HIGH MACH

AEDC 1951-2011 SIXTY 60 YEARS ANNIVERSARY

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60th COVERAGE on page 9

Over 60 years, AEDC's wind tunnels have seen a variety of work

By Patrick Ary
Aerospace Testing Alliance

When the Air Force sent Capt. Win Phipps to AEDC in 1989, his last job before being assigned to the base was to switch phones over to a new digital system.

Today, as a civilian test manager for the base's wind tunnel systems, he has seen advances in aviation that go way beyond the jump from an analog to a digital phone.

"In the 90s I supported numerous strategic planning sessions at the Gossick Leadership Center for years, and I remember all the debates on whether we'd see unmanned fighters or unmanned aircraft," Phipps said. "That debate went on for several years, and now remotely-piloted aircraft ha become the norm for aircraft in development that we may see."

In fact, today the premier unmanned aircraft – the RQ-4 Global Hawk used extensively in the wars in Iraq and Afghanistan – was tested in AEDC's wind tunnels during its development. It's one of several leaps forward in aviation that was put to the test at Arnold AFB.

AEDC operates wind tunnels in two primary facilities on base: the Propulsion Wind Tunnel Facility (PWT) and the von Kármán Gas Dynamics Facility (VKF). AEDC also manages two wind tunnels at remote operating locations: the Hypervelocity Wind Tunnel 9 in Maryland and the National Full-Scale Aerodynamics Complex at Moffett Field, Calif.

The body of work that has come through the tunnels in the last 60 years is staggering. The facilities are capable of aerodynamic and propulsion integration testing for large-scale aircraft models. Propulsion systems and inlets can be tested simultaneously in PWT to make sure engines receive adequate airflow. Workers can also test store separation systems to ensure bombs and missiles separate cleanly from aircraft when released.

Because of the vast capabilities of the tunnels, they've seen everything from fighter jets to weapons systems and space vehicles. There have even been tests on parachute systems and ejection seats, according to ATA Aerodynamics and Propulsion Section Manager Bill Peters.

"We have actually performed ejection seat testing with instrumented mannequins exposed to the actual flight conditions and orientations," Peters said. "Testing has been conducted to simulate the environment that might have been expected as the pilot was ejected from the cockpit. Often times, the tests in the past

See **FLIGHT**, page 4

A Lockheed Martin engineer inspects a model of the F-35 Joint Strike Fighter Lightning II during a break in aerodynamics load testing in AEDC's 16-foot transonic wind tunnel in 2006. (File photo)

Bob Rogers, inventory manager for ATA's Materials Control Team, examines inventory in one of the bench stock areas for which is he is responsible March 24. With more than 54 years of service, records show Rogers is AEDC's longest consecutively employed worker. (Photo by Rick Goodfriend)

After 54 years, Bob Rogers looking forward, not back

By Shawn Jacobs
Aerospace Testing Alliance

With AEDC celebrating its 60th anniversary June 25, at least one man can recall most of those years as an employee.

Records show Tullahoma native Bob Rogers, 76, is the longest consecutively employed worker, with more than 54 years of service. Having hired in Nov. 8, 1956, Rogers was honored five years ago as the first person to hit 50 years of continuous service at AEDC.

See **ROGERS**, page 5

AEDC Fellow looks back on 60 years of history

By Philip Lorenz III
Aerospace Testing Alliance

Mitchell

In 1989, Dr. James G. Mitchell became one of the first AEDC employees to be recognized by the AEDC Fellows program. This program had been established to recognize people who have made exceptionally distinguished contributions to the center's flight testing mission.

Dr. Mitchell grew up in Luverne, a small farming community in southern Alabama and later helped out in the country store his father managed. Even as he began his senior year in high school, a career in engineering, or any other field, was not something he had ever considered.

"I had no idea what I wanted to do for a living growing up," he said. "I only knew two things I didn't want to do. I didn't want to be a farmer and I didn't want to run the country store."

Shortly after World War II ended, great concern was already building in the nation about the Soviet Union's military build-up.

"Our military at that time was anticipating conflict right then with the Soviet Union," he recalled. "In my senior year in high school, some government man came through and gave a talk to our small class. He said that if you're really good in math and physics and science that you owed it to your country to become an aeronautical engineer.

"Since I was a good Boy Scout and a patriot, I said, 'well, that sounds like a pretty good idea.'"

Dr. Mitchell, who has always considered himself a risk taker,

See **MITCHELL**, page 7

Capt. Joe Shetterly will fly the A-10 Thunderbolt II in this year's Kiwanis Fireworks and Air Show. Captain Shetterly received his first active-duty assignment at AEDC in 2003. (U.S. Air Force Photo)

Former AEDC project manager to fly in air show

By Patrick Ary
Aerospace Testing Alliance

When an A-10 Thunderbolt II takes to the skies over Tullahoma July 1, it will be a familiar sight from the cockpit for Air Force Capt. Joe Shetterly.

When Captain Shetterly got his first active-duty assignment eight years ago, it was at Arnold AFB. He arrived on the weekend of the Centennial of Flight Celebration air show in 2003.

"We drove into town with all of our household goods and everything and actually went to the airport before going to housing," he said. "And that's where we met one of the guys who has become one of my very close friends."

Shetterly spent about a year at Arnold AFB before going into undergraduate pilot training. During that time, he spent time at the airport dropping skydivers out of a Beech 18 – a plane his father used to fly night freight on, and one he always wanted to fly.

Today, Captain Shetterly is Officer in Charge of the Air Combat Command's A-10 Demonstration Team. He's responsible for showcasing the A-10 at air shows around the world.

"It's just something I've always been around and passionate about doing, so to get to fly for the Air Force and also fly in air shows for the Air Force is kind of a dream come true," Captain Shetterly said.

His demonstration will be one of the many sights to see July 1 at the 2011 Kiwanis Fireworks and Air Show at his old stomping grounds: the Tullahoma Municipal Airport. The A-10 demonstration is part of AEDC's celebration of the Independence Day holiday as well as the center's 60th birthday.

"The theme is to show how AEDC has been involved and linked in with the A-10, but also for support to the warfighter and support to the community," said Maj. Scott Dubsky, who is helping

See **AIR SHOW**, page 8

Air Show Details

- **Friday, July 1**
- **Tullahoma Municipal Airport**
- **Gates open at 3 p.m.**
- **For more information: *www.kiwanisfireworks.com***

HIGH MACH

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An Air Force Materiel Command Test Center

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"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

U.S. AIR FORCE

Core Values

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

Smart summer strategy the key to staying safe

By Col. Michael Panarisi
AEDC Commander

Winning strategies seem to come in all shapes and sizes … "the best defense is good offense" often attributed to heavyweight prize fighter Jack Dempsey. Others opine that "defense is the best offense."

If you dig around, you can find opposing views on types of strategies, such as my personal favorite, the "prevent defense" successfully executed by the Super Bowl champion Denver Broncos but disdained by legendary coach John Madden, who once mentioned "All a prevent defense does is prevent you from winning."

Faced with such contradictory advice, it's easy to see how developing a smart summer strategy can be tough.

I suspect all of these strategies will work. In this case, the strategy may not be the key. Maybe it's all in the planning. Planning is all about thinking, and if we're looking for advice on a framework, you just can't go wrong with Karl von Clausewitz.

Military history buffs know Karl all too well. The 19th century Prussian general is best known for his seminal work "On War," and is often cited as the "father of warfare strategy."

This summer, I'd like to declare war on injuries, and it turns out Karl has some advice for us along these lines.

"War is not an exercise of the will directed at an inanimate matter." Summer presents us with a wide array of activities, scenarios, and lots ways to find ourselves en route to the ER. Karl would advise us to keep in mind that nothing in our plans can rely on a static environment. Expect the unexpected!

"Everything in war is very simple. But the simplest thing is difficult." High temps, long days, and a strong temptation to cram as much fun as possible into a single day … all the ingredients you need for a bad outcome. Take the time to think about the risks in your plan, and look at where you can simplify the order of the day to help keep things manageable.

Panarisi

"Many intelligence reports in war are contradictory; even more are false, and most are uncertain." Clausewitz was not a big fan of his Intel Officer, and if you think you can predict everything that could go wrong this summer, you might not end up where you'd like.

Karl reminds us that here in middle Tennessee, weather can change quickly, traffic can pile up suddenly and that boat that you were sure was going to turn left might just turn right.

Don't rely entirely on what you thought was going to happen … have a backup plan at the ready!

Fortunately, we came through our first "test" (Memorial Day Weekend) unscathed. Our neighbors in the surrounding communities did not … a death on Lake Normandy, numerous reports of accidents and "close calls" on Tims Ford, and across Tennessee, 10 fatal traffic incidents – four on motorcycles and six in cars. The Highway Patrol had the difficult task of informing three families that their loved one was killed in a traffic accident and was not wearing a seat belt.

The base is not immune though as we found out Monday evening, when a man not affiliated with AEDC drowned at the Gossick Leadership Center beach. There was no lifeguard on duty and according to fellow swimmers who had returned to shore, he chose to swim alone. That combination of factors proved fatal and a sunny day at the beach ended on a dark note.

We are now in what the USAF calls "the 101 critical days of summer." Supervisors play a key role in setting the tone in their workplaces, and have a strong influence on how their team members spend time away from AEDC. All of us need to build our own "Smart Summer" plans.

Think "critically" about what you are about to do, and we'll continue are strong history of keeping our team intact over the summer months. Offense, defense, or a little of both, let's make Karl proud!

Think about others before making decisions

By Staff Sgt. Anthony Huling
20th Equipment Maintenance Squadron

SHAW AFB, S.C. (AFNS) – My life was changed forever Feb. 11.

It was a Friday. I was glad to be getting off work, because I was going to be on leave for the next two weeks.

Around 5 p.m., my friend, Chris, texted me and asked if I wanted to come over to his house. Since my wife was taking my daughter over to a friend's house, I decided to go.

When I arrived, he was in his garage building a paint booth for his motorcycle. So, I started helping him out. We were working and having some drinks. Somewhere around 10:30 p.m., we decided to take his motorcycle for a spin.

We headed out of our neighborhood, and it was only about a half mile before we veered off of the road.

The next thing I remember is waking up in a helicopter. It felt like a bad dream. I asked the EMT where I was and what happened. They told me that I had been in a motorcycle accident, and I was being airlifted to the hospital. I was told that we were driving between 80 and 120 mph.

Chris and I were thrown about 100 feet from the cycle. There were several bones broken in my back and road rash on my forehead, back, chest, stomach, knees, ankles and toes. I now have nerve damage in both arms.

Chris was not as lucky. He has severe head trauma and some broken ribs. He is also currently in a coma and is not responding.

I can only hope and pray that he will wake up.

Our selfish act affected our family, friends and coworkers.

When his wife heard us leave she got in her car to find us. She was passed by an ambulance heading out and followed. She arrived on scene and saw us lying on the asphalt.

She rushed back to my house to get my wife. Luckily, my oldest daughter was spending the night at a friend's house.

Chris was just recently married, and his wife was pregnant. We had to postpone my youngest daughter's second birthday party.

