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AEDC National Full-Scale Aerodynamics Complex: One of a kind, ready for future testing

By Deidre Ortiz
AEDC Public Affairs

The National Full-Scale Aerodynamics Complex, managed and operated by AEDC, remains the world's largest aerodynamics test facility and, because of its large size, has a wide range of testing capabilities that are unmatched by any other facility of its kind.

NFAC, a geographically separated unit located at Mountain View, Calif., is primarily used for determining the aerodynamic characteristics of large-scale and full-scale fixed wing, rotorcraft and powered-lift vertical and short take-off and landing aircraft. Additionally, it has the capability to perform other non-traditional types of wind tunnel testing on test articles as varied as wind turbines, parachutes and long-haul trucks.

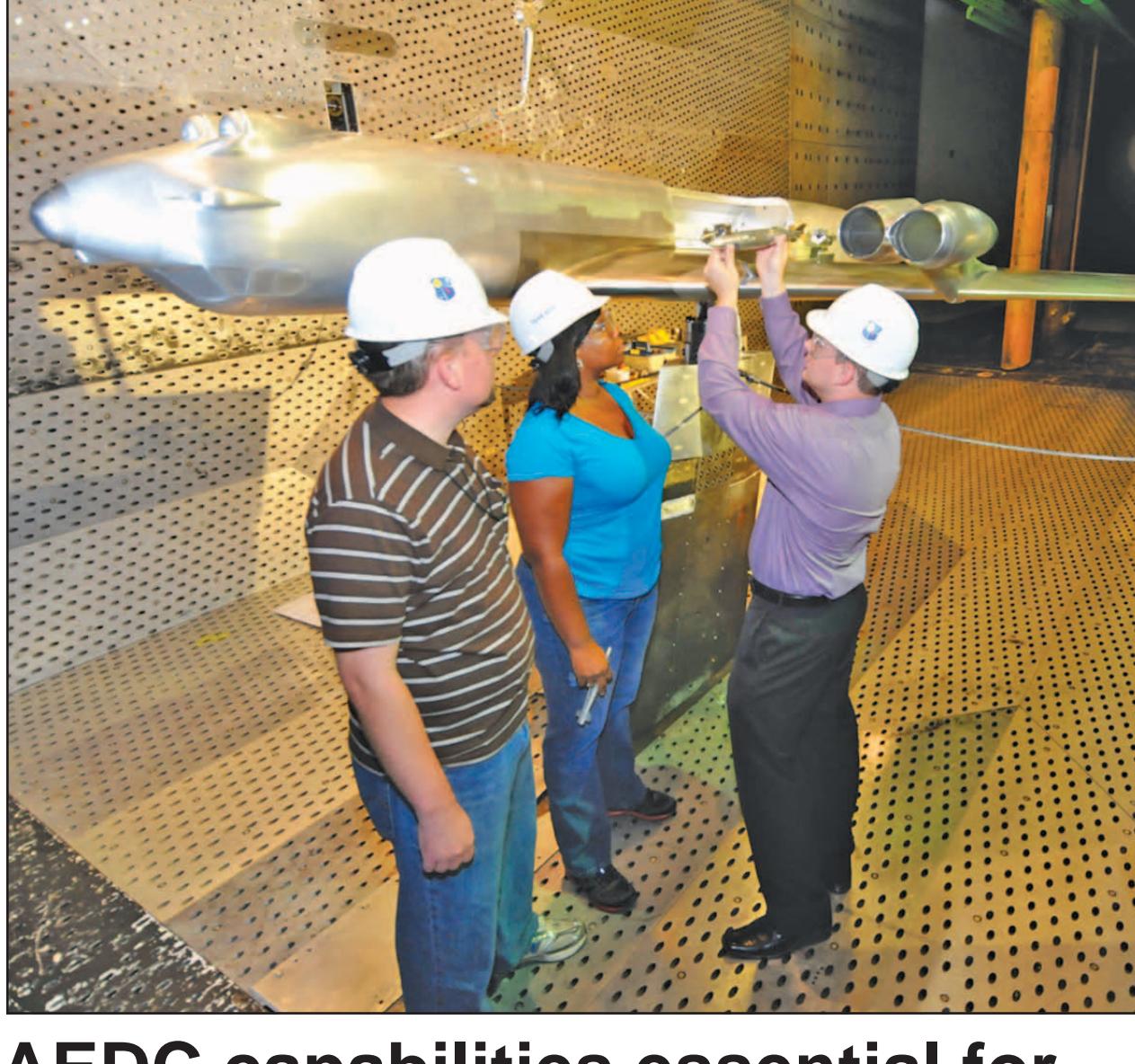
According to Jeffrey Johnson, NFAC Test Operations and Sustainment branch chief, new vertical lift technologies are being readied to undergo testing in the wind tunnel complex. These developments include models supporting the Joint Multi-Role (JMR) technology demonstration and the DARPA Tactically Exploited Reconnaissance Node programs. Both are precursors to the Department of Defense's Future Vertical Lift program, the plan for which is to develop a family of different sized military lift capabilities to meet various mission profiles.

NFAC has two wind tunnel sections, a 40- by- 80-foot originally built in the 1940s, capable of providing test velocities up to 300 knots and Reynolds numbers up to 3 million per foot. The other tunnel is an 80- by 120-foot test section, capable of testing a full-size Boeing 737 at velocities up to 100 knots at nominal unit Reynolds numbers of 1.1 million per foot. This open-circuit leg was added and a new fan drive system was installed in the 1980s.

See AERODYNAMICS, page 3



AEDC engineers were part of a test team that performed wind tunnel testing on the parachutes for the NASA Orion spacecraft in January 2015 at the AEDC National Full-Scale Aerodynamics Complex in Mountain View, Calif. (Courtesy Photo)



AEDC capabilities essential for B-52 upgrade

AEDC sets record in 2011 with largest aircraft model to conduct B-52H store separation test. Pictured left to right in 2011 is Paul Haas, B-52 Program Office, Tinker AFB; Druana Sanders, Booz-Allen & Hamilton, Inc.; and Don Arrowood, B-52 Program Office, Tinker AFB, examining the B-52H model stores in the AEDC 16-foot Transonic Wind Tunnel between store separation test runs. A B-52H Stratofortress, nicknamed "Ghost Rider," took to the skies for a functional test flight Aug. 30 at Tinker Air Force Base, Okla. (U.S. Air Force photo/Rick Goodfriend) See page 4 for the complete story.

Do's and don'ts for DOD employee political activities

By Eric Norton
AEDC Staff Judge
Advocate Office

As we draw near to the end of another presidential election cycle it is prudent that we take a moment and recall what activities government personnel – both civilian and military – can and cannot participate in regarding partisan political activity.

The following is general guidance and is not meant to be an exhaustive list of do's and do not's, but rather a tool to help each individual Department of Defense employee decide what activities they can legally take part in when it comes to partisan politics.

As a reminder, military members are subject to DOD Directive 1344.10, *Political Activities by Members of the Armed Forces*. Air Force military personnel are also required to follow Air Force Instruction (AFI) 51-902, *Political Activities by Members of the Air Force*, which states in part: While on active duty, however, members are prohibited from engaging in certain political activities as proscribed below in order to maintain good order and discipline and to avoid conflicts of interest and the appearance of improper endorsement in political matters.

DODD 1344.10 and AFI 51-902 set out an extensive list of both permitted and prohibited activities. Some permitted activities include registering to vote, voting, displaying a political bumper sticker on your private vehicle and expressing personal opinions on political candidates and issues, but not as a representative of the Armed Forces.

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Driving on base a privilege

By AEDC Safety

People who work on Arnold AFB often tend to forget or don't realize that driving on base is not considered a right but rather a privilege. As such, it should be treated accordingly.

This is done by obeying speed laws at all times, obeying traffic signs and being courteous with others that share the road.

