reentry System (ABRES).

In 1997, Tunnel 9 came under the management of AEDC.

"Now we're doing boost glide systems, albeit at a different performance level in technology, but we're back to the future I guess," said Marren, who was the technical director when Tunnel 9 became a remote site managed by AEDC.

"Tunnel 9 is the highest pressure wind tunnel in the world. And the reason that it needs that high pressure is to develop the right physics in the boundary layer. When you're looking at what guides heat transfer into a heat shield, now what guides accuracy and control? It turns out to be what happens very close to the body and that's only discovered if you recreate the boundary layer.

He said Tunnel 9 can do this naturally through high pressure.

"Other facilities that we have around the world have to actually put a device on the test article to make the flow less smooth or laminar and turbulent," he explained. "When you do that sometimes you can corrupt the data if you don't do it carefully."

Marren said the work being done currently at Tunnel 9 falls into two main categories.

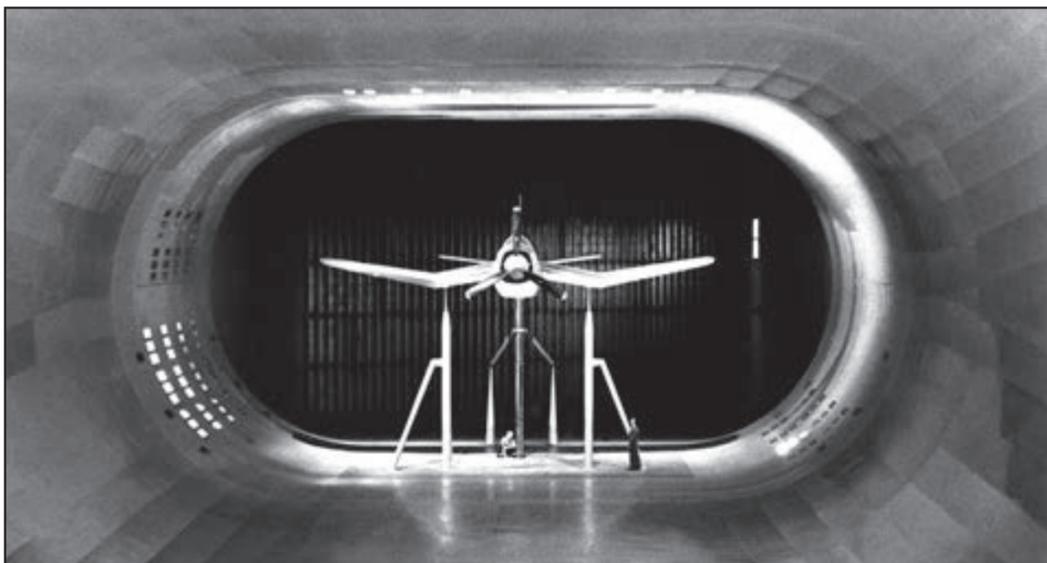
"The new classes of re-entry vehicles that trace their roots to the ABRES maneuvering re-entry or boost-glide systems of the 1970s are really where we're pushing the technology to help them get into the development stage. One of the first Conventional Prompt Global Strike (CPGS) program concepts is the hypersonic technology vehicle 2 (HTV-2). This is a joint U.S. Air Force and DARPA partnership, which will be handed over this year to the Air Force, and will form the basis for the Conventional Strike Missile.

"The other category, you'll see a very heavy emphasis in the arc jet facilities at AEDC and Tunnel 9 where we'll actually take nose tips that maybe are from a different vendor because the vendors that made the original nose tips are all out of business. And the looms are different, that gives you a different product and it might ablate differently.

"Those shape changes then need to be understood and programmed in to know how these things are going to fly, that might have been different than their design. Those are the standard U.S. Air Force ICBMs like Minuteman and the Navy Trident program and those are the systems that are in the field."

Marren said even slight modifications to a weapon system, like outer mould lines, will be made as the mission changes, which includes missile defense.

"Although they're not coming back from space, they're accelerating in the atmosphere at very high speeds," he said. "It is not uncommon for a rocket-boosted interceptor to fly between Mach 7 and 10. Those systems are going to experience the same sort of physics and challenges that our re-entry vehicles did to be able to understand their heat shields and their heat protection and of course their accuracy and control."



This Douglas XSB-2 model was the first aircraft to be tested in the NACA Ames 40-by-80-foot wind tunnel, the largest wind tunnel in the world at the time. Drag reduction studies were performed on the airplane. (NASA file photo)

National Full-Scale Aerodynamic Facility

In 1944, a Douglas XSB-2 model became the first aircraft to be tested in the NACA Ames 40-by-80-foot wind tunnel, the largest wind tunnel in the world at the time.

One highlight of earlier work done in the 40-by-80-foot wind tunnel was testing on the space shuttle conducted in the 1970s.

The work at NFAC following that test closely paralleled emerging threats and challenges AEDC met with its complimentary test capabilities and the hypersonic testing done by the facilities that evolved into Tunnel 9.

The facility became NFAC in 1987 after the 80-by-120 foot test section was added and other improvements made. This section is the world's largest wind tunnel and is capable of testing a full-size Boeing 737 at speeds up to 100 knots.