Most people don't get a second chance in life. I would have never made this mistake if I had not been drinking.

I thought I had a safe plan.

But, that all fell apart because I could not make any responsible decisions after I started drinking.

I pray that none of you will ever have to go through something like this. The world does not look the same as it did before the accident. Only by God's grace am I alive and able to tell this story.

Last issue's answer:

Aerospace Testing Alliance was awarded the AEDC general operating contract on **June 30, 2003**.

Last issue's winners:

Scott Glass

Brad McClure

Next issue's question:

In what year was work completed on PWT's tunnel 16T?

Read this issue of *High Mach* to find the answer if you don't know it! E-mail your answers to ***Arnold.HighMachAnswers@arnold.af.mil*** no later than next Friday, June 17. Three winners will receive a 60th anniversary *High Mach* hat. The winners' names will be drawn at random from all correct entries. Only current AEDC employees are eligible to win.

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

Question:

The outdoor recreational area is very nice and my family really enjoys it. This year, however, we've noticed that it seems to have more trash. Is it going to be cleaned and maintained?

Also, in recent years the outdoor recreational area has been opened to the public. Will it continue to be opened to the public? The open policy seems to result in more trash and other problems. Last year we had several encounters with dogs being brought to the beach area, pit bulls in particular. I don't think this area is a place for pets, as children and adults will have bare feet most of the time there.

I just wanted to mention these things in hopes that it would be maintained a little better. My family hopes to be able to enjoy it again this year.

We do appreciate being able to use this area, it is a very nice asset to our community.

Response:

Thank you for your inquiry regarding the recreational facilities at Arnold Air Force Base. We currently allow the general public to use the Gossick Leadership Center Beach located on North Shore Drive. To do so, public patrons must first obtain a pass from the security officer located at Arnold Village and retain the pass in their possession while using the recreational site. Passes are periodically checked by the lifeguards, when on duty, and installation security personnel.

The recreational area is maintained from Memorial Day through Labor Day and every effort is made to keep it free from debris and trash.

The recent Memorial Day weekend averaged over 200 guests per day, making it difficult to keep the beach area clean. We appreciate guests doing their part to help keep the recreation area clean and safe for everyone to use.

Pets of any kind are prohibited in all beach recreation areas. Any unsafe condition, misconduct or policy violation should be brought to the immediate attention of the lifeguard (when present,) or the security officer tat the gate entry to Arnold Village.

Our surrounding communities are important to us and we are pleased to be able to allow public use of this recreational facility. This is only possible because of feedback and active participation by patrons enabling us to keep the recreational areas safe and clean.

Smoking Policy

1. 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:llpapro.arnold.af.millPORTALlimages/Smoking area map. 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.

2. Supervisors at every level will ensure this policy is followed. Disciplinary action is appropriate for repeated violations.

3. Updates to this policy will be made in the future to further align with Air Force guidelines.

4. This letter supersedes previous letter dated 28 October 2006, subject as above.

More management changes take place in ATA

By Patrick Ary
Aerospace Testing Alliance

More ATA employees are stepping into new roles after last month's departure of former ATA General Manager Dr. David Elrod.

Dr. Elrod left AEDC May 25 to become senior vice president of business development at Jacobs Technology in Tullahoma.

Steve Pearson was named Dr. Elrod's successor as general manager. Pearson's role as deputy general manager was filled by Philip Stich, formerly the director of ATA's Integrated Test and Evaluation (TE) Department.

Effective June 6, Chip Stepanek replaced Stich as the new director of the Integrated Test and Evaluation Department.

Stepanek began his career at AEDC in 1981 as a test project engineer in the von Kármán Gas Dynamics Facility (VKF). He also worked in the technology area and most recently served as director of the Performance Management Group.

"Chip is a 30-year AEDC employee who has demonstrated an outstanding performance capability in every assignment that he has undertaken," Pearson said.

Stepanek

Herron

McAmis

Christa Herron transfers into Stepanek's former role in the Performance Management Group. Herron is a 25-year AEDC employee with experience in testing, project management, financial management and a myriad of other pertinent skills.

"I am excited to have Christa's financial and strategic thinking skills to support our ATA contract performance," Pearson said.

Herron was previously deputy director of the Integrated Test and Evaluation Department. Dr. Rob McAmis, a 27-year AEDC employee, has stepped into that role. Dr. McAmis began his career at AEDC in the Engine Test Facility (ETF) analysis group and has gained testing and performance analysis experience in turbine and rocket propulsion systems through his progressive assignments. He has headed the Turbine Engine Analysis section under ATA since 2006.

"Rob is a proven technical and management performer who will be a great complement for Chip Stepanek in leading the Integrated Test and Evaluation Department," Pearson said.

Exercise tests AEDC response during large natural disaster

By Philip Lorenz III
Aerospace Testing Alliance

Recently, floods and tornadoes have dominated the news, impacting lives and destroying homes throughout a wide area, now, throw in an earthquake.

No, not the real thing, but a large-scale natural disaster exercise that included Arnold AFB.

AEDC conducted an earthquake exercise in conjunction with the National Level Exercise and Ardent Sentry 2011 during the week of May 16-20.

Think the prospect for an earthquake in the mid-South and Central U.S. sounds farfetched? According to geologists and other leading scientific experts, it is not a matter of if, but when a major earthquake will occur along the New Madrid fault centered in Missouri.

Daryl Justice, ATA emergency management lead, and Dan Johnson, ATA's installation exercise program officer, want people to know what to expect.

Johnson said one of the primary purposes of the exercise was to lead AEDC in taking on the role as an incident support base for the Federal Emergency Management Agency (FEMA). The multi-day format of the exercise allowed every tasked organization to conduct a comprehensive review of emergency plans and procedures.

"We want to know if they will work and if each tasked organization can meet their responsibilities," he said. "FEMA has evaluated Arnold Air Force Base as a federal asset and they want to use our runway area to stage emergency relief supplies.

"So, we will become a transportation hub for relief supplies that FEMA needs to get into the state. That's our major contribution to any recovery effort taking place in the heavily damaged earthquake zone in west Tennessee."

The other goal of the exercise is more immediate and that is to let people know what they will have to do to survive an earthquake.

"During a major accident, there's a hierarchy to a response – the government, then the neighborhood, then the family," Justice explained. "Well, during a natural disaster, it's just the opposite – it's the family, the neighborhood and then the government. The first responders may not be able to get there because they will probably be task saturated due to the wide-spread damage and not have enough resources to meet every number one priority. People need to be ready and prepared to rely on themselves for the initial critical hours or even days."

ATA Director of Support Services Pat Eagan (standing) runs the Emergency Operations Center (EOC) during the recent Great American Shakeout emergency response training exercise. He is gathering inputs from the subject matter experts who would occupy the EOC in the event of a simulated or actual disaster. (Photo by Andrea Stephens)

Johnson and Justice said the most critical actions to take during an earthquake are "drop, cover and hold on."

FEMA guidelines advise people, whether at home, work or anywhere else, to drop down to the floor, take cover by getting under a sturdy table or other piece of furniture and hold on until the shaking stops.

"After the earthquake [stops], as soon as it's safe and you get an all clear, then people should begin the recovery process," Johnson said. "The recovery process starts with taking care of injured personnel and then conducting a damage assessment of your facility, whether it's your home or whether it's your work facility, inside and out."

Regarding the New Madrid Seismic Zone, Justice said, "All the professionals think that there will be a catastrophic disaster along that fault line sometime in the future. About every 200 years there's a really intense earthquake, so they think we're due."

He added that the damage would be significant, a kind of "ripple effect" as electric, gas and water lines, highways and rail lines are destroyed or disrupted, bringing shortages in everything from gasoline to food and water.

"Even when Katrina occurred, oil coming out of the Gulf through those pipelines, was curtailed which impacted a lot of the United States," he said. "Additionally, experts say we can expect rolling electrical power outages for days and weeks.

"A lot of the buildings, unless they were built just in the past few years, are not built to seismic code. So, they anticipate that there will be a lot of structural damage, or buildings totally destroyed. There may be as many as 200,000 or 300,000 people homeless, just in Tennessee."

Man drowns in Woods Reservoir

By Jason Austin
AEDC Public Affairs

A 29-year-old Tullahoma man died Monday while swimming in Woods Reservoir at Arnold AFB.

George Mends was swimming with friends at the Gossick Leadership Center beach swim area. Mends remained in the water as the other swimmers headed toward the beach.

When they reached the beach Mends was no longer on the surface, and they called 911.

Arnold police, boat patrol and fire crews responded. After first responders and bystanders searched for a short period, the incident commander requested mutual aid from the Franklin County Dive Team, who recovered the body at around 7 p.m.

Boats from the Arnold Security Forces and the Tennessee Wildlife Resource Agency were on the scene supporting the recovery efforts.

No foul play, alcohol or drugs are suspected.

AEDC's Chaplain was on the scene and spoke with friends and family.

AEDC Security Forces took statements on the scene.

The beach is open to the general public, and non-AEDC affiliated patrons are required to check in with the Arnold Village gate guard. All guests are expected to do their part to keep the area safe and clean.

Education Fair scheduled for July 15

The Education & Training Office is hosting an Education Fair from 10 a.m.-2 p.m. July 15 in the Arnold Lakeside Center.

The fair will be open to all AEDC personnel, including DOD and ATA employees, as well as the public.

Several local colleges and universities in Tennessee and Alabama and others throughout the United States have been invited to provide employees and/or their family members an opportunity to career plan and possibly get enrolled for a new school year beginning in the fall.

So far 30 schools have confirmed they will be at the fair, and more are pending.

In addition to learning about degree programs from schools in the local area, employees and/or their family members will have an opportunity to see what college courses and programs are being offered, plus personally talk with school representatives.

For more information regarding the education fair, contact the Education & Training Office at 454-4313.

Master distiller visits AEDC

Jack Daniel Distillery Master Distiller Jeff Arnett, right, talks with a customer at the Arnold AFB Exchange May 6. Arnett was at the Base Exchange signing bottles for customers. (Photo by Rick Goodfriend)

RSVPs for banquet due by June 17

The 2011 AEDC Fellows Banquet will be held June 24 at the Arnold Lakeside Center.

The banquet is open to all who wish to attend to support the center's new Fellows and Lifetime Achievement Fellows.

RSVPs will be accepted through June 17. Cost is $30 and can be paid at Room A327 in the A&E Building. Checks should be made out to AEDC Protocol.

The social begins at 5:30 p.m., and dinner begins at 6:30 p.m.

New base entry requirements in place at gates

Access to the AEDC mission are now requires two forms of ID for all assigned personnel.

In addition to the current AEDC badge, the Common Access Card (CAC) must be used in accordance with Homeland Security Presidential Directive -12. Once inside the gate, only the AEDC badge must be displayed.

If you forget or lose either credential, you will have to report to the visitor center before gaining access to the base.

Subcontractors, long-term visitors and other persons who do not have a CAC can get an Air Force Form 75 from the visitor center. the AF 75 must only be shown at the gate.

FLIGHT *from page 1*

were to measure loads on the head, torso and limbs and occasionally we might see a loss of an arm or a leg. We've done a large variety of testing to ensure the flight safety of both aircraft and missiles and occasionally their occupants."