The traffic rules are spelled out in chapter 4 of the Integrated Defense Plan (IDP) and can be viewed by anyone working on base.

As opposed to the civil citations, the military citation doesn't assess fines on a violator but rather points. This applies to both military and civilian employees on base. Excessive points on one's record could lead to loss of driving privileges which could

be particularly troublesome if driving is a part of one's job requirement.

According to the IDP, 12 traffic points within a 12-month period or 18 points within a 24-month period will result in loss of driving privileges for a one-year period.

Points are not normally assessed for parking violations however, according to the IDP, three parking violations within any 180-day period will also result in a loss of driving privileges for 30 days. If you are a military member or federal civil service employee, these points will also follow you to any installation to which you may transfer.

Additionally, individuals who have been granted base driving privileges have also given implied consent to a chemical test of their blood, breath or urine upon suspicion of

driving under the influence. They have also consented to the removal and temporary impoundment of their vehicle in the event it is parked illegally for an extended period of time or interfering with vehicle operations.

The speed limit on base is generally 35 mph, except in parking lots where 15 mph is the limit. However, drivers should never operate vehicles at a greater speed than is reasonable under existing conditions. Seat belts use is the law and will be enforced on and off base.

As a reminder, it is against DOD policy to operate a privately owned vehicle while using a cellphone without a hands-free device anywhere on AEDC property. It is also against DOD policy to operate a government or company owned vehicle while using a cellphone

without a hands-free device at any time.

Motorcycle Safety Information

Military personnel, who operate or intend to operate a motorcycle on a roadway, operators of government-owned or leased motorcycles and Air Force civilian personnel who are required to operate a motorcycle IAW (in accordance with) position description, will successfully complete the motorcycle safety training prior to operation. It is the rider's responsibility to possess a valid motorcycle license, endorsement or riders permit before operating a motorcycle on a roadway, to include travel to and from training location(s).

All other personnel are highly encouraged to seek training at their own expense. All newly assigned military personnel will



AEDC Safety reminds AEDC team members to obey the traffic signs at all times. (U.S. Air Force photo/Holly Peterson)

complete the commander's initial motorcycle safety briefing within 30 duty days of assignment or identification as a rider. This is accomplished when you in-process through the AEDC Safety Office.

AEDC Fitness Trail closed for weekend and holiday hunting

By AEDC Natural Resources

The AEDC Fitness Trail will be closed for deer hunting Saturday – Sunday, now through Jan. 15, 2017.

The trail will also be closed during the holidays which dates include Oct. 10, Nov. 11, Nov. 24, Dec. 26 and Jan 2, 2017.

Small game, waterfowl, turkey and deer hunting will also take place on AEDC Wildlife Management Area (WMA), which is on much of the remaining 35,000 acres of Arnold AFB, through Jan. 15, 2017. The WMA is managed by Tennessee Wildlife Resources Agency and more information about hunting opportunities, hunting regulations and bag limits can be found at <https://www.tn.gov/twra/article/region-2-wmas>.



Franklin County Industry Day students tour AEDC

Paul Denton, right, a computer numerically controlled (CNC) programmer at the Model and Machine Shop, talks to a group of Franklin County students who participated in the Franklin County Industry Day on Oct. 6 and toured AEDC as part of the program. One of the stops on the tour was the Machine Shop, where the students were able to ask questions about how different items needed for testing at the Complex are fabricated. (U.S. Air Force photo/Jacqueline Cowan)

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Both test sections are lined for acoustic testing.

A system of moveable vanes can be positioned so that air is either drawn through the 80 by 120-foot test section and exhausted into the atmosphere, or driven around the closed circuit through the 40- by 80-foot test section. A passive air exchange system is utilized in the circuit to keep air temperatures below 125 degrees Fahrenheit.

The fan drive system is composed of six variable pitch fans, each 40 feet in diameter, arranged in two rows of three. Each fan has 15 laminated wood blades and is powered by a 22,500 horsepower electric motor. The six fans rotate together at 180 rotations per minute drawing 106 megawatts of electricity at full power while moving more than 60 tons of air per second.

Part of the NFAC capability are two rotor test beds incorporating electric motors and rotor balance systems that are available for testing complete rotor and hub systems independent of the flight vehicle. In addition, the NFAC maintains the expertise to

conduct engineering development of new powered models in support of customer needs. Unique, test-specific requirements are explored with each NFAC test customer to guide the experiment design, and new systems are integrated into the facility as needed. Utility support systems that have been used for testing powered vehicles and components include variable-frequency electrical power, hydraulic power units, cooling water, 150 and 400 hertz (cycles per second) electrical power and jet fuel systems.

Parachutes, helicopters, helicopter blades and wind turbines are only a few projects that have, and continue to be, tested at NFAC. Orion parachute testing was performed in the 80-by-120-foot wind tunnel in late 2014 and early 2015 prior to Exploration Mission-1. NASA researchers, AEDC engineers, NFAC personnel and Airborne Systems worked to help improve the safety and reliability of landing the Orion spacecraft. In all, the team tested 13 parachute configurations.

It is important to highlight for both military members and civilian employees that the use of common social media sites such as Facebook, Twitter, etc., does not exempt or shelter you from complying with applicable laws and regulations.

For example, if you are a member of the military and your social media site identifies you as such, then your posts must clearly and prominently state that the



Two test team members prepare the AMELIA, or Advanced Model for Extreme Lift and Improved Aeroacoustics, model for a test in a wind tunnel section of the National Full-Scale Aerodynamics Complex (NFAC) at Mountain View, Calif. NFAC, managed and operated by AEDC, remains the world's largest aerodynamics test facility and is primarily used for determining the aerodynamic characteristics of large-scale and full-scale fixed wing, rotorcraft and powered-lift vertical and short take-off and landing aircraft. (Courtesy photo/Mike Anderson)

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A few prohibited activities include engaging in partisan fundraising activities in federal offices or facilities for political causes or candidates, using official authority or influence to interfere with an election and speaking before a partisan political gathering.

For the complete list of permitted and prohibited activities, please refer to the DODD and AFI referenced above and available at the link <http://www.dtic.mil/whs/directives/corres/pdf/134410p.pdf>.

For civilian employees, the rules regarding political activities are in a Federal law called the Hatch Act

(Title 5, US Code, Sections 7321 –7326) and its implementing regulations (Title 5, Code of Federal Regulations, Part 734).

The Hatch Act is ad-

ministered and enforced by the U.S. Office of Special Counsel (OSC). OSC guidance provides “generally, federal employees can avoid violating the Hatch Act if they (1) do not engage in political activity while on duty or in the workplace; (2) do not engage in political activity in an official capacity at any time; and (3) do not solicit or receive political contributions at any time.”

For further information

on the Hatch Act, please refer to the OSC website for a list of frequently asked questions at, <https://osc.gov/Pages/HatchAct-FAQs.aspx>.

It is important to highlight for both military members and civilian employees that the use of common social media sites such as Facebook, Twitter, etc., does not exempt or shelter you from complying with applicable laws and regulations.

For example, if you are a member of the military and your social media site identifies you as such, then your posts must clearly and prominently state that the

views expressed are those of you as an individual only and not those of the Department of Defense or your service. Also, when an active duty military member posts or links to specific political parties or candidates it is interpreted by the DOD as distributing literature for the party or candidate, which is prohibited by DOD 1344.10.

Political activity for civilian employees involving social media sites, and other partisan activities, can quickly lead to Hatch Act violations. For an extensive review of permitted and prohibited activity please go the OSC web site

at <https://osc.gov/Pages/The-Hatch-Act-Frequently-Asked-Questions-on-Federal-Employees-and-the-Use-of-Social-Media-and>Email.aspx>.

As citizens, it is our duty and our privilege to engage in the political process. As government employees we have an obligation to ensure our opinions, activities and social media posts do not appear to be an effort on our part to influence the outcome of any election. We must exercise our rights and responsibilities with due diligence to stay within the confines of law and regulation.