When the NFAC was deactivated in 2003, a large Army contingent and the rotary wing division of NASA Ames expressed their interest in keeping NFAC accessible and maintained to develop new and future rotor systems for rotorcraft. With help from people like AEDC Fellow Dr. James Mitchell and others, the Office of the Secretary of Defense was convinced that the NFAC was a valuable ground testing complex worth keeping viable.

The Air Force assumed responsibility for operations at the NFAC in February 2006, with AEDC conducting the 8 Meter Magnus Wind Turbine Test in February 2007.

NFAC is a unique fa-

cility, primarily used for determining aerodynamic characteristics of large and full-scale rotorcraft and powered-lift Vertical/Short Take-Off and Landing (V/STOL) aircraft, as well as testing of wind turbines, parachutes, trucks and other non-traditional types of testing.

Dave Duesterhaus, the director of NFAC, said the facilities complement AEDC's aeronautical capabilities. Having spent approximately 35 years at Arnold, primarily overseeing propulsion testing, he has had an opportunity to see ground testing from many perspectives.

"AEDC has had little involvement in rotorcraft development and only a few turboshaft engine tests that they've done over the years," he said. "The other thing is NFAC really bridges the gap from a subscale to full-scale because what NFAC allows you to do is [study] where you have aerodynamic interactions with aerostuctures."

He said at AEDC it might be possible to model aerodynamics and structures, but only separately.

"When you couple those two together, then it becomes too big of a problem to try to solve and you need a numerical simulator called NFAC where you can couple those two together," he said. "That is why rotorcraft [testing] plays such a big role in our customer base. Rotorcraft are highly affected by the aerodynamics and the structures together. And coupling those two together is really what makes this facility valuable."

Duesterhaus also spoke about some of the work on

testing Army helicopter rotors that began around 2009 and has continued to the present day.

"We just completed a series for the Army with a Sikorsky test, all involving active rotor systems with flaps on the rotor blades to effect and improve performance, either lift, cruise and noise reduction."

Duesterhaus said the upcoming testing at the NFAC will allow NASA to continue to take advantage of the facilities' unique capabilities.

"In the near term, we're actually going to look at some space decelerators for NASA in the next fiscal year," he said. "Those are called Hypersonic Inflatable Aerodynamic Decelerators (HIAD), and there's also a supersonic aerospace decelerators, but those are coming in maybe the next year or so."

Regarding what the future holds for them at NFAC, he said, "From NASA, we'll continue to get things like the parachutes and aerodynamic decelerators for any planetary expeditions that they might do or some Earth re-entry systems that they're looking at for satellites. We'll also probably have a role to play in whatever replaces the CEV, if there's an aerodynamic issues with those decelerators or parachute systems – we'll likely get involved with that."

Duesterhaus said, "We are also doing a short take-off and landing (STOL) airplane for NASA."

Other upcoming work will include aerodynamic testing on a smaller scale of an aircraft demonstrator like the Air Force Research Lab's Speed Agile

airliner.

"That will kind of be a technology development demonstrator," he said.

"The other big thing that we see for the future is the possibility of [testing] for NASA and the Army Joint Heavy Lift program applications of large tiltrotor test aircraft using the new \$20 million Tiltrotor Test Rig or the TTR. They're looking at 90-passenger short hop tiltrotor aircraft that would actually be very useful at places like upper northeast corridor primarily.

"Those aircraft could get to high speeds, similar to what they have with the V-22 [Osprey], up to 250 to 300 miles per hour, so it becomes a very viable commercial alternative to hub-and-spoke aircraft support, particularly in high density environments.

"At the same time, the Army is thinking that they want a large-built rotor or vertical lift platform for doing large entries into battlefield situations. Having those two requirements together, they jointly funded this tilt rotor test rig and that'll give us the capability to evaluate new concept for tiltrotor systems. One of the big things in rotorcraft has been active controls on the rotors; much like we did for the integral blade controller (IBC) and previously Boeing applied it on a technology demonstrator. So, those held great promise for future applications as well."

From subsonic to hypersonic, the additional capabilities provided by

NFAC and Tunnel 9 and their teams bring AEDC to the next level of aerospace ground testing in the world.

Petting zoo visits Camp Adventure

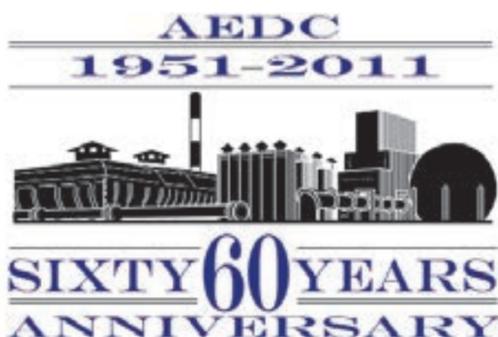


Teresa Hinds from Party Animal Inc. visited Camp Adventure June 23 with several different animals for the children to interact with. At left, Rachel Dent feeds a goat. Above, Kylee Stephens cuddles up with a pig; also pictured is Isha Upender. (Photos by Rick Goodfriend)



Putting a face on base history

The team in charge of preserving AEDC's legacy is looking to the future



By Philip Lorenz III
Aerospace Testing Alliance

Those who visit one section of Building 430 can see where a tremendous volume of one-of-a-kind documents representing 60 years of AEDC history is stored and undergoing processing.