AEDC currently does much of the pre-flight safety certification process for weapon separation testing of missiles and stores from parent aircraft as part of what is called the Capture Trajectory System (CTS) integration testing process.

Prior to the advent of computers at AEDC in the 60s, much reliance was placed upon slide rules and tables of typical aerodynamic properties as part of the trade in preparing for tests, Peters said. Because computational fluid dynamics (CFD) didn't exist at the time, experimentation was fraught with risk but the intent was to use ground test facilities over flight testing to gain a first level of understanding of risks and to reduce them prior to full-scale development.

Likewise, in development of the current test facilities at AEDC, smaller-scale model wind tunnels were built to assist in the design of the current larger facilities like 16T and 16S. Tunnels 1T and 1S were constructed and helped pave the way for the base's 16-foot-square tunnels. Likewise, Tunnels D and E were forerunners to VKF Tunnels A, B and C.

"We did not have CFD tools, so what could be done but to rely upon the work and theories of aerodynamicists such as [Dr. Bernhard] Goethert and [Dr. Theodore] von Kármán and their insights on the important features for the design of the facilities?" Peters said. "Pilot wind tunnels at AEDC were used to discern and discover the essential geometry and performance features for design. With the modern resources of desktop computing and processing, computational tools are continuing to be developed, which add a significant ingredient in risk reductions of testing in the wind tunnels."

The first PWT test was performed in June 1953 on a .03-scale model of the Bomarc missile for the Boeing company. It was conducted in a one-foot cross-section prototype transonic tunnel know as "PeeWee."

That tunnel was the predecessor for the 16-foot transonic tunnel 16T, which was completed in 1956. That facility is still in use today – a fact that ATA Flight Systems Product Manager Rick Bishop says is a testament to the engineers of that time.

"All of the rotary drive equipment is pretty much what came with it," Bishop said. "Improvements have been made over the years, but it's all pretty much the original design philosophy the whole way through."

16T can operate at transonic Mach numbers from .05 to 1.6. Its size allows for full-scale missile installations to test engine performance and airframe aerodynamics, as well as the capability to test parachutes or other decelerators. Its supersonic sister tunnel, 16S, is currently inactive.

PWT's four-foot aerodynamic wind tunnel, 4T, is capable of testing from subsonic to low-end supersonic airspeeds and excels in store-separation testing.

VKF contains three smaller wind tunnels: Tunnels A, B and C. They are used extensively to develop supersonic and hypersonic flight vehicles. Virtually every high-speed flight vehicle has required testing in VKF's facilities. Re-entry vehicles, space capsules, winged vehicles and X-series planes have all gone through testing there.

Tunnel A is capable of simulating Mach numbers ranging from 1.5 to 5.5 by use of a continuously variable nozzle that uses steel plates, similar to those in PWT's tunnels.

Tunnels B and C are hypersonic tunnels that can generate velocities of Mach 4, 6, 8 and 10 through the use of fixed conical-shaped nozzles.

Tunnel C offers aerothermal testing up to 1,440 degrees Fahrenheit for test articles like space vehicles.

"In VKF we've done just about as much work for NASA as anything," Peters said. "The space shuttle and a lot of the concepts that led up to the shuttle were tested there, and even some follow-up things that we're talking about … the Orion and Ares tests, most recently."

And while there are other facilities around the country, Phipps said AEDC's stand out in terms of the amount of data that can be gathered during a test.

"For our supersonic and hypersonic tunnels, there's really no near peer in production," he said. "There are other blowdown facilities that operate in those ranges and smaller test sections for those supersonic and hypersonic tunnels, but there's no peer in terms of both size and production."

In 1993, AEDC became involved with Pressure Sensitive Paint (PSP) technology.

The technique uses a special paint and illumination source combined with a sensitive camera to obtain surface pressure data. The light source excites the layer of paint, which fluoresces with intensity inversely proportional to the surface pressure on the model.

A system installed in 16T in 1999 uses the PSP data to determine surface pressure at several hundred thousand points on a model, as opposed to conventional instrumentation that is limited to several hundred pressure measurements.

This 30-foot compressor rotor was installed in AEDC's 16-foot transonic wind tunnel Oct. 10, 1955. Today wind tunnel 16T is still used for a variety of tests. (File photo)

A military pilot's career in the air can touch a wide variety of systems that were tested at AEDC – from the T-38 Talon used as a trainer for fighter pilots to the F-35 Joint Strike Fighter Lightning II currently being tested in the field.

"We test for the Air Force, Navy and Army, and we do some work for commercial customers," Bishop said. "Most of our testing in the last couple of years has been Air Force and Navy, including extensive testing for the F-18 program. We've supported several other smaller programs during this time, including test programs for the F-15 and various missiles for the Missile Defense Agency."

F-35 development was completed after more than 10,000 hours of wind tunnel testing at AEDC, including aerodynamic and propulsion tests. Today, the center is still doing F-35 work in relation to store separation testing.

The next big project at AEDC will likely be a next-generation bomber for the Air Force.

"That's something that is at the top of Secretary Gates wish list, and he wants to field the capability into the mid-2020s," Bishop said. "We're expecting in the next year or so to start getting inquiries for ground testing to support that new bomber program, so that will be potentially the next large program we'll be involved in."

Phipps is also looking forward to the future of testing next-generation fighters and cruise missiles. Thinking back to the unmanned aircraft debates he used to hear on base, he said he thinks hypersonic vehicles may be on the same track – closer to a reality than anyone really suspects.

The work environment that a possible next-generation bomber or other future project would be brought into has changed over the last six decades. Although PWT and VKF do similar work, when both Bishop and Peters arrived the two facilities were managed independent of each other.

"Essentially, it was almost like different companies operating different facilities," Bishop said. "It was really one company, but there was a different management structure in each facility. Each one independently had their own set of test operations and facility and projects engineers. So while doing similar work, they developed a different philosophy and a different methodology for doing it."

Bishop said that has changed as budgets and the nature of work being done has changed.

"We're not doing as much facility research," Bishop said. "We're more into test data production than we are into development of the facilities, so we're trying now to blend PWT and VKF test methodologies into a single production model for all wind tunnels."

There are several modernization projects either underway or on the near horizon for the PWT and VKF wind tunnels. They include putting in a new mechanism to allow for a larger pitch and roll capability for test articles in 4T, new actuators for the variable nozzles in 4T and Tunnel A, a new common data system, consolidating the control rooms for Tunnels A, B and C into one operations center, rewound drive motors, new starting systems and digital plant controls in the VKF main plant – bringing together some of the facilities developed in the days when multiple contractors such as Sverdrup, Calspan and Micro Craft Technology were working on base.

"We had Sverdrup and Calspan that operated these two areas, so PWT and VKF had similar functions but facilities and operations were quite different in look and feel," Phipps said. "But we have this modernization effort and everything's coming together. We're all one big team now, the look and feel of the transonic and hypersonic test business is becoming what we always wanted. I think that standardization of our test processes is going to be a great thing."

Today, the people who work at AEDC have that knowledge and, combined with the facilities on base, their decades of experience are what make the work that goes on here a success.

"It's maybe a little unusual in that many people have spent entire careers at this one location and have developed intimate knowledge of these facilities over those years," Bishop said. "And when those people leave you can feel the loss, because you have to go pick up with new personnel and re-plow all that ground and re-learn the protocols and test techniques critical to our business. People are the most important part of keeping the operation going."

When asked why people have remained at AEDC so long, Bishop said for him it's the reward of knowing he contributes to the defense of the nation.

"America is the greatest nation, government and people that has ever existed," he said. "And I want to see that preserved for future generations. I would like to see a lot of these concepts – how we were founded and how we're governed – spread to other parts of the world and eventually get rid of the conflicts and differences that keep us apart. Preserving this manner of life is an important part of what we do here."

Peters aspired to be an astronaut when he was younger and also considered becoming a pilot in the Air Force. Instead, he chose a career that he said couldn't have been more rewarding from a technical standpoint. And with a son-in-law who is a Navy aviator, he says there's a sense of satisfaction in knowing that the work he does at Arnold is helping keep his son-in-law safe when he has to go overseas.

"We're not in the Armed Forces," Peters said. "We don't wear a uniform to protect our country. But in a way, we protect our country by providing the information that is needed to give the Armed Forces the tools they need to continue preserving freedom."

ROGERS *from page 1*

Bob Rogers, 13th from left, is among those honored for five years of service with ARO in December 1961. (File Photo)

Rogers also holds another distinction: he has worked in the same building, the von Kármán Gas Dynamics Facility Compressor Building for all of those years.

"[I started out] upstairs in the old portion of the building," Rogers said. "The high pressure addition (HPA) portion was added in 1970. I moved to this corner of the office at that time and have been here ever since."

Currently as a member of the ATA Materials Control Team, he is the inventory manager of 16 active bench stock areas. Rogers also works with system engineers and maintenance managers to help establish spare parts for their assets. A large percentage of his time is spent with data collection and analysis involving materials and services.

With all those years on the job, Rogers enjoys what he does.

"Not only is the job interesting, it's challenging – new things happening every day – welcome to the world of material management," he said. "And the people I work with are so great – not only the members of the Materials Control Team, but folks like the people here in the office and shop. You couldn't ask for a better crew to work with.

"I've had some wonderful supervisors over the years. My current supervisor, David Uselton, and I had worked together on various projects for many years prior to him accepting the position of Materials Control manager. Dave has assembled a good working team and the Materials Control members are all constantly striving to make improvements to provide better support to our customers."

Even though he has been involved in some form of material management his entire career, Rogers' job has changed incrementally over the years. He has added more responsibilities and dropped a few, but the biggest change has involved technology.

"Just from my little corner of the world we see things like how we started out banging on typewriters and came up through the computer age from dumb terminals into the much more sophisticated machines that we have now," Rogers said. "Our first 'computer' in this office was the size of a desk, and when you typed on this monster you could hear it all over the office. It actually recorded onto a tape spool on the side of the machine instead of a hard drive. Our first real copy machine was a Thermofax hand-me-down from the commander's office – actually nothing more than a light bulb in a box using thermal paper – but that was pretty hot stuff for its time."

But Rogers likes the technology and said it has made his job easier.

"Oh, yes, definitely," he said. "And it's interesting. I like to stay abreast of things," pointing to his new, personal Apple iPad lying on his desk.

Rogers works from 6 a.m.-2:30 p.m., but he arrives even earlier.

"Normally I get here about 5:30, about the time they open up Gate 2 every morning and get to talk with the guard for a few minutes when I come in," he said. "Those guards are some of the most unappreciated people in the world, I think, because they do a fantastic job. Not only are they concerned with the security of the base, they always take time to smile and greet you as you enter the gate. That gives you a great start to your day."

Even when he's not working, Rogers keeps busy. He enjoys jogging, playing piano and organ, reading and doing his genealogy research.

"My church family plays a large part in my life," Rogers said. "I joined First Christian Church (Disciples of Christ) in Tullahoma in 1950, have been a member of the chancel choir for 61 years, been playing the piano for worship service for the past 17-to-18 years, work with the food pantry and currently am the chair for the Memorials Committee."