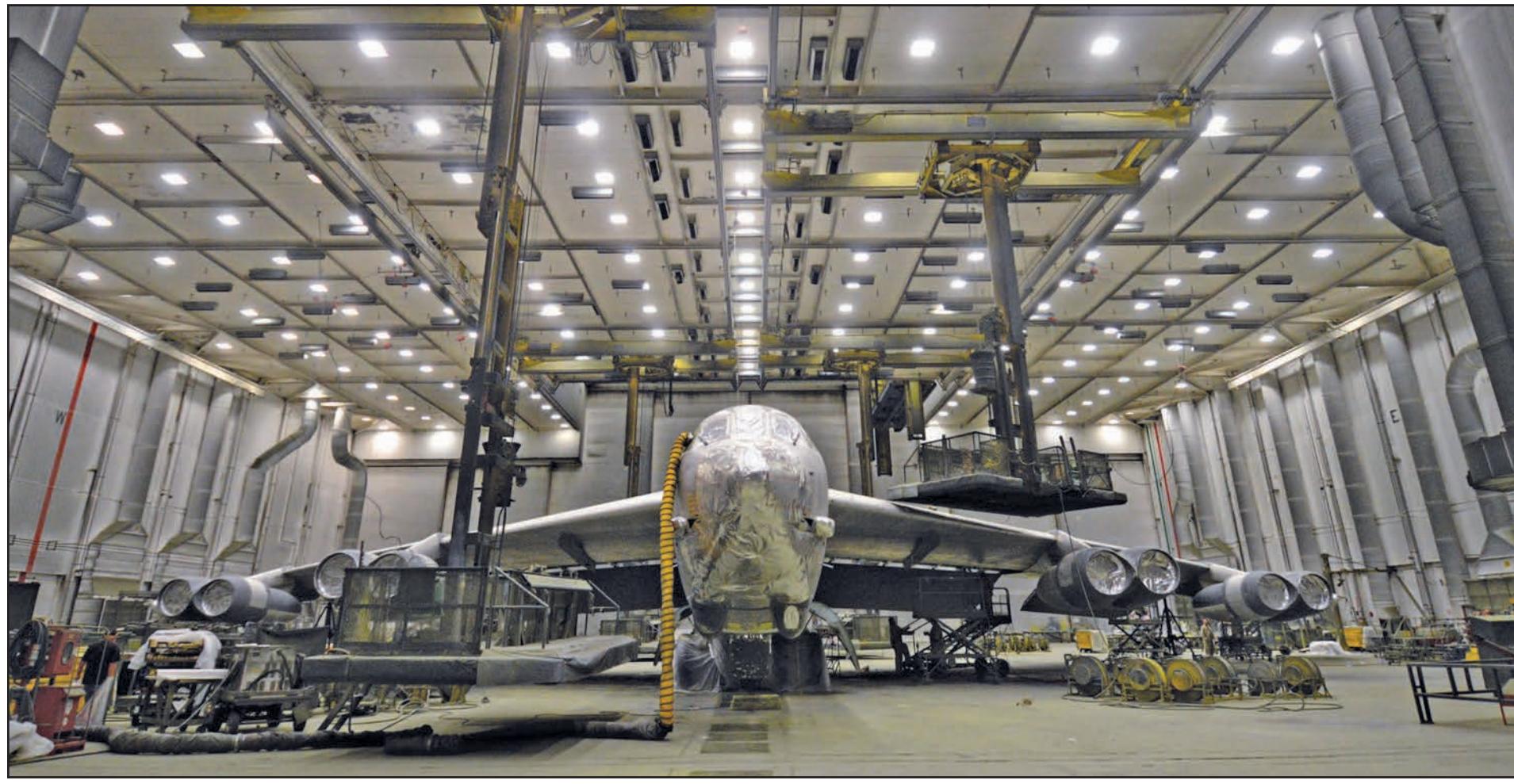
Finally, don't forget that

Election Day is Nov. 8. The polls in Tennessee are open from 7 a.m. – 7 p.m. Early voting in Tennessee starts Oct. 19. The last day to apply for an absentee ballot

is Nov. 1 and the application must be received by this date. Early voting ends Nov. 3. For more information on the Tennessee voting calendar please go to the Tennessee Secretary of State website at <http://sos.tn.gov/products/elections/election-calendar-2016>.

If you have any additional questions, please contact the AEDC Public Affairs Office at 454-4204 or the Legal Office at 454-7814.

'Ghost Rider' in the sky: B-52 departs Tinker in historic flight



A B-52H Stratofortress spent three days in paint before getting its signature nose art, with the nickname "Ghost Rider," and returning to the active fleet at Tinker Air Force Base, Okla. Ghost Rider is the first B-52H to ever be regenerated from long-term storage with the 309th Aerospace Maintenance and Regeneration Group at Davis-Monthan AFB, Ariz., and returned to fully operational flying status. (U.S. Air Force photo/Kelly White)

By John Parker

72nd Air Base Wing
Public Affairs

TINKER AIR FORCE BASE, Okla. (AFNS) - The first B-52H Stratofortress to be resurrected from long-term storage at the Aerospace Maintenance and Regeneration Group (AMARG) to rejoin the active strategic bomber fleet soared into the sky from Tinker Air Force Base Sept. 27.

The historic flight, which the aircraft is nicknamed "Ghost Rider," marked the end of the warbird's 19-month transformation from a mothballed, 55-year-old, eight-engine jet parked in the Arizona desert to a fully updated conventional- and nuclear-capable global strike bomber platform.

Testing at AEDEC contributed to up-grades for the B-52 fleet.

Tinker's 76th Aircraft Maintenance Group handed over the plane 90 days ahead of schedule to Air Force Global Strike Command. Ghost Rider will join the 5th Bomb Wing at Minot AFB, North Dakota.

"I am extremely proud of the team that was able to deliver Ghost Rider back to Air Force Global Strike Command," said Brig. Gen. Mark Johnson, the Oklahoma City Air Logistics Complex commander. "This is really a testament to accomplishing the art of the possible. It shows that when there is a common goal, team members from across multiple organizations can rally behind the objective and deliver their team's full impact to the project."

Tinker's 565th Aircraft Maintenance Squadron completed the overhaul, modernization and restoration work in 272 calendar days.

Charles Alley, the 565th AMXS director, said maintainers, engineers and support teams were excited to work on the historic project, spending approxi-

mately 45,000 man-hours restoring Ghost Rider to fighting shape.

Alley said pilots of Tinker's 10th Flight Test Squadron flew the B-52 six times to verify system functionality and ensure a safe and reliable aircraft before declaring the plane ready for delivery Sept. 13.

The jet needed an extra 7,000 hours over normal programmed depot maintenance to "get it up to speed with all the other B-52s in the fleet," Alley said.

"I told people during test flight that because the aircraft sat in the desert so long, we're knocking all the ghosts out of it," he said. "It seemed like every time it came back it had two or three different things wrong with it."

Lt. Col. Darrel Hines, a B-52 flight commander with the 10th FTS, flew the plane from Arizona to Barksdale AFB, Louisiana, in February 2015, and flew in part of the six final functional test flights. The plane arrived at Tinker AFB on Dec. 14, 2015, with overhaul and maintenance work beginning Dec. 31, 2015. The plane was due to be delivered later this year on Dec. 23 but was delivered 90 days early.

Hines praised all the organizations involved in the restoration, including the 309th AMARG, the OC-ALC, Air Force Life Cycle Management Center, and above all the maintainers whose skilled hands-on work made the difference.

"This was a great team effort from multiple commands and it was a great success," Hines said.

"Now this plane is going to come out of Tinker back to the warfighter, and it's going to be a huge asset to the guys going out in combat."