Walk through the door and it is hard to miss an old, but well preserved vinyl gray arm chair. It's the same one that President Harry Truman sat in during his dedication of AEDC to General of the Air Force Henry Harley "Hap" Arnold in June 1951. Also prominently on display is an AGFA large-format view camera on a "portable stand."

It's a Rembrandt studio camera that was used by the base photo lab's staff in the 1950s to take portrait photos of Arnold's employees.

When Gwendolyn Hinson first walked through

that door as the archive assistant to AEDC Historian David Hiebert in January 2010, she didn't know what to think.

"It was overwhelming," said the 30-year Air Force reservist. "My first thought and question was, what is this chair doing here and what is the significance of it? So, I was told about the history of it and the same thing with the camera.

"Mr. Hiebert has been in this office for 24-25 years and he is a wealth of knowledge, so he began to tell me the story."

Hinson initially came to AEDC to fill a temporary position and later transitioned to a full-time government civilian as archive assistant.

Recalling her initial reaction when first walking into the History Office, she said, "I did not know



Gwendolyn Hinson, AEDC archive assistant, and David Hiebert, AEDC's historian, examine the Rembrandt studio camera that was used in the 1950s to take portrait photos of Arnold's employees. (Photo by Rick Goodfriend)

where to start. I am working with Mr. Hiebert to formulate a plan to make the History Office more user-friendly."

Hiebert, AEDC's historian since July 1987, said they first have to finish going through all of the documents to determine which were or could be cleared for release. Then, they have to determine which materials are worth saving.

Ironically, the Truman chair and the old portrait camera and other memorabilia don't qualify for archival safekeeping.

"We have Maj. Gen. Lee Gossick's uniforms for example, and they deserve a better display," Hiebert said.

General Gossick, a World War II veteran, was an AEDC commander,

AEDC Fellow and later served as deputy general manager for Sverdrup Technology, Inc.

Hiebert said a lot of work remains to be done, including a way to keep the memorabilia and put it on proper display on base.

"We're going through the complete body of archival documents that actually predate the center," he said. "They go back to the German work in places like Peenemunde and Berlin and have the German work on test facilities that they were doing during the war."

Hiebert and Hinson stay busy.

"We have in this office, on the magnitude of 500 requests for historical information a year," Hiebert said. "It is very, very difficult to keep up with these

sometimes. Some of the questions are ones we can answer off the top of our heads, such as what was the dedication date for AEDC. More often we have questions such as what was the construction date or date for a facility like Mark I and convert the cost into today's dollars.

"In addition to that we talk about the history of test and the history of the various types of organizations, such as service-funding, which was in the 1970s, or the true center concept which people don't really understand today."

Hiebert talked about the major challenge facing his two-person team.

"The challenge is that as we [AEDC] lose people through retirement, all of the corporate knowledge

that these people represent, leaves with them," he said. "The younger people, while they're extremely good technically, don't have the corporate background to see the challenge of the history/archives is to ensure there is a corporate memory in place to advise people that we've tried this before and these were the issues, advocacy issues, those kinds of things."

Hinson said she sees the task ahead of Hiebert and herself as fairly straightforward in some respects.

"Rome was not built in a day and I know that the History Office won't be the state of the arts that quickly either," she said. "The fact that there is a plan is a major accomplishment."

AEDC Technical Library hosts first lunch and learn

By Philip Lorenz III
Aerospace Testing Alliance

As part of the Technical Library's celebration of AEDC's 60th anniversary, Dr. Stan Powell discussed the "Mollier Diagram for Equilibrium Air," a 1967 chart assembled by Herbert Brahinsky and Don Northcutt (but representing the work of many scientists and engineers at AEDC and National Bureau of Standards).

The body of work on equilibrium gas properties done at AEDC in the 1960s was a critical enabler for hypersonic research. This chart was an important reference and visualization tool for a large part of the hypersonic flight regime for more than a generation.

Dr. Powell discussed the utility of the diagram, the work behind the diagram and its influence in the years after publication.

The idea for a lunch and learn at the Technical Library came out of a discussion between Fred Rascoe, the lead at AEDC's Technical Library, Fred Shope and Dr. Powell.

"Stan is a regular library customer, and he mentioned he had some extra copies of the Mollier Diagram for Equilibrium Air," Rascoe said. "The problem was that our copies were folded up and had been since 1967. Stan mentioned that these diagrams, important as they were, were in danger of being 'lost.'"

"So I decided to see what I could do to get one mounted. It took Wilsie [Ford] a lot of work to get it mounted without destroying it."