People often ask Rogers about the prospect of his retirement, but that is a subject not even on his radar.

"What's retirement?" he asked. "No, I don't really have any plans for it now. The Lord's been good to me and given me good health all my life, so with good health, I don't really have any plans for retirement as long as I can continue to provide assistance to our customers."

Rogers says he is very optimistic about the future of the base.

"I'm looking forward to even greater things happening for ATA and AEDC."

ATA maintains ISO certification

By Shawn Jacobs
Aerospace Testing Alliance

ATA's management system has maintained its certification by the International Organization for Standardization (ISO).

The company was last re-certified by ISO in May of last year.

ATA's second external ISO 9001:2008 surveillance audit for this certification period was conducted May 3-5 by ISO registrar Det Norske Veritas (DNV), one of the world's leading certification bodies. The Asset Management, Integrated Scheduling, Work Force Management and Information Services core processes were audited, according to J.T. Northcutt, ATA quality manager.

"I would like to thank each of you who participated in this audit and the open and honest dialogue that you had with the auditor," Northcutt wrote in a company e-mail. "Your professional attitude and integrity were paramount to the outcome of the audit and the benefits received from the audit."

The audit revealed no major or minor nonconformances to the ISO quality standard for ATA's management system requirements. Twelve noteworthy observations were identified with eight opportunities for improvements.

This was the second consecutive audit for this certification period, marking a total of eight consecutive audits in which zero nonconformances were found.

"Due to the positive results of this audit, we continue to maintain our contract required ISO 9001:2008 certification," Northcutt wrote. "Many ATA employees are responsible for the outcome of this audit as our processes are inter-related and integrated functionally.

"The sustaining positive results of these external audits indicate continual adherence to our established company policy, procedure and work instruction requirements, which are vital in meeting the requirements of our customer and delivering the expected output of maintenance and operations of AEDC in a safe, effective and resource efficient manner. As we continually strive to improve AEDC, it is each employee's responsibility to identify requirements that are in error, create unnecessary barriers or waste of resources or material in accomplishing a task or process."

ISO is the world's largest developer and publisher of international standards. Based in Geneva, Switzerland, ISO is a network of the national standards institutes of 161 countries.

According to the ISO website, ISO 9001:2008 specifies requirements for a quality management system where an organization

• Needs to demonstrate its ability to consistently provide product that meets customer and applicable statutory and regulatory requirements, and

• Aims to enhance customer satisfaction through the effective application of the system, including processes for continual improvement of the system and the assurance of conformity to customer and applicable statutory and regulatory requirements.

MITCHELL *from page 1*

said from that moment on, he never looked back nor questioned his decision.

Dr. Mitchell came to AEDC in 1953 to work as an engineering aide the summer before graduating from Auburn. Working with some of the brightest engineers on a state-of-the-art ground testing complex during its early years left an indelible impression on a man determined to find his place in their world.

Describing his first impressions of AEDC, he said, "I loved it; everybody loved it. We had the world's best test complex and resources. At Arnold Center, all of us who worked there had a chance to produce data and information that nobody else could produce. You were welcome to give papers anywhere because, when you went to international meetings, you were right on top of the list there with your information and what you could do.

"So, I was very fortunate in riding the crest of the aerospace wave in this country, starting in the early 1950s.

You got on that wave, we did not have a resource problem and it was a great place to work and a great time to work in this business."

Before and during his college career, the Korean War was underway.

"I graduated from Auburn on a Thursday, March 1954, and they handed me my lieutenant bars and my bachelor's degree within an hour of each other," said Dr. Mitchell, who had enrolled in the school's ROTC program. "And the following Monday I am at an Air Force base [Wright –Patterson AFB] just that quick."

Originally, Dr. Mitchell planned on going into the Air Force as a career and fly.

"The Air Force also had something going right then, every officer was going to fly an airplane," he said. "Well, at that age, that sounded great. I flew little light aircraft around the college town, Piper Cubs. The idea of them paying me to fly a jet sounded like the most wonderful thing in the world.

"Not knowing that you had to be on active duty a certain number of years before you applied to go, I went back and found some papers well before I even graduated or was commissioned and applied to go to graduate school."

Shortly after earning his master's degree in aeronautical engineering from the Air Force Institute of Technology, Dr. Mitchell, found that a career in the Air Force was not to be.

As the Korean War was winding down, the Air Force was not actively pursuing anyone to become a pilot.

"So, having been so nice to waive all the requirements before, I applied to go to flight school and the word I got back was no, you have to put in three years payback for the year and half schooling you got which puts you two or three months over the age of 25 which is the limit for going to flight school," he recalled. "And I said OK guys; you've convinced me that you don't want me in the Air Force."

Dr. Mitchell, who had returned to AEDC in 1955, took off his uniform in 1957. Then he began to look for a job in the civilian sector, but he wanted to remain at AEDC if possible.

"I got offered a job in the Engine Test Facility and Gas Dynamics Facility," he said. "Arnold Center offered me what I considered the most interesting job."

Dr. Mitchell began his civilian AEDC career at the von Kármán Gas Dynamics Facility, as a test engineer in tunnel B.

"The initial facilities were, of course all this support stuff, but that goes without saying. But the Engine Test Facility, the basic engine test facility, those cells have now been closed, the T-cells. The von Kármán facility, with its Tunnels A, B and C, were, still are, uniquely qualified.

"Nobody else has supersonic and hypersonic tunnels of that size that run on a continuous basis. They were great opportunities. Propulsion wind tunnels 16S and 16T were and still are unique. Nobody else has a 16-foot transonic tunnel and it's probably one of the busier tunnels AEDC has still."

After two years into his career at AEDC, Dr. Mitchell said he made an important discovery.

"I found out something as a test engineer and found out a lot about myself," he said. "I was working in Tunnel B. We ran on the second shift, always. Found out two things, I didn't want to spend my life working the second shift. I never saw my young kids. When they were home, I was asleep. When I was awake, they were in school. The other thing I found out was I only knew what was going on in my tunnel and the test I was running. I found out that my interest was much broader than that. I wanted to know what was going on everywhere and have an input into it if I could."

Dr. Mitchell, who retired in 1988 as the center's chief scientist, said he more than fulfilled his goal of having an impact on AEDC as a whole. He recently reflected on what impact AEDC has had on the nation.

"AEDC's legacy is making possible some of our best weapon systems over the past 50 years," he said. "We can point out example after example of where the testing data we have taken at AEDC has permitted things to be built that probably couldn't have been built otherwise. We couldn't have afforded to build them otherwise."

Dr. Mitchell said the most productive parts of his career were when he was in charge of facility planning.

"Some very good engineers with both the Air Force and contractor joined to plan a number of the facilities seen out there today – the Aeropropulsion Systems Test Facility (ASTF), the Aerodynamic and Propulsion Test Unit (APTU), Mark 1 Test Facility and J-6 Large Rocket Motor Test Facility; basically anything that was not part of the original plan."

According to Dr. Mitchell, from the beginning ASTF was not supported by many in Washington because it was considered too big and too expensive.

AEDC Vice Commander Col. William L. McCulla shakes the hand of Lt. James Mitchell, after pinning the junior officer with his 1st lieutenant bars in 1955. (File Photo)

"I ended up being the guy who was given the job to go to Washington and convince the Air Force, DOD and Congress to find the funding for this facility," he said. "No one thought we would succeed, and I wasn't sure myself, but with the support of some key individuals, it all came together. At that time, ASTF was the most expensive military construction program (MCP) project ever attempted."

Dr. Mitchell is an internationally recognized expert in aerospace ground testing and a former U.S. member on the Propulsion and Energetics Panel of the Advisory Group for Aerospace Research and Development (AGARD), the technical arm of the North Atlantic Treaty Organization (NATO). He effectively campaigned to reduce the cost of testing at AEDC while improving test and evaluation quality, which included his relentless and successful advocacy to fund ASTF.

Mitchell, who began his AEDC career in 1958, was chief scientist at the center from 1983-88, when he retired and accepted a job with Micro Craft Inc. in Tullahoma, Tenn.

While at Micro Craft, Inc. he provided the senior technical leadership in positions that included director of technical services; executive vice president - chief operating officer; Manager of Micro Craft Technology, a joint venture to operate the aerospace test facilities at AEDC. He also served as president and CEO of Surface Treatment technologies, a spin-off from Micro Craft, Inc.

He is recognized as one of the nation's leading authorities on aeronautic ground test facilities. He has 55-plus years of experience in the aerospace industry.

Dr. Mitchell served on more than 20 of the nation's most prestigious advisory boards, study groups and governmental agency committees including the Air Force Scientific Advisory Board; National Research Council Aeronautics and Space Engineering Board Committee for review of aeronautical and space facilities; past member of the AGARD Propulsion and Energetics Panel; and Director of Research, Test and Evaluation Space Facilities Study for NASA.

He has more than 30 major publications, technical papers and seminars relating to aeronautics ground testing to his credit. He has received many of the nation's major professional awards and received the French "Medaille de l'Aeronautique" for contributions to international aeronautics in November 1987.

Besides graduating cum laude from Auburn University, he also holds a master's degree in aeronautical engineering from the Air Force Institute of Technology; a master's in mechanical engineering from the University of Tennessee Space Institute, and a doctorate in mechanical engineering from Vanderbilt University and completed the Senior Executive Program at the Federal Executive Institute in Charlottesville, Va.

AIR SHOW *from page 1*

coordinate the air show. "Our partnership with the community links us."

During the 1970s, AEDC workers tested two potential power sources for the A-10. Store separation tests were also run on two A-10 prototypes, and tests helped determine the munitions that would be incorporated into the program. Even though Captain Shetterly was only at AEDC a year, he is well aware of the work that was done for the program and spent time in the wind tunnels as a construction project manager.

"It's exciting to come back to Arnold, where I worked before and contributed so much to the ongoing and safe operation of the facilities there and realizing how much over the years has been developed there – not just in the A-10, but every military flying machine and mainstream flying machines as well," he said. "So it's kind of a full-circle opportunity to have worked there before and get to fly there years later in the air show."

The Kiwanis club has been putting on an Independence Day fireworks show for 42 years, according to Independence Day Celebration committee chairman Mike Rutherford. Two years ago, it was canceled because the location at Tullahoma High School's football field was condemned.

The club approached the airport about hosting the event, but the only way it could be done was if there was an air show component. From there it grew into an event that was attended by an estimated 7,000 people last year, Rutherford said.

"It's a case of where the tail is now wagging the dog," he said. "I think maybe people know us better for the air show now than they do the fireworks, which is fine. It's all to celebrate Independence Day."

Arnold AFB's involvement the last couple of years has been limited to loaning fencing and other equipment for the show, but for the base's 60th anniversary Kiwanis club members asked AEDC Commander Col. Michael Panarisi if the base would like to contribute to the show.

"When he gave a stamp of approval, that greased the skids for us to start finding acts to perform in the show," Rutherford said.

Murray King, AEDC's flight systems plant asset manager, is also helping with the air show coordination and has helped the Kiwanis with past shows. He said everything came together to make what will be a memorable base contribution to the air show.