Ghost Rider will join 75 other B-52Hs in the Air Force's operational bomber fleet.



Chris Carson and Martin Harpster, both aircraft mechanics with the 565th Aircraft Maintenance Squadron, work on throttle cable pulleys on the right wing of a B-52H Stratofortress at Tinker Air Force Base, Okla. This particular aircraft nicknamed "Ghost Rider" was the first B-52H to ever be regenerated from long-term storage with the 309th Aerospace Maintenance and Regeneration Group at Davis-Monthan AFB, Ariz., and returned to fully operational flying status. (U.S. Air Force photo/Kelly White)



A B-52H Stratofortress, this one nicknamed "Ghost Rider," takes to the skies for a functional test flight Aug. 30 at Tinker Air Force Base, Okla. The B-52H is shown in natural metal since it has been overhauled and must be checked for full functionality before being painted. Ghost Rider is the first B-52H to ever be regenerated from long-term storage with the 309th Aerospace Maintenance and Regeneration Group at Davis-Monthan AFB, Ariz., and returned to fully operational flying status. (U.S. Air Force photo/Kelly White)

AF launches year-long 'Cyber Secure' campaign

By Mike Martin

*Secretary of the Air Force
Public Affairs*

WASHINGTON

(AFNS) – The Force message is clear – October may be National Cybersecurity Awareness Month, but with the continuous advancement of technology and evolving cyber threats, one month of cybersecurity awareness is no longer enough.

In a memorandum sent to Air Force personnel, Lt. Gen. William J. Bender, the Air Force's chief information officer, said he was establishing the Chief Information Security Of-

fice (CISO) and beginning a yearlong Cyber Secure campaign in October to address cybersecurity throughout the service.

"We must position cyber at the forefront of our thinking, planning, and operations," Bender said. "Cybersecurity depends on every Airman, regardless of rank or job description. Every time you log onto a system, click on a link, download a file, or plug one device into another, we risk exposing our systems to exploitation."

In other words, when it comes to cyberspace, everything is connected.

"Every Airman who plugs an unauthorized device into a network or circumvents a security control on a maintenance loader needs to understand that he or she is creating vulnerabilities for our enemies to exploit," Bender said.

Maj. Gen. Cedric D. George, the Air Force deputy chief of staff for logistics, said it's important to emphasize at every echelon of command that data and information are primary reasons we must take cybersecurity seriously.

"Data remains a strategic, operational and tacti-

cal asset," George said. "It's as important to logicians as fuel. No Jet Propellant 8, no airpower; no secure and synthesized log data, no airpower – period. We need every Airman to understand that cybersecurity awareness and the mission systems we connect to are inextricably linked, and we must be cyber secure."

Air Force leadership also emphasized that the cyber domain is much more than the internet.

"While the internet is part of cyberspace, it is not all of cyberspace,"

Bender said. "Any computer system capable of

communicating with other computer systems in some way is part of cyberspace. A desktop computer, an avionics computer on an aircraft, a smart phone,

an industrial controller, and the processors on a modern car are all part of cyberspace, although only

some of them are routinely connected to the Internet.

Most modern military equipment – from a hum-

ble truck to a B-2 (Raider) bomber – has some form of processor and is thus reliant upon and a part of cyberspace."

"It is not just the cyber-

space warriors who need to adapt; operators and support personnel who focus on the physical do-

mains also need to practice

operating effectively in an environment of constant change where not every-

thing works as expected,"

he said. "Everyone in the total force must learn to think of cyberspace as a war-fighting domain.

Mission assurance is not something created by technical experts alone."

Popular social media trend may violate DOD regulations

By Tech. Sgt. Robert Barnett

Secretary of the Air Force Public Affairs

WASHINGTON (AFNS) – A young woman paced herself as she ran around her neighborhood, her breath visible as the brisk morning air cycled through her lungs, the wind blowing her hair back, and her cheeks stinging from the elements. She dodged people walking their dogs, trash cans left out for pickup, and finally reached a pausing point where she took out her phone.

Dressed in civilian workout attire, she performed a pushup challenge on camera, and then explained to her social media audience how the pushups were intended to raise awareness for veteran suicide prevention and honor fallen veterans.

In this scenario, no one could tell she had taken an oath and wore a military uniform to work.

Some Airmen have participated in similar activities while in uniform or at their workstations. While they are allowed to participate in activities to honor fallen Airmen or bring awareness to issues like suicide, if these activities are associated with any type of nonprofit,

non-federal entity, or fundraising or membership campaign, it cannot be done in an official capacity.

Participation in one's official capacity, however well-intended, may be perceived as federal endorsement of a non-federal entity. Even if an Airman doesn't mean to formally imply Air Force endorsement of any particular non-profit entity or cause, participation in uniform has the potential of giving the appearance of official endorsement by the Air Force.

Airmen interested in supporting non-profit organizations and fundraising causes may do so if they follow established guidelines, such as Air Force Instruction 36-3101, "Fundraising within the Air Force," Department of Defense Regulation 5500.07-R, "Joint Ethics Regulation," and Office of Government Ethic's regulations on standards of ethical conduct for executive branch employees, 5 C.F.R. 263.808.

There are limited exceptions for the Combined Federal Campaign, military relief societies, disaster appeals approved by the Office of Personnel Management, and groups made up primarily of DOD employees and their family members.



The local staff judge advocate's office is available to assist Airmen and employees who have questions about these rules.

Basic considerations to keep in mind when supporting nonprofits:

- Fundraising cannot be done during duty hours, although lunch hours are permissible.
- No form of endorsement is allowed while in uniform.

• No fundraising is allowed in the workplace.

• Fundraising by private organizations and unofficial activities can generally not occur during CFC or Air Force Assistance Fund.

Ready to continue her run, the woman saw several people had liked her post, not because she was military but because they believed in the cause.

AEDC Safety provides guidance on using power outlet extensions

By AEDC Safety

When there's no place to plug in that new piece of equipment, what do you do?

You probably are tempted to use one or more extension cords to reach the nearest unused outlet or add a power strip to get more outlets.

Almost certainly most of us do not think of them as dangerous but the U.S. Consumer Product Safety Commission declares extension cords among the most dangerous of electrical appliances.

What's wrong with using an extension cord, a power strip or even a surge protector to run more electrical equipment?

If too many pieces of equipment are plugged into the same outlet and they're all on at the same time, more current may be running through the outlet than it can handle creating an electrical fire hazard.

Extension cords can be used for up to 90 days but must be used properly. Surge protectors are recommended over power strips and extension cords. However, a sufficient number of well located three-wire/ground-

ed outlets will eliminate the need for extension cords or power strips.

Overloaded circuits can cause an electrical fire. An overloaded circuit may be recognized by an outlet or wall that is warm to the touch; a discolored outlet; circuit breakers that frequently trip or fuses that frequently blow; or a burnt smell of insulation is noticeable.

An extension cord, power strip or surge protector is only to be plugged directly into an outlet and not another extension cord, power

strip or surge protector. They should not be strung together in series or "daisy-chaining."

Equipment or appliances should also be plugged directly into an outlet but, if necessary, may be plugged into a surge protector. Extension cords or power strips without surge protection are not recommended.

Extension cords and cords from power strips or surge protectors, equipment and appliances are not to be run under rugs or carpets. The heat build-up is a potential fire hazard.

Project Management Institute announces speaker of October luncheon

By Douglas Brown
AEDC Plans & Programs

The Project Management Institute (PMI) Southern Middle Tennessee Branch will hold a luncheon meeting at the University of Tennessee Space Institute Oct. 27 11 a.m.-12:30 p.m.

Join local project management professionals for a time of networking and learning. Guest speaker will be Leanne Sigrist Barron. Barron is a trainer, leader and coach who has been working in the training and development industry for over 15 years. She holds a bachelor's degree in psychology from the University of North Carolina at Chapel Hill, a master's degree in human resource development from Texas A&M University, is

a certified training professional and is a Myers-Briggs Type Indicator® certified training professional. She will be discussing "Team Building and Communication."