Rascoe said the library's two copies of the Mollier Diagram for Equilibrium



Dr. Stan Powell, an AEDC Fellow, speaks about the Mollier Diagram for Equilibrium Air, to a group of his peers during the first lunch and learn presentation held at Arnold's Technical Library. Dr. Powell's contributions to AEDC over the years include original modeling of combustion processes, modeling of thermodynamic and transport properties of test media and the assessment of combustion effects on test data with respect to simulation fidelity. His thermophysical developments and modeling capabilities have been critical components of AEDC's hypersonic, aeropropulsion and aerodynamic test processes. (Photo by Rick Goodfriend)

Air are not the only significant documents kept there.

"There are a lot of hidden gems like that in the AEDC Tech Library, representing work done over the past 60 years," he said. "The science gets expanded, modified, broadened, but many discoveries are as useful today as 40 years ago.

"As I've said before, it's interesting to think that smart engineers 60 years from now will be looking back at the work done today."

Paul Jalbert, ATA project engineer in flight systems, was among the 15 who attended the event.

"Stan is an excellent researcher and presenter," he said. "The small size of the audience was appropriate

for this topic. The coffee shop/book shop atmosphere was a pleasant change.

"There were no PowerPoint slides and the velum overlays on Stan's big charts helped make the point that the Mollier diagram approach requires 'hands-on.'"

Jalbert also enjoyed the presentation for other reasons.

"Except for the historical perspective on the contributors of the thermodynamic data used to construct the Mollier diagrams, I don't think any of us in attendance learned something really new as much as we were reminded about the foundations of the technology that we use every day at AEDC," he said. "That was the reason I attended this

particular lunch and learn. "We need to be reminded sometimes what is important and essential. Also, we need to share information about who is doing what, new methods, and of course, old friends."

Dr. Powell, who has been at AEDC more than 32 years, works in ATA's Technology and Analysis Branch in facilities and test techniques.

"Earlier this year, Fred Rascoe sent a request to some of the library's regular patrons soliciting suggestions for a list of the most significant publications as a part of the library's celebration of AEDC's 60th anniversary," he recalled. "My immediate response was the AEDC Mollier Diagram for Equilibrium Air,

1967. I have spent a part of the last four years working on a computer model of the Mollier Diagram for Equilibrium Air, so I was 'primed' for the question."

Dr. Powell said the lunch and learn provided an appropriate venue to discuss a valuable engineering tool and its place in the world's largest ground testing complex.

"AEDC is an incredible place," he said. "We are prospering today because of the very large number of very bright people who have contributed to AEDC for the last 60 years.

"That includes the design, construction, operation and maintenance of the physical assets and the intellectual assets. It is important to all of us to be

aware of our heritage and to be aware of AEDC's contribution to the military and civilian parts of the aerospace industry. The lunch and learn sessions with a strong history component like [the recent session] remind us of our heritage."

Dr. Powell said the subject of his presentation was a testimonial to many people and their work.

"The AEDC Mollier Diagram for Equilibrium Air is the result of a lot of good work by a lot of good, dedicated people, each doing their part, which resulted in a truly important result," he said. "The basic science was done mostly by the scientists at the National Bureau of Standards, [from reports authored by] Joseph Hilsenrath and Woolley, Hilsenrath and Charles Beckett, Hilsenrath and Max Klein, et al.

"The engineering that turned the basic science into a useful tool was done, mostly, at Arnold Engineering Development Center. The chart, prepared by Herb Brahinsky and Charlie Neel and others, is a great tool for visualizing a process etc., but it's a difficult medium with which to do calculations. The work by Martin Grabau, Brahinsky and others made the basic science amenable to machine (computer) calculations, thus allowing the science to be applied to real-world engineering problems."

Dr. Powell hopes that all of the engineers who attended the presentation gained from what he shared with them.

"AEDC is a very diverse place," he said. "No one can understand the details of

See LIBRARY, page ??



Readiness Center offers financial advice, assistance

By Shawn Jacobs
Aerospace Testing Alliance

Is it a need, or is it a want?

That is one question Autumn Standley, chief of AEDC's Airman and Family Readiness Center, might ask you if you visit her office due to financial problems.

"When you're in a situation where you don't have a lot of money to makes ends meet, do you need it or do you want it?" said Standley, who offers counseling and advice on budgeting to active duty military personnel through the Readiness Center as well as emergency financial assistance through the Air Force Aid Society. "[We help] people with emergencies [such as when] the car breaks down or they have an emergency and they need to go home, or they need rent, food, utilities, whatever the situation."

Standley said she has helped two Arnold families by providing advice on budget restructuring.

"They had really gotten themselves in a bind either due to a PCS [permanent change of station] move, due to divorce – different things kind of combined and hit them all at once," she said. "They got here and were struggling to make it paycheck to paycheck, so I sat down with them, looked at their budget, tried to figure out ways to manipulate the budget, talked to creditors to see if they would hold off on payment or on interest rates until we could get them on their feet."

One of the individuals was successful and has since gotten out of debt, according to Standley. The other person did not want to follow the plan Standley developed, so they failed to get back on track financially. She said if the problem is greater than she can deal with, her office can call in family life counselors.

Financial assistance is also available for military families who are faced with true emergencies.

"In two years, I've helped with things like rent, food, utility bills and car repairs," Standley said.