"This year it was just a perfect match that our 60th anniversary came up, and the A-10 had accepted the invitation to come to the show," he said.

Captain Shetterly said he had been looking for a reason to come back and fly in Tullahoma. When he found out through friends that organizers were looking for an Air Force demonstration, he jumped at the chance to make it happen.

"I've been asking them and saying 'Hey, I've got two years as a demo pilot and if you guys are going to have an air show, it would be a lot of fun,'" he said. "So I basically facilitated the opportunity to come there and fly for the show and worked the angles through the schedulers on our end and told them it would be an event that would be special, with my history at Arnold and getting to come back and fly for the show."

Another special outcome is that Captain Shetterly will get to fly in an air show with his father, who will be giving a demonstration of a DR-107 One Design experimental aircraft that father and son worked on for more than a decade.

Captain Shetterly's A-10 also will fly in formation with a P-51 in a heritage flight that commemorates the history of aviation.

"It's choreographed to music with a narration provided by Air Combat Command," King said. "It's very nice. It'll wet your eyes."

Gates at the airport open at 3 p.m. July 1. The event is free and open to the public, but Kiwanis will take donations after the event. Concessions will be for sale, but attendees may bring their own coolers. People also may bring lawn chairs, tents and umbrellas. No glass bottles or alcohol are allowed, and no pets will be allowed in with the exception of service animals.

There will be live music and several aircraft on display. AEDC will have two tents set up with information about the center and the A-10's history.

Festivities kick off at 6 p.m. with the pledge of allegiance. Fireworks are expected to take place around 9 p.m.

King said while it's not on the same scale as some of the air shows he organized in the last decade, he believes it will be a memorable experience.

"I was standing out in front of the crowd on June 23, 2001, when the Thunderbirds overflew and performed at Tullahoma for the AEDC 50th Birthday Celebration Air Show," King said. "I heard a 12-year-old boy look up and say 'That's what I'm going to do when I grow up.' And hopefully, with this show we can recreate that excitement when they see the A-10 demonstrating its performance and air-to-ground superiority. Hopefully we can hear that again."

Milestones

Paul Jalbert
ATA, 35 years

30 YEARS
Deborah Jackson, ATA
John Bowden, ATA
Dale West, ATA
Bobby Smith, ATA
Michael Phillips, ATA
Lanny Holt, ATA
David Rollins, ATA
William Wendle, AF

25 YEARS
Michael Smith, ATA
Sharon Pegram, ATA
Richard Martin, ATA
Karl Nation, ATA
Joel Kennerly, ATA
Wilbert Eppenger Sr., ATA

20 YEARS
Charles Dye, ATA
Scott Waltermire, AF

15 YEARS
Tommy Farless, ATA
Michael Riddle, ATA

10 YEARS
Clint Shetters, ATA
Daniel Ayres, ATA
Brandon Stiles, AF

5 YEARS
Jerald Walls, ATA
Chris Bidmead, ATA

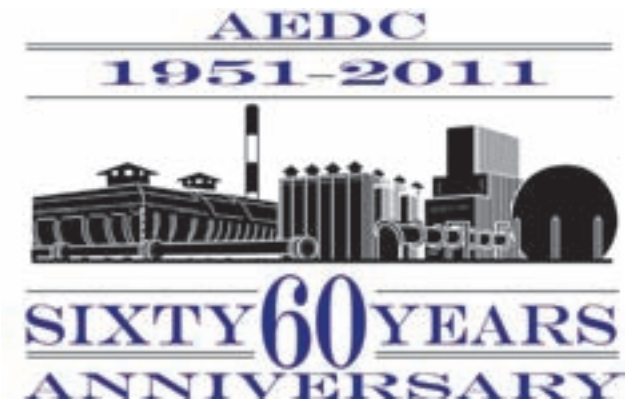
OUTBOUND MILITARY
Capt. Scott Rinella, AF

NEW HIRES
Robert Sindorf, ATA
Matthew Ashby, ATA
Richard Checchin, ATA
Kiersten Warren, AF
Steven Snipes, AF
Aleene Falk, AF
Mike Walton, AF

PROMOTIONS
Johnny Jackson, ATA
Frank Hayworth, ATA

GRADUATE/DEGREES
Gene Reed, Premier, General Machinist Diploma

Remembering those who died serving AEDC



By Patrick Ary
Aerospace Testing Alliance

A photograph is still pinned up on a wall in AEDC's Model Shop today from when John Hill, left, and Alvin D. Overman, second from left, received an ARO award. Overman and Hill died in 1971 after they entered a confined space in the Model Shop area, not knowing argon gas had leaked inside. The date on the picture indicates it was taken almost exactly a year before they died. Hill and Overman's names are etched into a monument along with 13 other names of people who lost their lives in service to AEDC. (Photos by Rick Goodfriend)

It's an incredible amount of information on its own: the names of people who lost their lives on the job at AEDC over the last six decades.

Many employees at AEDC learned those names during Beyond Zero orientation, when former ATA general manager Dr. David Elrod visited their class. But he gave them more than a list of names.

He also told them ages, locations and causes of the 16 recorded deaths. They learned spouse names and how many children were left fatherless in each family. They even learned when Charles Neil Stratton died on June 5, 1958, it was a Thursday.

Dr. Elrod is able to give all of this information without referring to a Powerpoint presentation or a spreadsheet. He didn't carry a scrap of paper with him into class.

All of this information is burned into his mind after extensive research that included going through newspaper archives and talking with people who knew of the incidents firsthand.

"I didn't set out on the journey though to try and develop a presentation," Dr. Elrod said. "It was really trying to understand piece by piece what happened to these folks, and over time it kind of emerged into something you don't forget."

Stratton, the first recorded fatality at AEDC in 1958, was a 30-year-old Marine Corps veteran working as a craftsman for Arnold Research Organization, the main contractor on base at the time. He was working at the Engine Test Facility's (ETF) "boondocks" area, behind the current J-4 test area. The valve from a k-bottle became overpressured and failed, striking him in the head. Stratton, who had a wife and daughter, died at Vanderbilt University Medical Center without regaining consciousness.

On Dec. 17, 1962, four men died during construction of the J-4 facility. At 4 p.m. on that Monday afternoon, steel scaffolding that was holding up 840 tons of freshly-poured concrete collapsed. The four men – W.A. Anderson of Beech Grove, Ernie Beitel of Manchester, Woodrow Darden of Normandy and William D. Lowrie of Monteagle – fell about 250 feet to their deaths. Several other people were hurt, but the accident happened during a shift change and the area was not as crowded as it had been minutes before.

"That's one where I always pictured it being just before Christmas and the cold weather coming in, folks wanting to get construction done and kind of in a rush of doing the job," Dr. Elrod said. "That likely had some contribution to it."

Another person would not lose their life at AEDC for almost three and a half years; then, there was another deadly fall at the J-4 facility. ARO carpenter Wayne McBee, 33, Estill Springs, was working in the J-4 spray chamber when he fell 180 feet from a scaffold. He apparently wasn't secured to the scaffold.

"As in a number of these cases, safety practices that we require today weren't in place then," Dr. Elrod said. "I don't know other details other than he fell to his death in the chamber. He had three young daughters at home."

On May 25, 1970, ARO craftsman John Serafin, 54, of Murfreesboro, was seriously injured when he opened a valve at the Engine Test Facility and an oxygen hose ruptured. According to reports, Serafin was treated for shrapnel wounds in Coffee County Hospital in Manchester. He asked to be transferred to Rutherford Hospital in Murfreesboro and died on the way there. The retired Air Force sergeant had a wife and six children.

Two men died in the next incident on Dec. 10, 1971. John T. Hill, 41, Decherd, was working with two other

See **DEATHS**, page 12

From soldier to pipefitter, retired employee has seen AEDC from all angles

By Shawn Jacobs
Aerospace Testing Alliance

When Jack Boyer arrived at Camp Forrest in 1941 with the Army, he never dreamed that his journey would take him full circle: overseas with the Army and back for a career at Arnold Engineering Development Center (AEDC).

Now the 92-year-old Manchester resident reflects on a life of satisfaction and contentment.

A native of Collinsville, Ill., Boyer said he joined the Illinois National Guard in 1940, expecting the United States would go to war because of the conflict in Europe. In March 1941, Boyer was placed in the regular Army and sent to "open up" Camp Forrest, which is now within the boundaries of Arnold AFB.

"In June of '41 there was a maneuver in this area, and they put me on detached service driving an umpire vehicle," Boyer said. "I drove a captain, and I don't know why I was on so much detached service in '41, but they made a chauffeur out of me. I spent very little time at Camp Forrest because I was on detached service so much. We did build some walks. It was so muddy when we came down here; we built wooden walks to stay out of the mud. As far as actual training now, I got very little training.

"We left Camp Forrest on Aug. 4, 1941, and went to Arkansas and Louisiana for two more months on another maneuver. We finished that maneuver and went to North and South Carolina for two more months and got back to Camp Forrest on Dec. 4 [1941]."

Boyer then had to have surgery on his leg to correct a varicose vein problem. After the attack on Pearl Harbor, the doctor told him he could get a medical discharge due to his leg, but Boyer declined.

"I said I got into the National Guard knowing that we were going to war," Boyer said. "I said I'd be defeating my purpose for getting in the National Guard if I got a discharge."

Boyer's unit, which became the 123rd Field Artillery, left Jan. 1, 1942, for 38 months overseas, first landing in Melbourne, Australia, then traveling to New Caledonia, about 800 miles east of Australia.

"I was on detached services, and I chauffeured officers a whole lot and I drove trucks," he said. "One of my main jobs was to haul stuff from the main port there and deliver it to where it had to go to."

Boyer was discharged from the Army in March 1945, and he returned to Manchester and soon married his first girlfriend, Catherine, whom he had met while he was at Camp Forrest. They were married for 63 years until her death. The couple had two sons about whom Boyer speaks proudly: Milton, of Manchester, a retired operating engineer from AEDC, and Joe, of Estill Springs, who still works at the center as an operating engineer.

And it was not long before Boyer was back in the area of Camp Forrest, except this time it was called AEDC.

"In 1952 they had [some] German motors at Northern Field in the hangar, and they wanted to make sure they were dried out before they put them on the line," Boyer said. "They went into ETF [Engine Test Facility]. I tried to get in the Electricians Local, and they wouldn't take me in the local but they gave a work permit.

"I went out there and we worked on drying those motors out for about two weeks. Some electrician had been working out of town and he wanted to come home, so I got rolled. So I said, 'To heck with it; I'll get in the pipefitters.' And I did."

Jack Boyer looks through an album filled with photographs from his days as a pipefitter at AEDC. Bower pictured at right below, poses with a control panel he helped fabricate for a venturi closure in the in the J-2 test cell on Oct. 16, 1970. (Top photo by Shawn Jacobs; bottom photo provided)

Boyer said pipefitting was not new to him, since he started doing refrigeration work in 1939. Prior to that, as a teenager, he had put in a water line across two yards to his house.

"I worked on construction out there at AEDC until 1964," he said. "I worked all over that area, and in 1964 I went to work with ARO [Arnold Research Organization]. I really enjoyed my work, and I thought I was good at it.