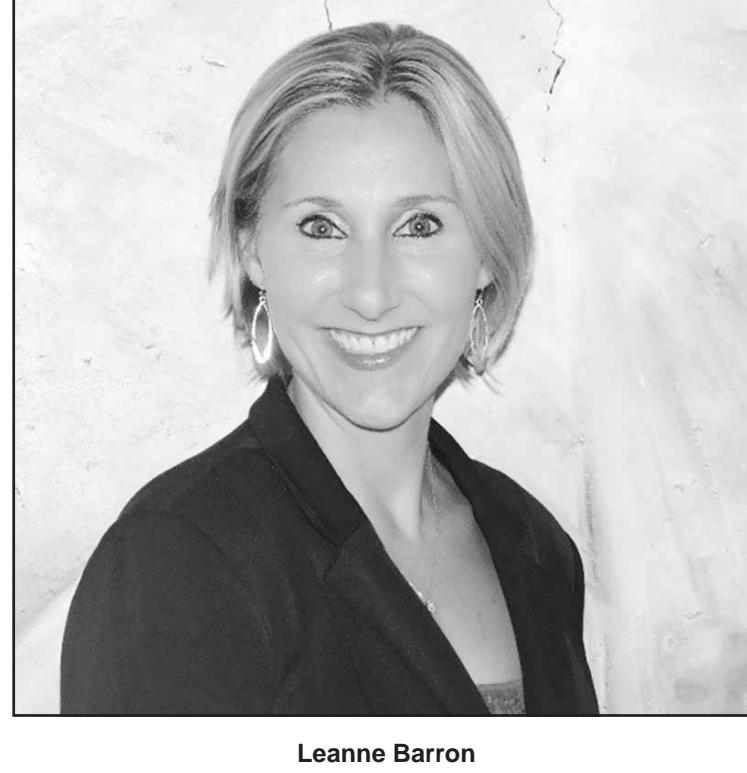
She specializes in customized soft skill training and team building workshops for organizations as well as career coaching for individuals. Her mission is to set the individual and organization up for success and promote learning new skills, self-analysis, communication techniques; building new methods, leadership modules and training programs; changing team morale, productivity and engagement.

Barron believes in her roles as lifelong learner, bridge builder and change agent. She

inspires others to examine their own communication practices in order to improve their personal and professional lives.

The Project Management Institute is the world's leading not-for-profit professional membership association for the project, program and portfolio management profession. PMI advances careers, improves organizational success and further matures the profession of project management through its globally recognized standards, certifications, resources, tools, academic research, publications, professional development courses, and networking opportunities.

Call 454-6728 for additional information about joining the local branch or to make a reservation for the luncheon.



Leanne Barron

What do you need to know to effectively raise awareness about depression?

By Air Force Medical Service

There is no single cause of depression. However, certain things can raise a woman's risk for depression:

- Genetics (family history): If a woman has a family history of depression, she may be more at risk of developing it herself. However, depression may also occur in women who don't have a family history of depression.
- Chemical imbalance: The brains of people with depression look different than those who don't have depression. Also, the parts of the brain that manage your mood, thoughts, sleep, appetite, and behavior don't have the right balance of chemicals.
- Hormonal factors: Menstrual cycle changes, pregnancy, miscarriage, postpartum period, perimenopause, and menopause may all cause a woman to develop depression.
- Stress: Stressful life events such as trauma, loss of a loved one, a bad relationship, work responsibilities, caring for children and aging parents, abuse, and poverty may trigger depression in some people.
- Medical illness: Dealing with serious medical illnesses like stroke, heart attack, or cancer can lead to depression.
- Symptoms of depression may include:
 - Feeling sad or empty
 - Feeling hopeless, irritable, anxious, or guilty



- Loss of interest in favorite activities
- Feeling very tired
- Difficulty concentrating, remembering, or making decisions
- Thoughts of suicide or suicide attempts
- Persistent physical symptoms such as headaches, digestive disorders, or chronic pain
- The U.S. Preventive Services Task Force recommends that everyone undergo screening for depression, regardless of their risk factors.
- On average, approximately 16 million new cases of depression are diagnosed in the U.S. each year.
- Less than two-thirds of people diagnosed with depression receive care.
- The DoD is taking measures to decrease the stigma associated with seeking behavioral healthcare.

Flexible batteries: Evolving energy for the 'new' reality

By Marisa Novobilski
Air Force Research Laboratory

WRIGHT-PATTERSON AIR FORCE BASE, Ohio (AFNS) — It's a \$7 million research industry today, expected to be worth \$400 million by 2025. For researchers at the Air Force Research Laboratory's Materials and Manufacturing Directorate, the "energy" spent in this research area is worth much more.

By using highly conductive, flexible carbon nanotube mats, scientists here have developed a new type of flexible lithium-ion battery that not only stores energy, but can be folded, bent and manipulated hundreds of times without voltage fluctuations, revolutionizing power sources for the warfighter technology of today.

"It's time to 'rethink' energy," said Ryan Kohlmeyer, a materials research scientist with UES, Inc. and contractor at AFRL. "There is great interest in flexible electronics. People want to have things like wearable sensors and flexible displays that need power. Traditional lithium-ion batteries, which are hard and rigid, need to evolve to meet the new reality."

Lithium-ion batteries are common in many home and portable electronics, including computers, mobile phones and wearable fitness trackers. Compared to traditional batteries, lithium-ion batteries charge faster, last longer and have a high-energy capacity, enabling them to deliver a large amount of power in a small package.

Given these benefits, lithium-ion batteries provide a platform for powering small sensors and battlefield devices — if

the form factor can be changed to meet the application needs.

"If you're moving around in the field, you don't want to wear something that is bulky and rigid," Kohlmeyer said. "Flexible batteries are conformal, meaning that they can move with the person and the device they power. The applications for this type of technology are limitless."

Traditional lithium-ion batteries consist of a negative electrode, or anode, and a positive electrode, or cathode, coated on a metal foil current collector. Between these electrodes is a thin polymer separator, which keeps the electrodes from touching and allows lithium ions to pass through during charging or discharging.

To fabricate their flexible power source, Kohlmeyer and fellow researcher Aaron Blake, a graduate student at Wright State University, exchanged the commonly used metal foil current collectors for chemical vapor deposition-grown carbon nanotube mats. Carbon nanotubes are known to be highly conductive and extremely strong — two features a flexible battery would need in order to generate power in diverse forms.

The researchers prepared the batteries by placing a separator between a carbon nanotube-based anode and cathode that they then encapsulated in a thin, flexible plastic film. The battery was then charged and placed under mechanical testing where it was bent and creased to see if it could perform consistently under extreme mechanical abuse.

See ENERGY, page 9

Thanks to Green Dot training, Hurlburt serviceman helps save woman from potential kidnapper

By Kelly Humphrey

HURLBURT FIELD — If you drive on or around Hurlburt Field, you will see some cars sporting a magnetic green dot.

The unusual accessory is designed to start a conversation. The goal is that the question "What's with the green dot?" will lead to a discussion about Green Dot training.

The Air Force has contracted Green Dot, etc. to present the training, which gives students tools to intervene in a potentially violent situation.

For Tech Sgt. Jeremy Davey, the training, which he completed in early May, had almost immediate real-world applications.

Earlier this month, Davey and his wife, Svetlana, and their nearly 2-year-old daughter, Zoey, were enjoying a day at Navarre Beach.

"If you've ever been there, you know that to your right are the hotels and con-

dos, and to the left there's absolutely nothing," Davey said. "I happened to look over to the left, and I saw something."

The "something" was a young man who was propping up a young woman who was clearly having trouble walking.