Still, Standley said, instances where the Readiness Center has to provide either counseling or financial assistance are fairly rare since there are only 52 military members stationed at Arnold, and most of them are either officers or senior noncommissioned officers.

"Most of my customers are actually people who were either on leave in the area, or in some cases I've got spouses whose husbands are deployed who have moved to this local area because Mom or Dad are close by or they've got some other family support system in the area," she said. "They [may be] living in their own apartment or still having to maintain a residence where they are stationed, and they still have the same bills that they had while they were together. It's just too much, so they need help sometimes."

The Airman and Family Readiness Center also sponsors classes conducted by a certified financial counselor from the Joint Family Support Assistance Program. The class, which is held about every other month, has featured topics like "Basic Investments," "What to Do if Your Budget's Not Working," "Thrift Saving Plan" and "Planning for Retirement."

Standley said the classes are of interest even to people who are not in financial trouble.

"As a matter of fact, we had 20 people attend "How to Develop a Spending Plan," she said. "We only have about 52 military members, so no matter what rank you are, you're sometimes wanting to figure out what is an effective spending plan and how do I set one up."

Standley generally sends out an e-mail to military personnel, notifying them of upcoming classes and how to sign up. She also sends out a newsletter for active duty spouses every four to six weeks and often includes financial tips.

She advises people to contact her before they get into true financial trouble.

"If they start seeing that they're robbing Peter to pay Paul then that's a big sign that they're in financial trouble," she said. "They need to come see me before they get so far into debt that they've got people calling them. If you're not making it from check to check, come see me before you get into debt and you possibly lose your security clearance because we don't want creditors calling the base."

For more information about services offered by the Airman and Family Readiness Center, call Standley at 454-4574 or e-mail grace.standley@arnold.af.mil. She is located in room B111 of the A&E Building.

Department of Defense (DOD) civilian employees can receive financial advice and other counseling through their Employee Assistance Program (EAP) provided by Federal Occupational Health (FOH) at www.foh4you.com or by calling the toll-free number 1-800-222-0364 or 1-888-262-7848 for hearing-impaired employees.

Stuck in a rut? Think Multi Sport

By Col. Michael Panarisi
AEDC Commander

Having just survived my first triathlon (our very own Mach Tenn!) I can tell you first hand that multi-sport training can totally transform your workouts and, more importantly, your results.

Good news is, you don't have to be an aspiring triathlete to benefit from the "secrets" of multi-sport training.

In fact, most fitness aficionados can actually take their game "to the next level" with just a few elements borrowed from the time-proven techniques developed for hard core competitors.

The beauty of multi-sport training is that you greatly reduce the risk of repetitive motion injuries.

Plus, if you manage to overdo it on one training element, you aren't sidelined ... you can just roll to a different one.

But the biggest benefit for those looking to improve or maintain overall fitness might be a little counterintuitive.

There is a HUGE psychological advantage in the variety of workouts. You just don't find yourself in that "here we go again" rut that so many runners, cyclists, swimmers or hardened elliptical warriors so often find themselves in.

Even more good news ... you don't actually have to be "any good" at any of the elements ... the benefits mount from the mechanics of workouts, not your proficiency, speed or efficiency at a competitive level.

A "standard" triathlon is

ATA offers help for troubled employees

By Philip Lorenz III
Aerospace Testing Alliance

With the recent recession, lingering high unemployment and future economic uncertainty, it isn't surprising that families everywhere are experiencing additional stress.

ATA's work force has a benefit program available to help them deal with these as well as the usual range of life's stressors faced by most individuals and their families.

"The benefits office can provide an employee [with] information on how to contact EAP (employee assistance program)," said Carrie Barham, ATA's senior benefits adviser. "The group [OptumHealth] provides them [with] general information on providers in their area who they can call if they want to see a psychologist or if they need to talk to somebody, they would provide them with the telephone number. EAP is a program that has many

so if you are envisioning endless laps and just thinking about it puts you off, don't worry, there's much more to it than a "jog in the pool."

Most training schedules start by emphasizing a specific event, then progress towards combinations (swim/bike, bike/run) with a few "all three" thrown in as a competition draws near.

But if you aren't expecting to compete in the near future, you can just stick to the "singles" and put together a regimen that will absolutely end any plateaus you might be suffering with on a more common workout routine.

The key to multi-sport is variety and, in fact, most coaches would recommend a different event every day, with the more challenging ones early in the week.

For most of us, that means the run comes first, and the swim towards the end.

But wait! What if you aren't a very good swimmer?

Oh contraire!

The "challenging" characterization refers more to the aerobic challenge than the degree of difficulty.

Though swimming is typically one of the least common workout skills, we can (and almost certainly should!) get help.

The Tullahoma, Winchester and Manchester pools offer adult classes, and you'll be very pleasantly surprised just how quickly you can pick up just enough technique to execute a very effective workout.

You might be surprised at just how little actual swimming you need to do.

A good portion of your workout will be drills (kick drills, "pulls" and "dips"),

components to it."