"For the most part, I worked in the Model Shop. I've had some big jobs. I was on a pretty good size job when I retired out there."

He said the base has changed dramatically since he retired in 1981. He only knows one or two people left at AEDC with whom he worked.

Boyer said he has always been good with his hands. He built his current house himself in the early 1950s but had to move it when the interstate came through. Even today he stays busy at a shop in back of his residence. Fans, battery chargers, microwave ovens, cameras – Boyer will try to fix almost anything.

"I repair lots of things in my shop out there," he said. "I get lots of things from the convenience center that's thrown away, and

See **BOYER**, page 15

Tech library showcases 60 years of pioneering work

By Philip Lorenz III
Aerospace Testing Alliance

Sixty years and more than 10,950 technical reports later, Arnold Engineering Development Center's Technical Library staff is doing its part to celebrate the center's 60th anniversary with a special display.

It features highlights from AEDC's engineers, who have written pioneering technical reports over the years that set the standards nationally and internationally in their respective areas of expertise.

Besides the photographic display, the staff members will also be running a video loop.

This work of documenting what was cutting-edge research and ground testing of aerospace weapon systems and space assets began as AEDC was conceived, dedicated and evolved into the world's largest aerospace ground testing complex.

One example is a technical report written by AEDC Fellow James Sivells (1978), titled, "A computer Program for the Aerodynamic Design of Axisymetric and Planar Nozzles for Supersonic and Hypersonic Wind Tunnels."

Wayne Hawkins, aerospace engineer with more than 30 years at AEDC, said, "This is the basis of supersonic and hypersonic wind tunnel design today."

Another example is a technical report written by AEDC Fellow Dr. Wheeler McGregor in 1976, titled "Assessment of Intelligent Content of Plume Spectral Radiation from Rocket Plumes."

See **DISPLAY**, page 15

IN FOCUS: Health and Wellness

A&E track open for runners

The new running track behind the A&E Building is now open for runners after a ribbon cutting May 25. The six-lane, 400-meter track has a rubberized surface and will be used to support current Air Force fitness initiatives and to encourage the health and well-being of the AEDC work force. Work began in August 2010 and was funded by dollars specifically earmarked for Department of Defense Fitness Operations and Maintenance Projects. Pictured at right are Air Force project manager Christine Hughes, AEDC Commander Col. Michael Panarisi, Mission Support Division Director Col. Robert Bender, former Chief of Services Rick Ferrebee, Base Civil Engineer Bill Wendle and ATA General Manager Steve Pearson. (Photos by Patrick Ary)

Karate class improves physical, mental fitness

By Philip Lorenz III
Aerospace Testing Alliance

David Zieja looks on as Don Gardner demonstrates a karate kick as Dr. Richard Roberts braces for the blow. (Photo by Rick Goodfriend)

Don Gardner, ATA's instrumentation and diagnostics section manager of the Technology and Analysis Branch, has taught a karate class at AEDC since 1993.

"Karate is a sport that can be practiced for life," said Gardner, who teaches the class on a volunteer basis. "If practiced consistently it can extend your peak physical performance chronologically. It continues to challenge you physically, mentally and psychologically at all stages and keeps rewarding you with self confidence befitting your personality type. I'm sure the same could be said about many physical activities."

Dr. Alan Hale, ATA, said the base's long-time karate instructor has been an inspiration to him.

"Sensei Don Gardner selflessly dedicated himself to teaching his students the art of karate," Dr. Hale said. "His instruction encompassed the how, the why and the when that the art might be effectively used for fitness, defense and protection. His humble spirit combined with his excellent and powerful mastery of the art provides a perfectly balanced environment for learning the art. Sensei Gardner's approach enables continued mastery of karate or a ready foundation for branching into the study of other martial art disciplines."

Dr. Richard Roberts, a DOD wind tunnel test project manager at AEDC, recently experienced a major milestone in Gardner's class.

"It was a big accomplishment to finally earn a black belt," he said. "There is a level of confidence that comes with knowing you can defend yourself if the occasion would ever occur. It doesn't necessarily feel as if I have finished something, but have just now learned all the skills needed to start perfecting the art."

Dr. Roberts who has studied karate exclusively under Gardner the past four and a half years, emphasized the motivation behind learning the martial art was originally to learn self-defense.

"I've since learned that karate entails much more; it teaches character, respect as well as flexibility, strength and mental acuteness," he explained. "We work out for about an hour and a half, twice a week. Physically it has improved my balance, flexibility and strength. The class is structured so that is provides a good combination of both strength training and cardio."

Dr. Roberts is quick to point out other benefits of learning karate.

"It is also good for the memory," he said. "There are many moves, combinations and routines or 'kata' to learn, and the ability to be able to recall this knowledge instantaneously in combat takes a quick, healthy mind.

"We also study some aspects of jujitsu and weapons training, which keeps things interesting by always offering new things to learn. It's interesting to learn the history of Shorin-Ryu karate, which has its roots [dating] back hundreds of years ago in Okinawa. There is a long lineage of masters each of who have left their mark on the art."

David Zieja, a recently retired Air Force communications specialist, is also one of Gardner's karate class students.

"I was introduced to the martial arts in 1965 when I started training in Isshinryu Karate Dojo in Jersey City, N.J., with Grandmaster Don Nagle," Zieja recalled. "Sensei Nagle lit the spark. Over the years I had studied many styles and they all have the basic concept. The difference is to find a program that works for you."

Zieja's goal was to achieve the level of black belt "in at least one style."

As it turned out, he chose tae kwon do in 1996 and later accomplished the same rank in the Shōrin-ryū style under Gardner.

"I had [first] achieved the level of black belt in 1996 at the age of 48," he said. "All the hours, pain and frustration I had endured could only be overcome by persistence.

"In 2003, I moved to Manchester feeling a bit out of place, not having a family here I needed to center myself. So, I started looking for a place I felt comfortable training."

After checking out several "dojang and dojos," Zieja learned about the karate course taught on base while reading an issue of High Mach.

"I spoke to Sensei Don Gardner and now I believe I've found a home," he said.

Originally, the class was informal and Gardner and his students met on base when they could. As the class's popularity grew, it became a more permanent feature at the Fitness Center.

The class is held from 3-5 p.m. Tuesdays and Thursdays on the main gym floor. For more information on these classes contact Gardner at 454-3497.

TRICARE Prime enrollment transfers for moving families

WASHINGTON (AFNS) – Active duty military members and their families who are moving to a new location can now transfer their TRICARE Prime military health plan enrollment with a simple phone call.

The enrollment transfer includes a new primary care manager best suited to the location of the service member's work, home and anticipated medical needs, officials said.

Moving service members should call their current regional health care contractor to transfer their family's enrollment, and include a cell phone number and email address. The new regional contractor will contact them within five business days after the relocation date to finalize the TRICARE transfer.

Officials emphasized that active duty service members and their families will not have to worry about coverage during the transfer process, because they are continuously covered under TRICARE. Once settled, officials said, they can confirm coverage on the Beneficiary Web Enrollment website.

Active-duty service members or family members who forget to notify their current regional contractor of their upcoming move still have the option to contact the new regional contractor to transfer enrollment over the phone, officials said.

Other options include transferring during military base in-processing, using the Beneficiary Web Enrollment site or downloading and completing an enrollment application, DD Form 2876, to mail. Service members and their families also can visit a local TRICARE service center.

Dispensary doctor offers tips for seasonal allergy sufferers

By Patrick Ary
Aerospace Testing Alliance

It's a common saying: "An ounce of prevention is worth a pound of cure." And during this time of year, people who are suffering from itchy eyes and runny noses would do well to take that saying to heart.

"I think there are many people out there who could prevent the physician's visit for allergies with the proper preventive measures," said Dr. Rob Tessier, Comprehensive Occupational Resources (CORE) physician at the Arnold AFB dispensary.

In the last two months there has been an increase in the number of people stopping by the dispensary with allergy-related problems, Dr. Tessier said. It's common at this time of year, when flowers and plants are blooming and releasing more pollen into the air. For some people, those allergy symptoms will continue through the summer because of grass pollen.

"Normally people can breathe these things in and be fine," Dr. Tessier said. "But in a person with seasonal allergies, the body sees these particles as a threat, and the body starts its own internal inflammatory reaction. In turn, that causes the symptoms that we see with allergies."

The main symptoms of allergy sufferers Dr. Tessier has treated include runny noses, watery eyes, congestion and coughing. Headaches and even sinus infections also are possible.

There are ways for those who suffer this time of year to get their allergies under control, Dr. Tessier said. The best way to avoid getting sick is to avoid exposure to the allergen, which can be difficult when those allergens are outside in the air.

Rolling up the windows while driving and keeping windows closed at home will help, since air conditioners filter out most of the particles.

Wearing a dust mask while outside, especially while working in the yard, can also help.

Another way to minimize exposure is to shower before going to bed at night.

"It tends to rinse the particles off of the skin and out of the hair and keep them from ending up in the bed material," Dr. Tessier said. "Some people actually do tend to have their symptoms flare up or increase at night."

One tip for people who have received advice on over-the-counter medication from a doctor in the past is to try and start treatment before the pollen gets in the air, Dr. Tessier said.

"If these people tend to get allergy symptoms around the same time each year, a lot of people find it beneficial to start the medicine a couple of weeks before allergy season," he said. "If you feel the symptoms may come on, it's a good idea to start on them before they become more pronounced."

There are a number of medicines that can be used to treat allergy symptoms, and many of them are available without a prescription. Dr. Tessier said he recommends medicine based on the symptoms.

Allergy sufferers can use medicines from their doctor but in more severe cases, they may require allergy shots.

"For this to be done, typically the person is evaluated by an allergy specialist," Dr. Tessier said. "They undergo specific allergy testing to find out what exactly they're allergic to. The shot treatment is tailored to the specific allergens they're allergic to, and the shots help desensitize the body to the allergic response. The ultimate goal is to decrease the person's sensitivity to the allergen."

There is a wide variety of symptoms that people suffer when allergies strike, and because of the wide range of treatment possibilities, Dr. Tessier recommends seeing a medical professional to determine the best way to treat symptoms. But once a treatment has been given, there should be no need to go back the next year if it works.

"We don't require or routinely recommend allergy sufferers come in to see us unless they have new symptoms or their current medication regimen is no longer or less effective," he said.

Going at Mach Tenn

Eric Bjorn, chief, Strategic Planning Branch, Plans and Programs Division, takes a moment during his warm up to talk with friends prior to participating in the Mach Tenn Triathlon Saturday, where he placed third in his division and 81st overall. Many Team AEDC members took part in the triathlon either as participants or as volunteers, including the center commander, Col. Michael Panarisi, whose relay team came in first among the relay teams. The Mach Tenn is held annually at Arnold AFB the first weekend in June and is organized by the Mach Tenn Running Club. Anyone interested in the club can visit their website at *http://MachTenn.org*. (Photo by Jason Austin)

DEATHS *from page 9*

men in an offline furnace at the Engine Support Facility. Hill entered the furnace first and fell down, unconscious. Alvin D. Overman, 51, Tullahoma, went in to help and also passed out just seconds after entering. Attempts to revive both men ultimately failed. It was later determined that argon gas – which has no color or odor – had leaked into the furnace.