"I thought to myself, 'It's probably nothing, but what if it's something?'" Davey said.

He gestured toward the pair and mentioned it to his wife.

"She looked at me and said, 'Jeremy, you're going to Green Dot, aren't you?'" Davy recalled with a smile. "I told her, 'I think I have to.'"

Davey decided to approach the man, who was walking the semi-conscious woman toward the parking lot.

"I asked him, 'Excuse me, sir, is everything all right?'" Davey said.

The man assured him that the woman, who was his friend, simply had too much to drink, and he was going to take her home. Something still didn't seem right to

Davey, however, so he persisted. He asked the man what the woman's name was.

"He started to stumble with his words, and he started to let her go and put her down on the ground," Davey said.

"At first, I was afraid he might be getting ready to fight me. But he just said, 'I don't have time for this,' and walked away."

While Davey tended to the woman, who was extremely inebriated, he noticed four other young women headed in

his direction.

"When they came over to us, they were like, 'Oh my God, Sandra, are you OK?'" Davey said.

It turns out that all five women were visiting Navarre from out of town. The young man whom Davey met had come up to the women at a bar and had walked away with Sandra.

While he doesn't know for sure what might have happened if he hadn't intervened, Davey suspects that the man might have abducted Sandra. He credits his Green Dot training with giving him the tools to get involved.

"The goal of the training is to change our culture from one of passive acceptance that violence is going to exist, to active intervention," he said. "It doesn't take one person doing one big thing to make a change. It's many people doing many small things that will change the culture."



Women can prolong their lives by taking these steps

By J.D. Levite

Air Force Surgeon
General Public Affairs

FALLS CHURCH, Va. — Everyone — children and adults and men and women — should take charge of their own health to ensure they're able to live a long and

healthy life. One of the most important things women can do to maintain good health is schedule an annual Well Woman visit with their healthcare provider.

Well Woman exams help assess individual risks for women and can provide services for

immunizations, contraceptives, screening for disease and counselling for sexually transmitted infections.

"This is probably the most important thing women can do for their health," said Maj. Joshua Duncan, the chief resident for General

Preventive Medicine Residency with the Uniformed Services University of Health Sciences. "An annual Well Woman visit is an opportunity to detect and prevent disease."

He said it's also used as one of the ways to screen for domestic vio-

lence. "Unfortunately, abusive relationships often go unrecognized. This is also an opportunity for us to help people who may be in domestically violent relationships."

When it comes to immunizations, Duncan said the vaccine for the Human Papillomavirus is a huge success for women. It's a form of primary prevention, which means the vaccine prevents the disease from ever happening in the first place.

HPV is "the virus that causes genital warts and cervical cancer," Duncan said. "We don't get many cures for cancer, and this is a way to prevent one type of cancer, which I think is pretty awesome."

To achieve the best results, the vaccine usually starts at a young age, and women entering their child-bearing years should start getting Papanicolaou tests, or Pap smears. This test checks for changes caused by HPV, and it's something women in their 20s should get every three years.

"A lot of women are reluctant to come in because of Pap smears. It's probably not the most comfortable experience for many patients," Duncan said, "but for women age 30 and over we're now spacing it to every five years as long as they're getting the blood test (that looks for HPV), too."

Another thing women in this age group should consider is folic acid supplementation. Folic acid can help prevent birth defects in case of pregnancy, and Duncan said most women's multivitamins include it.

Women going into their 50s or older should expect to start getting mammography, which is a screening tool that checks for breast cancer, and should be aware of their bone health.

"Women over 65 are at an increased risk for osteoporosis," Duncan said. Osteoporosis is a disease where bones lose the strength they once had and can result in broken bones

and increased injury after falls, but there are medications women can take to help strengthen their bones. He also said women younger than 65 may be at increased risk for osteoporosis, and their risk factors will be reviewed during an annual Well Woman visit.

The three most important things women can do to stay healthy is commit to an annual Well Woman checkup every year, take charge of their own healthcare, and speak up.

"What patients do at home is far more important than anything we can do in an office visit," Duncan said. "We are there to provide education and provide some services, but healthcare is a partnership and our patients are the ones responsible for doing all the heavy lifting."

He added some of the things women can do on their own is maintain a healthy diet and constant exercise, practice safe sex, and even learn more about themselves through their family's history.

"Women who have a family history of cervical cancer or ovarian cancer may be at increased risk for developing breast cancer. There's a genetic mutation that puts them at increased risk. So if this is something that runs in your family, it's important to let your provider know during your annual visit."

Duncan said women who are more prepared for their healthcare visits will see positive impacts in their health.

"By staying on top of these preventive services, you can prevent diseases," he said. "You can catch them early enough that we can intervene and provide treatments that prolong your quality of life and let you do the things you want to do for a longer period of time."

Two resources Duncan recommended include [WomensHealth.gov](#) and [AHRQ.gov](#), which has a section to help patients come up with questions they should be asking with every visit to the doctor.

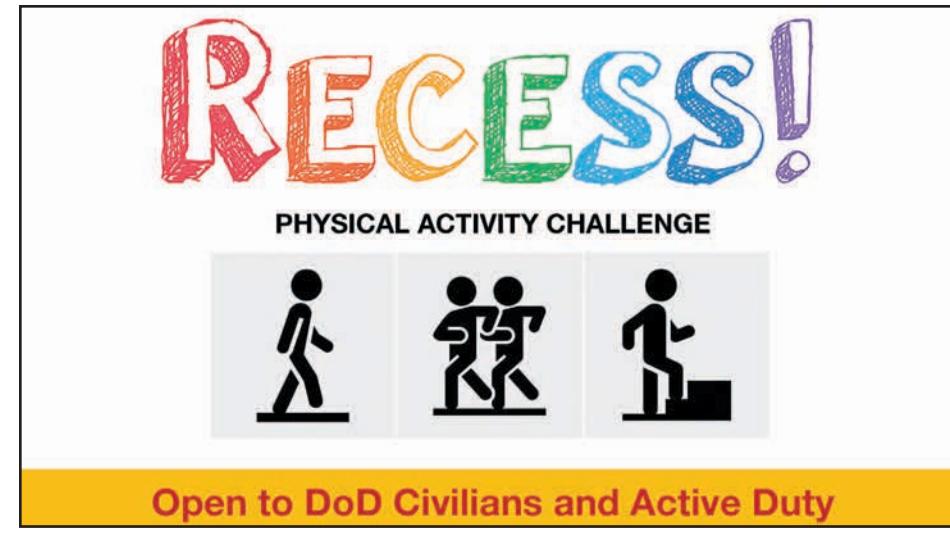
AFMC promotes 'RECESS' physical activity challenge

By Air Force Materiel Command Health & Wellness Team

WRIGHT-PATTERSON AIR FORCE BASE, Ohio – During the months of October through December, Air Force Materiel Command will promote its RECESS physical activity challenge.

RECESS is a command-wide initiative which is conducted by Civilian Health Promotion Services, to help the AFMC workforce increase movement by promoting short bursts of physical activity throughout the day.

According to a 2015 study of the health effects of sedentary time on adults published in the *Annals of Internal Medicine*, more



Open to DoD Civilians and Active Duty

than half of the average person's waking hours are spent sitting, watching television, working at a computer, driving, or doing other physically inactive pursuits.

The study documented higher rates of type 2 dia-

betes, cancer, and cardiovascular disease in very sedentary people.

The RECESS physical activity challenge promotes regular movement to combat sedentary behavior. Examples of how to increase movement would include:

- Taking short walks during lunch and throughout the day.
- Using the stairs instead of the elevator.
- Standing while talking on the phone.
- If you work at a desk for long periods of time,

try a standing desk – or improvise with a high table or counter.

Moving more and sitting less daily will help you to counteract the detrimental health effects of sitting. The key is to move your body frequently during the course of the day.