Mike Cunningham, ATA's human resources manager, said, "Through providers approved by OptumHealth, an employee or family member may receive counseling on substance abuse, financial and legal matters, depression and anxiety, parenting and family issues and relationship problems."

Barham said she has learned employees may not be aware of the range of benefits provided through OptumHealth.

"There [are] also a lot of components that a lot of people aren't aware of [like] articles on how to deal with adult daycare – when you're having to take care of a parent, how to find the appropriate care for them, adoptions, real estate, some basic legal questions. There's just a hodgepodge of things that people can go out there and look on the website for."

She said early intervention for people under stress

challenging aerobic and muscular workout on the same event.

Each event has its own benefits, with very little overlap.

Here's a starter schedule ... Monday – "sprint day" run; Tuesday elliptical/weights; Wednesday – bike; Thursday – swim/weights; Friday – "long day" run.

Of course, you can mix and match. The key here is endless possibilities, and LOTS of ways to string things together.

So if you find yourself looking for that "next big thing" to up your game, give multi-sport a try.

Who knows ... maybe we'll even see you on the Mach Tenn next year!

AEDC's work force can get nutritional counseling

By Philip Lorenz III
Aerospace Testing Alliance

According to current statistical data from the Centers for Disease Control (CDC), a major component of the Department of Health and Human Services, obesity continues to pose a serious health problem for people throughout the United States.

Dr. Rob Tessier, Comprehensive Occupational Resources (CORE) physician at the base dispensary, said obesity and diabetes are two health issues everyone affected should address in a proactive way and the associated problems are often preventable.

Dr. Tessier emphasized that even if someone is not obese, it doesn't mean their diet is adequately meeting

the body's requirements.

Fortunately, AEDC's employees don't have to go far to get answers and help with nutritional issues. Kristie Holt, a registered dietician and licensed dietitian nutritionist, is available to provide center employees with reliable nutritional information and dietary guidance.

"I am at the dispensary on the second Thursday of each month," said Holt, who has two degrees, one in health education and another in dietetics. "In March of 2009 I received continuing education credits through completing the Certificate of Training in Adult Weight Management Program. I undergo continuing education monthly

See NUTRITION, page 11

first five visits are free and if more are needed, our group insurance plans provide some assistance if the provider is covered within the insurance carrier's network."

Barham and Cunningham acknowledge that employees have expressed concerns about their privacy being protected.

"Confidentiality is very important to users and this is understandable," Cunningham said. "I can assure you nobody in this company ever knows who is using any of the services. The costs are pre-paid by the company and therefore billings are simply a flat fee per month for every employee on ATA's rolls."

ATA employees may access the EAP benefit by calling OptumHealth at 866-828-6049 or logging onto the company's website at www.liveandworkwell.com and entering access code 12610. For additional information, contact Carrie Barham at 454-7485.



Nutrition from page 10

on a number of topics, ranging from diabetes to vegetarianism to food related latex allergies with the dietitians from the Alvin C. York VA hospital.”

Holt’s approach is to begin with establishing a person’s current health status.

“I get some background information – diet and medical history – and we start from where we need to,” she said. “It’s good if they know their cholesterol numbers, if they’re diabetic, how their blood sugars are running – things like that. I like to have lab work, if they have that. It’s also good to come with a list of their medications.”

Holt said diabetes in particular has emerged as a health issue affecting more Americans than many people realize.

“Diabetes is absolutely the number one issue I see most often,” she acknowledged. “In most cases it is lifestyle that has led someone to this diagnosis, and the consequences can be life threatening if not controlled.”

“It is the American fast-paced, stressed, convenience and ‘want it now’ attitude that is responsible for our declining health. Because of this lifestyle, our bodies are lacking the basic nutrients to carry out essential functions leading to an array of diseases including cancers, fibromyalgia, heart disease and auto-immune diseases.”

She cautions her clients against following popular dietary trends that may not be appropriate or healthy choices.

“A current fad is extremely low calorie diets [of 500 calories],” she said. “I never recommend that a person consume less

than 1,200 calories a day. A thin person may not be healthy, and an obese person may be malnourished. It is the quality of food that nourishes our bodies.”

She said addressing diet alone is not the answer either.

“It is not the occasional piece of cake or cheeseburger that harms us, but a consistent lifestyle of choosing unhealthy foods and not moving our bodies,” she explained “Diet and exercise must work together. One cannot exercise their way out of a bad diet. It is easier to say ‘no’ to a doughnut than working out for an hour to burn off those calories. However, to lose two pounds per week, you need a 1000 calorie a day deficit. Instead of starving, one must exercise to get that extra calorie burn.”

To schedule an appointment with Holt, contact Susan Brewer at 454-4567.