Dr. Elrod says Hill's and Overman's deaths serve as an example of danger lurking somewhere that appeared to be relatively safe. Today, anyone entering a confined space goes through a series of procedures. One person goes in first to sample the air with a meter to make sure it's breathable. That person wears a harness so if something happens, they can be pulled to safety without anyone else entering the space.

"Those three things – confined space entry, gas sampling and the harness system – none of those were requirements at that time," Dr. Elrod said. "Any one of them could have helped result in a different outcome."

AEDC would go almost seven years without another fatal incident on base. Then on Aug. 4, 1978, 58-year-old Thomas Himebaugh of Fayetteville would be involved in an accident at the Aerodynamic and Propulsion Test Unit (APTU). Himebaugh, a pipefitter, was doing routine maintenance work in a heater pit when a large metal box lid fell from 48 feet above and struck him.

"It's amazing," Dr. Elrod said. "In APTU, they have 4,000-psi air and combustible gases, extremely hot temperatures, extremely fast gas velocities as they test hypersonic propulsion systems – they have almost every danger you can imagine. The only fatality that's ever occurred there had nothing to do with any of those hazards. It was something you could book as a housekeeping issue of just securing objects. And it's the same kind of hazard we have today with folks who have to work with somebody above them. We walk out in the industrial area today and folks are working at heights. It's not something we list as the biggest hazard, but it can have fatal consequences."

Four people would lose their lives on Nov. 27, 1982, at the J-4 test cell. Three Aerojet employees from California – 57-year-old Dona J. Roy, 49-year-old Murray A. Tauscher and 58-year-old Arthur Totten – were in the bottom of the cell cutting up solid rocket fuel from a failed rocket test. The fuel ignited, causing an explosion that also killed Sverdrup outside machinist John P. Sipe, 52, of Summitville. Sipe was standing guard at a door to keep unnecessary personnel from entering the area. He happened to be in the wrong place at the wrong time.

"One of those aspects of this story that always struck me is that was not John's assignment for the day," Dr. Elrod said. "It was another person's assignment to serve as guard. The other guy who was supposed to be serving as guard just needed to take a break. I don't know if it was to get a cup of coffee or go to the bathroom – don't know what it was. John was walking by and he asked John to take his place for just a minute. It was just a few minutes after he walked off that this event took place."

Sipe left behind a wife and four sons.

Another fall took place on Halloween in 1984. Larry Childers, 38, Tullahoma, was working for a subcontractor painting a crane at J-4. He fell 120 feet from scaffolding. From all indications, Dr. Elrod said, Childers was not tied off when he fell. Not long before the accident, an ETF worker concerned about the work tried to intervene – but was not successful in his efforts to insist on using greater caution.

"I talked to him just a year or so ago, and he still carries that struggle with him," Dr. Elrod said. "When he intervenes with people on safety issues, he won't let go until people really listen. He tried then, but I suppose it's that piece that sticks with all of us: when you see somebody do something that's risky and you want to help out, how far do you go in stopping and getting their attention? Our obligation is to do whatever it takes."

The last fatal incident on base was April 23, 2001, at the Propulsion Wind Tunnel Facility (PWT) Model Installation building. Arcenio Avila was a Guatemalan native working for a subcontractor that was demolishing the roof. Someone had removed an exhaust fan during the night and the safety barrier was missing. As Avila backed up with a wheelbarrow, he tripped and fell through the hole where the fan had been. Avila had been in America three weeks.

Those 16 deaths are the ones that have been recorded. According to Dr. Elrod, there have been five others in three separate incidents. Two of those incidents apparently happened at AEDC in the 1950s and 1960s, and one other incident at the Tunnel 9 facility in White Oak, Md., in the 1970s cost two people their lives. Efforts to find documentation or people who remember those incidents have been unsuccessful – a point that hits home with Dr. Elrod.

"I struggle with how short-lived our memories are of those kinds of things – how quickly we sometimes lose that information," he said. "If it was your dad, grandfather, whatever, and you stopped by and folks didn't have that sense of where it happened and the sorrow that your family's life was impacted … we just owe that to folks."

Great strides have been taken in workplace safety since 1958, which was 12 years before the Occupational Safety and Health Act that created OSHA. Even the smallest advances in safety – such as ensuring an employee working more than four feet off the ground is tied off or that barricades are recognized – can have a huge impact, Dr. Elrod said.

But what can't be eliminated are the hazards many employees still have to work around today. There are still non-breathable gases used. People still have to work at great heights above ground. There are still high-pressure systems in operation. They are hazards that come with the nature of the work done at AEDC. The safety methods developed and in use today are all aimed at keeping workers safe around those hazards.

"Even though sometimes we focus hard on what seem to be minor injuries, it's more on getting the process right with the belief that process prevents big and small – and the belief that once an instance starts to unfold, we don't control the outcome," Dr. Elrod said. "Once that plate in APTU started to fall, nobody had control of whether it was going to hit somebody or not. Our intervention opportunity is really before the accident ever starts to unfold."

But AEDC's employees see the need for safety procedures and have a broad and common acceptance for the need to look out for each other, he said. And that's what makes him proud of AEDC.

"I'm very positive about the recognition and priority that's given to the value of individuals here," he said. "Arguably, one of the most important accomplishments we achieve each day is enabling our co-workers to go home at the end of each day whole – to live out their lives with family and friends and loved ones without ever facing the trauma of a major accident here. And there is a collateral benefit as well: the fact that strong safety habits and culture instilled here get carried home and as a result are safekeeping for people who aren't employees here – the family members or friends of co-workers. It means a lot to think that good people here touch lives of others in such a meaningful and positive way."

Arnold Golf Course
454-7076

Check out Arnold AFB Golf Course on Facebook!

Arnold Golf Course Customer Loyalty Program

Arnold Golf Course has established a new Customer Loyalty Program for golf advanced green fee players for the 2011 season. Purchase an annual green fee at Arnold Golf Course for 2011 and receive:

– 10 percent discount on Pro Shop merchandise
– 10 percent discount on cart rental
– 10 percent discount on Driving Range tokens
– 10 percent discount on food and beverage purchases at Mulligan's Coffee Bar & Grill

These discounts will be good during the 2011 season, which runs through March 2012. This discount program is not to be used in conjunction with the Members First Plus discounts. Maximum discount allowed is 10 percent. Sale items and alcohol are not authorized for these discounts. Come by to purchase your annual green fee and get your card for a year of savings.

A **Member-Guest Tournament** has been scheduled for June 25-26 beginning with 8 a.m. shotgun start both days. The format is two-person scramble. Entry fee is $125 per team and includes green fees, cart, food and prizes. Sign up in the Pro Shop by June 22.

Arnold Lakeside Center
454-3350

Books Are Fun is back for a **book fair** from 9:30 a.m.-3 p.m. June 22 in the A&E Building's new training rooms, A125 and A127. Discounted selections include paperbacks, best sellers, educational, reference, cookbooks, children's items, gift selections and more. Save up to 70 percent off retail prices.

Arnold Lakeside Center has planned an evening getaway to **Chaffin's Barn Dinner Theater** in Nashville June 24 to see "Everybody Loves Opal," a comedy by John Patrick. Opal Kronkie, a middle-aged recluse, lives in a tumbledown mansion at the edge of the municipal dump. The general disarray of her establishment is aggravated by the fact that Opal collects anything that can be toted home in her little red wagon. Into her rather strange world come three outlaws on the lam from the authorities. The crooks decide that what Opal needs is plenty of insurance, a rapid demise and three beneficiaries (themselves). The unsavory trio concoct several elaborate schemes to "do in" Opal, but each one backfires. Through it all, Opal radiates kindness, affection and an abiding faith in the goodness of human nature. Enjoy dinner before the show and then watch as the real magic begins when the lights dim and the stage descends from the ceiling. Cost is $55 and deadline to sign up is June 9 ($60 if signed up June 10-16). Depart from the ALC at 4:45 p.m. and return approximately 12 a.m. This trip has all the elements for an outstanding night of fun located in one building and with transportation provided at a great price. Chaffin's Barn Dinner Theater is rated one of the top 25 tourist attractions in Nashville. Call Melissa at 454-3303 to sign up for the trip. There must be a minimum of four to go, and maximum participants allowed is 20.

2011 Club Membership Scholarship Program is underway. Members First Plus members and their family members who have been accepted by or enrolled in an accredited college or university for entry during the fall term as part-time or full-time are eligible to enter. There will be 25 $1,000 scholarships awarded during this program. To enter you must write a 500-word essay on "My contributions to the Air Force" and submit to Services Marketing, A&E Room C303, by July 1. Along with the essay, complete the entry form and provide current college/university acceptance letter for new students or official transcripts for those already enrolled. Winners will be announced on Sept. 16. For more information visit ***www.afclubs.net.***

Wednesday Lunch is available for dine in or carry out 11 a.m.-1 p.m. Call ahead to 454-5555 to place orders. No delivery available. For better service, you may call on any day and preorder. Regular menu items available during lunch include specialty burgers, chicken tenders, salads and stuffed breadsticks. Call to see what other specials are available each week or check Sharepoint.

Second Friday Karaoke will be 6-10 p.m. June 10. All ages are welcome from 6-8 p.m. but 8-10 p.m. is reserved for adults only. Dining room special will be baby-back ribs, full $18.95 member, $19.95 nonmember, half $13.95 member, $14.95 nonmember served 4-9 p.m.

Movie nights are every Thursday with movie start time of 6 p.m. and dinner available from the Express or Pizza menus from 5-8 p.m. The schedule for June is: **June 16** – "Diary of a Wimpy Kid: Rodrick Rules," rated PG starring Zachary Gordon. Back in middle school after summer vacation, Greg Heffley and his older brother Rodrick must deal with their parents' misguided attempts to have them bond. **June 23** – "Limitless," rated PG-13 starring Bradley Cooper and Robert De Niro. An action-thriller about a writer who takes an experimental drug that allows him to use 100 percent of his mind. **June 30** – "Rango," rated PG starring Johnny Depp and Isla Fischer. Rango is an ordinary chameleon who accidentally winds up in the town of Dirt, a lawless outpost in the Wild West in desperate need of a new sheriff.

Friday night dining room specials available from 4-9 p.m. June 10: Baby-back ribs, full $18.95 member, $19.95 nonmember, half $13.95 member, $14.95 nonmember. Second Friday Karaoke 6-10 p.m. **June 17:** Gouda and bacon stuffed pork chops, $9.95 member, $10.95 nonmember. **June 24:** All-you-can-eat spaghetti and meatballs $10.95 member, $11.95 nonmember. All specials and times are subject to change without notice. Please call ahead to ensure availability and openings.

Saturday availability and specials: June 11: New York strip with parmesan-dusted mushrooms, $18.95 member, $19.95 nonmember. **June 18:** Butterfly shrimp, $10.95 member, $11.95 nonmember. **June 25:** Prime rib for two, $29.95 member, $31.95 nonmember. The dining room is open on Saturdays from 5-9 p.m. unless otherwise specified. All specials and times are subject to change without notice. Please call ahead to ensure availability and openings.