How to participate in the RECESS Physical Activity Challenge:

1. Enroll online at <http://www.afmcwellness.com/> between Sept. 19-Oct. 26.

2. Complete the initial check-in event with CHPS between Oct. 5-26.

3. Perform and log at least 720 minutes (12 hours) of physical activity between Oct. 17-Dec. 2. Log activity minutes on

the <http://www.afmcwellness.com/> Activity Log from Oct. 17-Dec. 2.

4. Attend the CHPS education class, "Physical Health Triangle" between Oct. 17-Dec. 2.
5. Attend final check-out with CHPS between Dec. 6-16 to receive the challenge completion award.

Participants that complete the RECESS physical activity challenge requirements will receive a free Restore Strong Core & Back Kit from CHPS. Contact your physician before beginning any physical activity program to be sure it is safe.

For more information, visit <http://www.afmcwellness.com/>.

'Protect the Power' and your pockets

By Secretary of the Air Force Public Affairs

WASHINGTON (AFNS) – Though monthly observances and themes come and go, the practices promoted in October's Energy Action Month are encouraged year-round.

The Defense Department is arguably the United States' biggest energy consumer, and the Air Force is responsible for at least half of that consumption.

According to Air Force Secretary Deborah Lee James, the Air Force must invest in new technologies that will allow it to operate less expensively and cleaner in the future, and more effectively at the strategic level, to preserve this resource without mission compromise.

Without energy, the Air Force would not be able to carry out some of its core missions such as intelligence, surveillance and reconnaissance; space; and cyber.

The Air Force has already taken several steps in an effort to save energy.

After Air Combat Command's procurement of more aerospace ground equipment to support the national airborne operations center e-4B alert cycles, the Air Force stands to save 600,000 gallons of fuel by adding AGE at just four other duty locations.

Additionally, Air Materiel Command flight planners recently resolved a global airspace issue for its tankers, eliminating the additional fuel they were requiring for all flights over

Egyptian airspace, saving AMC over \$1 million.

By being aware of energy consumption, Airmen and their families can also actively save energy.

There are several practices individuals can incorporate into their daily activities – from work to home – that can help "Protect the Power."

At home, go natural by turning off the lights and use sunlight when it's available. Using this free resource instead of power can help save up to 40 percent of an electricity bill.

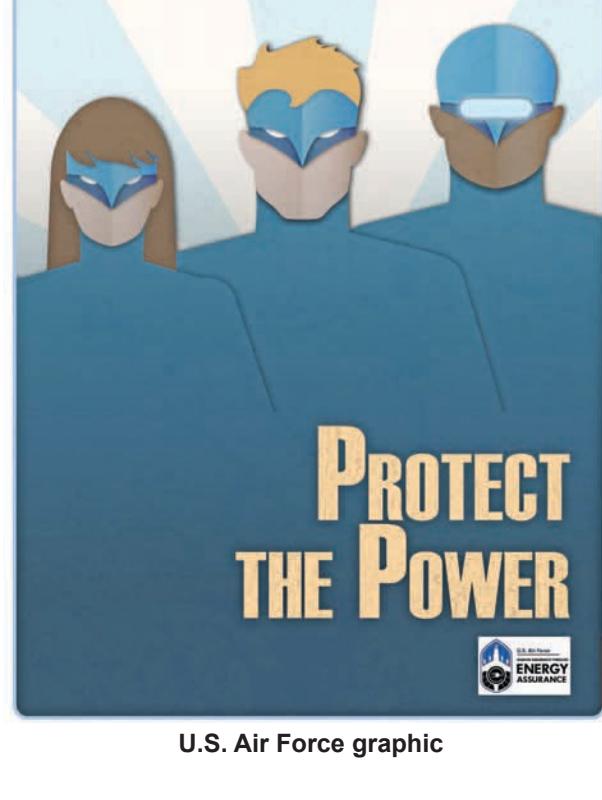
In the car, slow down. Instead of driving 75 mph, consider a lesser speed of 55 mph. Driving at slower speeds can save up to 25 percent in fuel costs, and if it takes \$40 to fill up a vehicle's gas tank every two

weeks, savings could reach \$240 a year.

At work, conserve energy by remembering to turn off computer monitors at the end of the day. Combined, monitors use more energy than any other piece of equipment, so try to remember to cut them off when not in use for an extended period of time.

Mini-power savers also play a role. Try posting reminder cards to help get youth in the habit of saving.

(Editor's note: Information for this article was provided by <http://www.safie.hq.af.mil/Programs/energy/action>. Visit the site for more ways to Protect the Power.)



U.S. Air Force graphic

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The battery's performance exceeded expectations, maintaining a steady voltage even after more than 288 folds and manipulations. In contrast, a similar device made with traditional metal foil current collectors showed a performance loss with each crease and catastrophic fracture after only 94 folds.

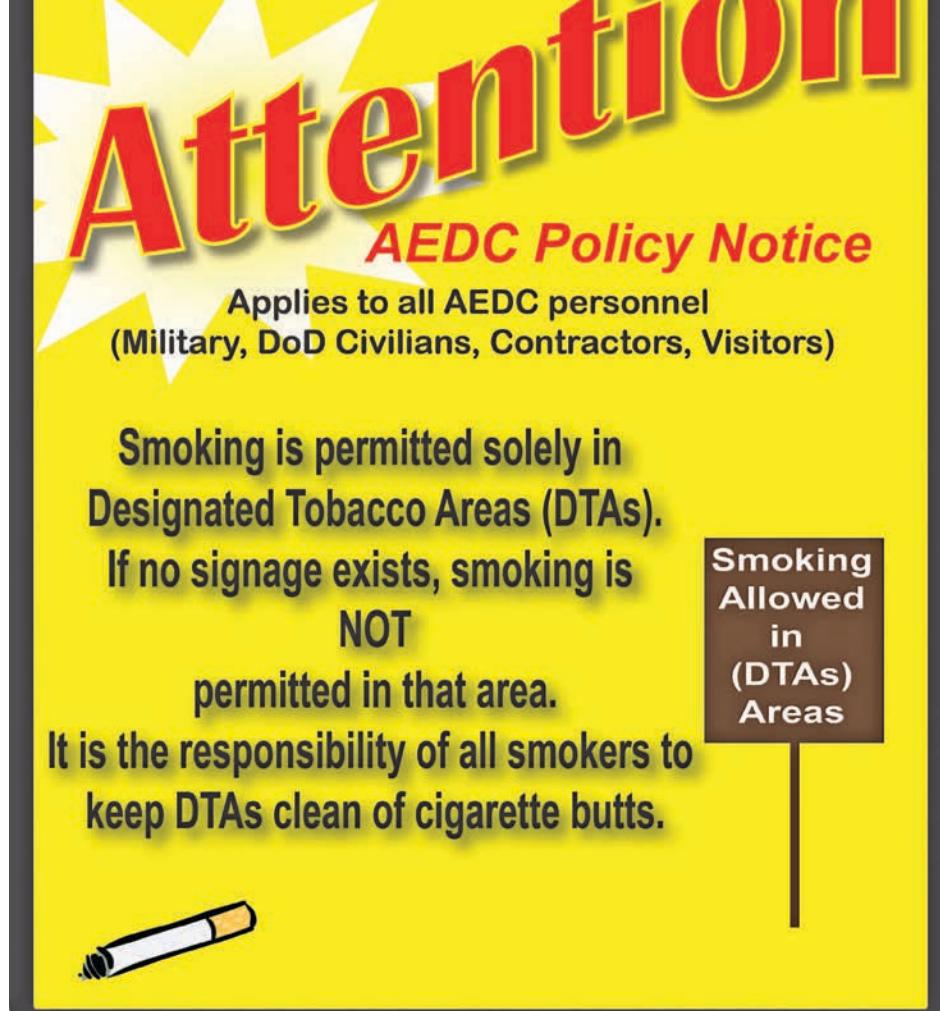
"The voltage of the flexible battery remained steady even when it was flexed or creased hundreds of times. We only started to lose power when the material

encapsulating our battery began to allow moisture to get inside the system and degrade the electrolyte and active materials," Kohlmeier said. "We believe that our system is way ahead of anything else in this area."