Milestones



Thomas Cromer
ATA, 35 years



Tracy Donegan
ATA, 35 years

30 YEARS

Terrell Hand, ATA
Thomas Parrish, ATA
Brent Petry, ATA
Winfield Stacey, ATA
Joyce King, ATA
Timothy Holland, ATA
Mark Hood, ATA
Johnny Wilkinson, ATA
Edward Erickson, ATA
Richard Millen, ATA
Joseph Martin, ATA
Sharon Rigney, ATA
Marvin Sellers, ATA
William Bridges, AF

Richard Ferrebee, AF

25 YEARS

Stephen George, FRC
Wendell Miller, ATA
William Sloan, ATA
John Gilmer, ATA
Ronald Sparks, ATA
Donald Smith, ATA
Herman Holt II, ATA
Sarah Russell, ATA
Frank Roepke II, ATA
Russell Zarecor, ATA
Billy Tuck, ATA

20 YEARS

Stanley Coppinger, ATA
Teresa Montgomery, ATA
Sonia Gault, ATA
Richard Moore, ATA
Suzanne Singleton, ATA

15 YEARS

Ernest Hargis, ATA

10 YEARS

Maureen Burke, ATA
Stephen Lovett, ATA
Steven Luttrell, ATA
Jason Austin, AF

5 YEARS

Dexter King, Jr., ATA

Gregory Bateman, ATA
Rick Hutchings, ATA
Jason Waller, AF

NEW HIRES

Michael Walton, AF
Aleene Falk, AF
Jordan Panter, ATA

PROMOTIONS

Steven Pearson, ATA
Philip Stich, ATA
Christa Herron, ATA
Stanley Stepanek, ATA
Robert McAmis, ATA
Eric Mitchell, ATA

Library from page 9

everything that is going on here. Something like the lunch and learn gives the experienced engineers a chance to see what is happening, or more correctly, what has happened, outside their area of expertise.

“For the young engineers, the benefits are very different. Engineers come out of school with a good grasp of the science of engineering – the equations if you will. They have [a] very poor grasp of the art of engineering – how to apply the science to the real world.”

He was quick to point out that he was not criticizing the educational system.

“Four years of college is simply not enough time to learn the science and the art of engineering,” he explained. “Presentations of the development of something like the AEDC Mollier Diagram for Equilibrium Air give them a glimpse of how good

engineering is done.”

Dr. Powell said bringing seasoned engineers and the recent college graduates together is essential to advance the science and ‘art’ of engineering.

“It also puts them in contact with the people to whom they can turn if they have a question,” he said. “It is a small step in the teaching of the art of engineering.”

“I also hope that the presentation gave the young engineers some appreciation of the legacy of AEDC and of the standards that they will need to maintain when we ‘gray-beards’ are gone.”

Speaking about the Mollier Diagram for Equilibrium Air, Dr. Powell said, “The work and the knowledge that it represents were critical to the development of anything that returned from space, e.g. Mercury, Gemini, Apollo and the ballistic reentry.”

Hundreds attend Health Expo



Approximately 275 people attended the Health and Wellness Expo May 25 at the AEDC Fitness Center. More than 20 booths offered exposure and education on different dimensions of wellness. Class demonstrations also ran in the center of the gymnasium during most of the expo. (Photo by Rick Goodfriend)

To Afghanistan and back

Lieutenant Gurganus deploys, returns as executive officer

By Shawn Jacobs
Aerospace Testing Alliance

The last few months have been a bit of a whirlwind for 1st Lt. Jamie Gurganus.

Lieutenant Gurganus was a project manager in the Turbine Engine Ground Test Complex when she was notified she was being deployed to Afghanistan. She returned to AEDC in March after a six month deployment, only to find out she had been selected as the base's executive officer. Lieutenant Gurganus later found out June 7 she will have a permanent change of station (PCS) to Wright-Patterson AFB in October.

She said the prospect of deploying was overwhelming at first, but she feels fortunate to have been chosen.

"I didn't have a clue what to expect in the beginning, but it was an amazing experience," Lieutenant Gurganus said. "It

was a true blessing, and I'm very thankful I was picked."

Prior to deployment, Lieutenant Gurganus was sent to Fort Dix, N.J., for two weeks of training by Special Forces and others.

"It was all Air Force, from senior airmen to colonels, and we were split up and for 14 days straight you were learning a different skill every single day, whether it was land movement, land navigation, dismounted movements, how to move through a village [or] how to work in a convoy," she said. "It was extremely exciting. Everyone told me training is the hardest part, but I had a blast at training."

Kabul, Afghanistan, was her deployed destination, and she was stationed at New Kabul Compound (NKC), a small headquarters base right outside the Green Zone and a 20 minute ride from the airport.

"I worked for Brig. Gen. Margaret Boor, who's in charge

of Task Force Spotlight," Lieutenant Gurganus explained. "I worked [mostly] with contractors, but the majority of the military there were Army. There was Army, Navy, one Marine, myself and a couple of other Air Force members, so we had a very diverse crowd."

Most of the bases, Combat Outposts (COPs) and Forward Operating Bases (FOBs) occupied by U.S. troops are actually guarded by Afghani nationals who are employed by private security contractors. Part of her job was to verify, identify and enroll the guards.

The contractors were supposed to train the guards prior to enrollment.