Walt Disney Salute to Armed Forces now through Sept. 24, 2011. Discount tickets are available to active or retired military including activated members of National Guard and Reserves plus active or retired members of Coast Guard. A four-day park hopper or four-day base ticket with water park is $133, and a four-day park hopper with water park is $160. Maximum of six tickets per person. Blackout dates are Dec. 27-31, April 17-23, 2011 plus July 4, 2011 at Magic Kingdom park. Call Melissa, 454-3303, at Information, Tickets and Travel (ITT) for more information about these and other tickets.

Family Member/Youth Programs (FamY)
454-3227

Camp Adventure is a 10-week summer day camp for ages 5-12 sponsored by the Services Community Flight and run by skilled professionals through the University of Northern Iowa. Activities are held Monday through Friday 7:30 a.m.-4:30 p.m. The camp will run from May 31 to Aug. 5. Children may attend any or all of the 10 weeks; however, we ask that attendance information be completed at time of registration.

Each week is set to a theme and activities and field trips are planned to coincide with that theme. Only a.m. and p.m. snacks will be provided. Parents must supply their child with a sack lunch daily. Please do not send carbonated beverages of any kind to camp. Please ensure that lunches are clearly marked with your child's name. Cold items can be accommodated in our central refrigerator; however, we will not be able to heat any meals. Please keep this in mind when determining your child's lunch.

Outdoor and swimming activities are planned throughout the week (weather permitting). To be sure no one is left out of these exhilarating activities, each child should bring an extra pair of clothing and a swimsuit daily to camp. Closed-toe shoes must be worn at all times during camp activities and on field trips. Camp starts at 7:30 a.m. and ends at 4:30 p.m. Children will not be accepted before 7:15 a.m. – no exceptions. At 4:30 p.m. children that are not picked up will be transitioned to Open Recreation. Families picking their child up after 6 p.m. will be charged a late fee of $1 per minute. No grace period allowed.

Weekly fees are based on total household income. The categories are determined based on DOD Childcare Fee Policies. Fees include snacks and field trip costs. Payment in advance for the first and last week of camp is required at time of enrollment. Weekly payments are due on the third day of the week. A late payment fee of $20 will be applied to payment after the third day of the week.

Category	Total Income	Weekly Rate
I	$0-29,400	$55
II	$29,401-35,700	$65
III	$35,701-46,200	$75
IV	$46,201-57,750	$91
V	$57,751-73,50	$106
VI	$73,501 -85,000	$122
VII	$85,001-100,000	$131
VIII	$100,001-125,000	$134
IX	$125,001 +	$137

The following documentation must be completed to enroll each of your children in the program: application form, AF Form 1181 – Youth Registration, AF Form 1055 – Medication Permission Slip (if applicable), copy of your leave and earnings statement or W2 (note: if information is not provided, the highest category (IX) will be used to calculate weekly rate).

To start your child on this extraordinary adventure, contact Youth Programs for applications. The first and last week's fees are due at time of enrollment to hold your child's slot. Two week's written notice of cancellation must be provided or fees will be forfeited. Fill out the Summer Camp Adventure Application and return it, along with the other required documentation and weekly fees, to Youth Programs no later than two weeks prior to start of camp. You may select as many weeks as you want on one application, but a different application is required for each child attending.

Weekly themes:

Week 3: June 13-17 Super Cool Penguins and Polar Bears
Week 4: June 20-24 African Savannah Safari Surprise
Week 5: June 27-July 1 Star Spangled Spirit Spectacular
Week 6: July 5-8 Slam Jammin' Sports Celebration (note: closed July 4)
Week 7: July 11-15 Hidden Jungle Journey
Week 8: July 18-22 Wonka, Wishes & a Golden Ticket
Week 9: July 25-29 Undersea Exploration Celebration
Week 10: August 1-5 Magical Myths & Ancient Adventures

For more information contact Youth Programs at 454-3277.

Arnold Youth Programs will host **Missoula Childrens Theatre's production of "The Jungle Book"** July 11-16. Auditions are open to children of AEDC families and the local surrounding communities that have finished first grade through age 18. Preregistration is required and will begin June 1. Cost is $20 per child ($5 discount for additional children in the same family). Deadline to register is July 7. Once each age group is filled to capacity (total of 60 cast members and four assistant directors) no additional children may sign up. By preregistering, this will eliminate the possibility of children being turned away at the audition. Registered children will participate in an audition at 4:30 p.m. July 11. The audition process will take approximately two hours, and some may be required to stay an additional two hours for rehearsal. Call 454-3277 to register. Payment is due at time of registration. The full production performance will be open to the public at 2 p.m. July 16 at the Manchester Performing Arts Center. Admission will be $10 for adults and $5 for children age 3-5.

Fitness Center
454-6440

The 26th Annual **Golden Baton Relay** will be held June 22 beginning at 8 a.m. The race is held in front of the A&E Building and each team runner must complete two laps around the A&E Circle before passing the baton to the next runner. Teams must consist of four runners with a combined total age of at least 120 and one timekeeper. Teams may select appropriate and tasteful ways to distinguish themselves and may bring their own baton or use batons provided by the Fitness Center. The first six teams to sign up will receive event T-shirts. Prizes will also be given for the most clever team name, best team costumes and overall team speed. Call to sign up or for more details.

Karate class is held 3-5 p.m. Tuesdays and Thursdays on the main gym floor. This class is taught by volunteer Don Gardner of ATA. For more information on these classes contact Don at 454-3497.

The Fitness Center staff welcomes any **individual request for assistance** in developing a specialized fitness plan to help complete your fitness and health objectives. Call for assessments, instruction and fitness/workout plans.

Outdoor Rec (ODR)
454-6084

Paintball is set for June 11. Ages 10 and older are invited to play. Meet at Outdoor Rec. at 9:30 a.m. Cost is $20 and includes lunch. Remember to wear long-sleeved shirts and long pants.

Swimming Lessons have been scheduled for June 20-24 and July 11-15. Cost is $15 per person and is for ages 6-months and older. The Parent-Tot Group (age 6-months to 4 years) will be held at 10 a.m. and ages 4 and up will meet at 11 a.m. Classes will be Monday through Friday for 50 minutes each at the ALC beach. Deadline to sign up is June 18 and July 9 respectively.

Corn Hole is available for rent for office functions and private events. Each set rents for $10 per day or $15 for two days. Four sets are available to accommodate larger groups. Rental reservations may be made through Outdoor Recreation (building 3055, previously known as Community Activities Center) or by calling 454-6084.

Wingo Inn
454-3051

Reservations for Wingo Inn can be made 120 days in advance. Room rates start at $39 per night. Please call 454-3051 for reservations.

The Services insert to the High Mach is designed to inform our customers of events and specials in Services activities. All program dates, times and prices are subject to change.

Services hours of operation:

Arnold Lakeside Center – Special function luncheons available. Call 454-3350 for arrangements. Catering/Management offices Tuesday–Friday 10 a.m.–3 p.m.; Lunch: limited menu Wednesdays, 11 a.m.–1 p.m., call 454-5555 to place orders; Dinner: Arnold Express Menu or Hap's Pizza only Thursday 5–8 p.m., dinner or Arnold Express Menus and Hap's Pizza Friday 4–9 p.m. and Saturday 5–9 p.m.; Main Bar Thursday 5-8 p.m., Friday 3:30–10 p.m. and Saturday 5–10 p.m.; Social Hour Friday 4–6 p.m., Movie Night Thursday 6 p.m.

Family Member/Youth Programs – Tuesday through Friday 10 a.m.–5 p.m., Saturday 12–5 p.m., First Friday Movie Night 5–7 p.m.

Outdoor Rec – Main Office, Check In, Marina and Auto Shop Tuesday through Sunday 8 a.m.–6 p.m.

Fitness Center – Monday-Friday 5 a.m.–9 p.m.; Saturday 8 a.m.–4 p.m.; Sunday 12–5 p.m.

Arnold Golf Course – Pro Shop & Driving Range 7 a.m.–dusk, Driving Range open 24 hours with prepurchased key card. Mulligan's Grill: 6:30 a.m.–2 p.m. Monday through Friday, 7 a.m.–2 p.m. Saturday and Sunday.

Recycling – Monday through Friday 7 a.m.–4 p.m.

Wingo Inn – Monday through Friday 7 a.m.–6 p.m., Saturday and Sunday 8 a.m.–4 p.m.

Barber Shop: by appointment – Monday, Wednesday & Friday 8 a.m.–2p.m.; Thursday 8 a.m.–noon.

BOYER *from page 9*

I'll repair it [and give it away]. I've given a lot of stuff to Goodwill.

"I've worked in a shop all my life. I'd hate to live without a shop. I can do just about anything in there."

In good health, except for a back problem that can make walking painful, Boyer looks back gratefully and contentedly at a life well-lived.

"I've had so many good things happen to me in my lifetime," he said. "I've accomplished what a person should accomplish in his life. [I have] very few regrets, and I'll tell you that's a good feeling."

DISPLAY *from page 9*

AEDC Fellow and Chief Technologist Dr. Ed Kraft, said, "It lays the physical approaches to understanding rocket plume signatures … basically instigated the whole plume signature measurements and modeling approaches we use today."

Fred Rascoe, the lead at AEDC's technical library, said, "We've been trying to find a way for the library to acknowledge the 60th is coming up and that we have a huge collection of the testing work that has been done here in the form of technical reports and technical memorandums.

"For the 60th we wanted to get inputs from AEDC Fellows, the ATA technical fellows and some engineers who've worked at AEDC over the years," he said. "I just put out a call and said, 'What technical works have been published at AEDC, or [are] important or have had some sort of lasting effect or been notable in some way?'"

Rascoe said he got responses from people like Dr. Kraft, Bill Lawrence, Mike Mills and Stan Powell.

The display measures 10-by-10 feet and uses graphics to provide highlights of representative technical reports and include the reasons why those documents were chosen for the 60th celebration.

Rascoe acknowledged he's learned a lot more about the history of AEDC in the process. He said the display at the library in the A&E Building serves as a testimonial on how significant AEDC has been to the country over the years.

"It's kind of a reminder of how AEDC is vital now," he said. "The technical work being done now is going to impact things decades down the road, just like the past 60 years have impacted the way things are being done now."

Rascoe pointed out that many of the technical reports authored by AEDC engineers are still used as references for current testing and research work at the center and elsewhere.

"AEDC Technical Report (TR) 73-5 is called 'Handbook, Uncertainty in Gas Turbine Measurements," he said. "That report is still referenced by current TRs that are published. It's a widely-used standard for uncertainty measurements in turbines.

"That's one example, but it's important to remind folks why AEDC is here and this is some of the work that's been done and that will continue in the future."

Rascoe pointed out that the display is only a sampling of technical reports authored by AEDC's engineers.

"This display will include some of the important ones," he said. "Besides the reports we will highlight in our display, there are a lot more in our collection for those unfamiliar with AEDC's history to discover. Many more reports are available for future displays and discussions."