The research team, led by Dr. Michael F. Durstock and supported by Dr. Les Lee, with funding from the

Air Force Office of Scientific Research, has filed a provisional patent related to this system and is excited at the potential to see the technology get into the field.

As human performance sensors and flexible device development continues, the flexible battery will be there to meet the power needs of the future.



AEDC Woman's Club announces new meeting day

By Barbara McGuire
AEDC Woman's Club

The next meeting of the AEDC Woman's Club will be at the Arnold Lakeside Club Nov. 3, which is a change of day to the first Thursday in the month instead of the first Tuesday.

The program for November, which will include the Secret Shopper event, is still in the planning stages. The AEDCWC Secret Shopper purchases will be presented and the Secret Shopper queen will be crowned.

Table donations for November will go to the

Fisher House of Murfreesboro.

The Club recently held their October meeting where Nashville music artists Dawn and Nash performed and table donations of \$135 were collected for the Shepherd's House of Tullahoma.

The November meeting is open to the public and provides the opportunity to meet the AEDCWC members and become a member. You don't need to have military connections or be involved with Arnold Air Force Base to visit and become a member.

For information about

the AEDCWC call 455-3569.

The social hour of the meeting starts at 9:30 a.m., with the business meeting and program beginning at 10 a.m.

Reservations and cancellations must be made no later than noon, Oct. 27. Make reservations or cancellations by calling 931-393-2552 or 931-636-4152.

Disclaimer: This is a private organization which is not part of the Department of Defense or any of its components and has no governmental status.



Music artists Dawn and Nash, from Nashville, perform at the AEDC Woman's Club meeting Oct. 4 at the Arnold Lakeside Club. (Courtesy photo)

Hurricane Hunters fly data-gathering missions through Hurricane Matthew

By Maj. Marnee A.C. Losurdo
403rd Wing Public Affairs

KEESLER AIR FORCE BASE, Miss. (AFNS) – The Air Force Reserve's 53rd Weather Reconnaissance Squadron has been conducting around-the-clock operations flying into Hurricane Matthew to collect critical weather data for the National Hurricane Center in Miami to improve the center's computer models that forecast movement and intensity.

The squadron, part of the 403rd Wing and better known as the Hurricane Hunters, has been flying the storm since Sept. 26. They started flying the storm from the Henry Rohlsen Airport, St. Croix, U.S. Virgin Islands, and moved operations to Keesler Air Force Base Oct. 5.

Hurricane Matthew formed off the coast of Africa in late September, became a hurricane Sept. 29 and rapidly intensified to Category 5. It hit Haiti Oct. 4, the Bahamas Oct. 6, and made its way up the Florida coastline Oct. 7 as a Category 2 storm.

First Lt. J. Kelsie Carpenter was the aerial reconnaissance weather officer on a flight that left at 4 a.m. Oct. 7 and returned at 2 p.m. In addition to the aerial reconnaissance weather officer, the crew consists of a pilot, co-pilot, navigator and a weather loadmaster. They work together to collect vital data on a storm's intensity and direction that assists the NHC with their forecasts and storm warnings.

"We got a lot of good information and data today," Carpenter said. "We learned it's a strong

storm; it's slowly weakening, but its proximity to coast is why it's important and why we are flying it around the clock."

To gather this data, the aircrew flew through the eye of Hurricane Matthew six times to locate the low-pressure center and circulation of the storm. During each pass through the eye, they released a dropsonde, which collects weather data on its descent to the ocean surface, measuring wind speed and direction, temperature, dew point and pressure. During storm flights, the aircrews transmit weather data via satellite communication every 10 minutes to the NHC.

On Oct. 7, the Hurricane Hunters found winds up to 120 mph at an elevation of 10,000 feet and 110 mph at the surface, said Carpenter.

"With this kind of



First Lt. J. Kelsie Carpenter, a 53rd Weather Reconnaissance Squadron aerial reconnaissance squadron officer, collects meteorological data during Hurricane Matthew Oct. 7. This data is sent to the National Hurricane Center to improve forecast track and intensity models. (U.S. Air Force photo/Maj. Marnee A.C. Losurdo)

forecast and keep people safe," Carpenter said.

The storm currently has taken more than 800

See MATTHEW, page 11

ARNOLD AFB COMMISSARY

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Follow Us



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lives and left thousands without power. 53rd WRS pilot who has flown through the eye of Hurricane Matthew 27 times, stressed the importance of heeding storm warnings and evacuation orders. He said he is proud of the mission and service the Hurricane Hunters provide to the people in the community and make an informed decision on whether to hunker down or get out of town," he said.

Information subject to change. Please call to verify.

ALC – Arnold Lakeside Center, 454-3350	GC – Arnold Golf Course, 454-GOLF
Café – Café 100, A&E, 454-5885	MG – Mulligan's Grill, GC, 454-FOOD
ODR/ITT – Outdoor Recreation, 454-6084	FC – Fitness Center, 454-6440
RRRP – Recycling, 454-6068	WI – Wingo Inn, lodging, 454-3051
Marketing/Sponsorship – 454-3128	Resource Management – 454-7425
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Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
1	2	3	4	5		
8 Café 100 <i>National Cappuccino Day</i> Venti \$3 Grande \$2.75		Café 100 <i>National Sandwich Day</i> Combo \$6 Movie: Ben-Hur PG-13	ALC Jam Night 6pm Movie: Jason Bourne PG-13			
6 Set your clocks back 1 hour!	7 Autumn Dinner by the Lake	9	10	11 Veteran's Day Arnold Lakeside Center- Closed Barber Shop- Closed Café 100- Closed Fitness Center- Open 8-4	12	13 ODR Winter Hours Tue, Thu, Fri, Sat, & Sun 10am-5pm Closed Mon & Wed
13 M \$23 NM \$25 Age 12 & under \$10.50 5:30 PM Outdoor Thanksgiving dinner overlooking the lake behind the ALC with live guitarist and fire pits. Top Round and Roasted Turkey carving station, baked potato and salad bar, dessert, and drink. Sign up by Nov. 11 Call 931-454-4003	14 FC Triple Threat Challenge First 20 participants get a T-Shirt. Lift 1000 lbs. and get a hoodie. BENCH PRESS BACK SQUAT DEADLIFT	15 Brushes & Bottles at Arnold Lakeside Center \$25 6pm Sign up by November 11 Movie: Alice Through the Looking Glass PG-13	16 Holiday Closures: Arnold Lakeside Center Barber Shop Café 100 Fitness Center Golf Course Outdoor Rec	17 Holiday Hours: Arnold Lakeside Center- Closed (No trivia) Barber Shop- Closed Café 100- Closed Fitness Center- Open 8-4	18 Friends and family coming to town? Wingo Inn welcomes both military and civilians, friends and family to be our guests! Call 931-454-3051	19 Every Friday at Arnold Lakeside Center... Members enjoy free social hour food 3:30-5:30pm (non members \$5) AND... Members could win Services gift card 6:00pm – starts at \$25 goes up \$5 weekly if no winner (max \$500) Grab an entry in all Services facilities by showing your current club card! Must be present to win! One entry per Club Card per facility per day.
20 21 22	23 Barber Shop Open 8-12	24 Happy Thanksgiving Day	25	26 		
27 28	29 Fitness Center Kettlebell Class Tuesdays and Thursdays 11-11:45am	30 	Membership has its privileges! Weekly Prizes: 3 Apple MacBooks 4 Ticketmaster eGift Cards 2 Curved 4K Ultra HD Smart LED TV's Grand Prize: Jeep Wrangler			

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