"They go out there and they fire their weapons and have to bring the qualification record to our office at Task Force Spotlight and show proof, person by person," Lieutenant Gurganus said. "They don't have identi-



First Lt. Jamie Gurganus is pictured on the roof of the Kabul Hospital during her deployment to Afghanistan. Behind her is the Kabul skyline. (Photo provided)

fication, but Afghanis received taskara numbers from the province they were from. [We'd have] to take their fingerprints – a lot of them didn't know how to read and write – and document the best we could that this person is qualified to shoot this weapon, that they know the rules

of engagement and that if an incident were to happen that they are trained to react properly."

As part of a specific team that traveled around the Kabul area and elsewhere, she was also involved in biometrically enrolling

See **DEPLOYS**, page 15

AEDC runners brave the rain for Golden Baton relay



Carrie Reinholtz, a technology project manager in AEDC's Test Technology Branch and member of The TRL's relay team, slogs through the rain during the base's 26th annual Golden Baton Relay Race June 22. (Photo by Rick Goodfriend)

Jere Matty, deputy director of AEDC's Space and Missiles Ground Test Complex, passes a baton to Lt. Col. Gregg Leisman during AEDC's 26th Annual Golden Baton Relay Race June 22. Heavy rain during the morning didn't stop the four teams that took part in this year's race. Colonel Leisman's and Matty's team, The Scream Team, placed third in this year's race. The team Old Guys Never Quit placed first, Knights of the Dinner Table placed second, The Scream Team placed third and The TRL's placed fourth. (Photo by Rick Goodfriend)

DEPLOYS from page 12

the guards, further ensuring their identity and their allegiance to NATO forces. She was in charge of the eastern provinces, known as Regional Command East (RC East).

"To biometrically enroll these locals, we [used] a hand-held system called HIDE [Homeland Security, Biometric Identification and Person Detection Ethics]," Lieutenant Gurganus said. "It scans your retinas; it copies all 10 fingerprints; it takes your picture; and it also records your demographics. You can put in their taskara number, their name, where they're from. They don't know their birthdays, so you just kind of 'guesstimate' what year they were born."

She said the HIDE system would link up with other systems to run the guards against the current watch list.

"We'd go through an arming roster list from a COP and FOB, and there's a guard with the same taskara number and he pops up to be the current guy we're enrolling," Lieutenant Gurganus explained. "It lists what he did wrong and what action we should take. We came across a lot of bad guys, a lot of people who had direct links to the Taliban. [For example], this guy had been fired once for stealing ammo and for suspicious behavior."

She said, thankfully, she saw very little actual conflict during her deployment.

"We actually had a rocket attack at NKC the day before I got there," she said. "We had a suicide bombing at a nearby market that was right outside the Green Zone, but

it was on one of our main routes and, thankfully, we weren't out driving around that day. If there was any suspicion of something going on, we'd cancel our movements for the day."

Despite the potential danger, Lieutenant Gurganus said she actually felt honored by her deployment to Afghanistan.

"I met an incredible, diverse group of people who I would have never run into in my Air Force career when it comes to civilians, contractors, Navy, Marines, Army," she said. "I made some incredible friends that I will remember the rest of my life. They really became my family over there. It's a stressful environment, but thankfully good friends helped the days fly by."

"I really grew as a person over there; you kind of have to," Lieutenant Gurganus said. "It's a humbling experience. You know everyone signs up for the military with a patriotic feeling, but this is what you sign up to do. The fact that I did my small, small part in protecting our country's freedom, that was just a very big honor."

Lieutenant Gurganus was surprised when she returned from deployment to find that she had been selected as the base commander's executive officer, a slot that is usually filled by captains.

"Captain [Alex] Hausman was on his way out to do his own deployment and I was just getting back, so it was really perfect timing" she said. "It kind of worked itself out."

"When Colonel [Michael T.] Brewer comes in and takes over command, hopefully, he'll



Lieutenant Gurganus is pictured with an Afghani boy outside the Kabul Hospital. The youngster, who had been flying a kite, gave the troops a thumbs up and was happy to have his picture taken. U.S. troops must wear their Individual Body Army (IBA) to walk from the New Kabul Compound (NKC) and back. Also pictured is the interpreter for the Americans and members of the Afghan National Army (ANA). (Photo provided)

keep me as his exec, and maybe I'll just finish out my tour here since I'll be PCSing this October."

Lieutenant Gurganus, a native of Fayetteville, N.C., arrived at AEDC Aug. 4, 2008, with a criminal justice degree from

the University of North Carolina at Pembroke. Her father, James P. Gurganus, retired after 30 years in the Air Force and now lives in Franklin, Mass. She said she feels fortunate that Arnold was her first duty station and called

her time here "amazing."

"At Arnold, it's different," she said. "Second lieutenants and first lieutenants get to have a hands-on experience with the major projects that happen here. We really play a role in support-

ing the mission at AEDC.

"I really hope that I can take my experience and benefit from it as I go to Wright-Patterson later this year. It's been a good ride, and I'm thankful for every single day, especially my deployment."

Security Forces train at Arnold



Members of the 134th Security Forces Squadron visited Arnold AFB May 16-17 for training. At left, Airman 1st Class Kevin Clendenen trains with the M203 grenade launcher. AT right, Sgt. Boyd Knight fires the M4 Carbine. (U.S. Air Force photos/Staff Sgt. Scott Hollis)