Vol. 61 No. 1

# Approach

The Navy and Marine Corps Aviation and Maintenance Safety Magazine

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not today pg. 12

## 10 Questions for Maintenance Leaders pg. 30

**PLUS: Send Your Photos to be Featured in an Upcoming Issue**

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# *Approach*- MECH

## The Navy & Marine Corps Aviation and Maintenance Safety Magazine

2016 Volume 61, No. 1

**RDML Christopher J. Murray, Commander, Naval Safety Center**
**Col Glen Butler, USMC, Deputy Commander**
**Maggie Menzies, Department Head, Media and Public Affairs**
**Naval Safety Center** (757) 444-3520 (DSN 564)
**Dial the following extensions any time during the greeting**
**Publications Fax** (757) 444-6791
**Report a Mishap** (757) 444-2929 (DSN 564)

### Approach-MECH Staff

**Nika Glover, Editor-in-Chief** juanika.glover@navy.mil, Ext. 7257
**John Williams, Visual Information** john.w.williams1@navy.mil, Ext. 7254
**Allan Amen, Visual Information** allan.amen@navy.mil, Ext. 7248

### Aviation Safety Programs Directorate

**CAPT John Sipes, Director** john.sipes@navy.mil Ext. 7225
**Kimball Thompson, Deputy Director** edward.thompson@navy.mil Ext. 7226
**CDR William Murphy, Aircraft Operations Division Ext. 7203**
**CAPT Mike Penny, Aeromedical Division**
**CAPT Robert Frick, Aeromedical Division** Robert.frick@navy.mil Ext. 7228
**LT Alexa Sandifer,Explosives/Weapons Division** Ext. 7164

### All Analyst

safe-code11@navy.mil Ext. 7811

### Aircraft Maintenance and Material Division Head

**CDR Tom Gibbons,** thomas.l.gibbons@navy.mil Ext. 7265

### Avionics/ALSS Branch Head

**CW05 Daniel Kissel,** daniel.kissel@navy.mil Ext. 7285

### System Maintenance Asst. Branch Head

**MGySgt William Potts,** william.potts@navy.mil Ext 7276

### Code 12 All Call

safe.avnfdbk@navy.mil Ext. 7812

Mishaps cost time and resources. They take our Sailors, Marines and civilian employees away from their units and workplaces and put them in hospitals, wheelchairs and coffins. Mishaps ruin equipment and weapons. They diminish our readiness. This magazine's goal is to help make sure that personnel can devote their time and energy to the mission. We believe there is only one way to do any task: the way that follows the rules and takes precautions against hazards. Combat is hazardous; the time to learn to do a job right is before combat starts. *Approach* (ISSN 1094-0405) is published bimonthly by Commander, Naval Safety Center, 375 A Street Norfolk, VA 23511-4399, and is an authorized publication for members of the Department of Defense. Contents are not necessarily the official views of, or endorsed by, the U.S. Government, the Department of Defense, or the U.S. Navy. Photos and artwork are representative and do not necessarily show the people or equipment discussed. We reserve the right to edit all manuscripts. Reference to commercial products does not imply Navy endorsement. Unless otherwise stated, material in this magazine may be reprinted without permission; please credit the magazine and author. *Approach* is available for sale by the Superintendent of Documents, P.O. Box 979050, St Louis, MO 63197-9000, or online at: bookstore.gpo.gov. Telephone credit card orders can be made 8 a.m. to 4 p.m. Eastern time at (866) 512-1800.Periodicals postage paid at Norfolk, Va., and additional mailing offices.

Postmaster: Send address changes to *Approach*-MECH, Code 70C,
Naval Safety Center, 375 A Street
Norfolk, VA 23511-4399
Send article submissions, distribution requests, comments or questions to the address above or email to: SAFE-Approach@navy.mil and SAFE-Mech@navy.mil


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## Approach



**On the cover:**
AWS3 Brandon Seufert, left, worked with John Williams, a Visual Information Specialist at the Naval Safety Center to create the cover page. AWS3 Jamus Honson, right, also worked on the photo shoot, but was not featured on the cover. At the time, both Sailors flew with HSC-2.

## MECH



**On the cover:**
Aviation MM2 Alexandra King, performs routine maintenance on an MH-60R Sea Hawk helicopter of HSM-37 aboard the USS CHUNG-HOON (DDG 93) (Photo by Mass Communication Specialist 2nd Class Marcus L. Stanley)

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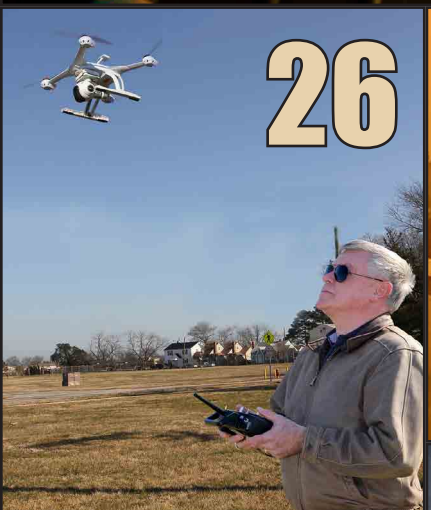






# Change is in the Air

It's already spring and the first issue of Approach-Mech is finally here. Those of us on the staff felt that the magazine should not only have great content but should also be visually interesting. So we took the time to ensure it met both goals.

These two magazines have a long history and they deserve a spectacular reemergence. With that said, one of our biggest challenges during the redesign was figuring out how to integrate Mech magazine without upsetting our audience. We considered flipping it on the back or adding a pullout in the middle. We even considered adding both titles to the cover. However we had to ensure it still met the periodical guidelines. So we decided the best way to integrate the two was to make Mech a department of Approach. We hope we achieved the goal of making the magazine a representation of both the maintainers and aviators.

While I was going through your submissions for this issue, I discovered that many of you like to include photos. Please keep those coming as we feel the story only gets better when an author is able to give us a visual representation of his or her experience. Check out the information below to see our submission guidelines for photos and articles.

We get a lot of submissions for Bravo Zulus and I will try my best to include every single one of those. You deserve the recognition that your leadership took the time to request from us. Don't forget to include photos with those. As you will see in this issue, the Bravo Zulus went above and beyond to ensure the safety of their fellow Sailors and Marines.

You may have also noticed that we have three articles from our very own members of the Naval Safety Center. Take note of what they have to say. These are the folks who are going out to the fleet to make safety assessments. They've seen it all, and are experts in their field. So they know what they're talking about.

Take a look at the diagram on page 19 regarding the risk of financial loss after a permanent disability due to an on the job injury. You will note that no matter what rank you are, your compensation will cap at a certain point and there will be no advancements from there if you get hurt. So be safe and continue to rise within the ranks.

If you have a job that requires you to do more than six hours of sitting, check out the poster on page 11. It's designed to be a cut out that you can reference whenever you need to get a little relief. Try some of the techniques mentioned and I guarantee your neck, shoulders and back will be grateful.

On a side note, I received an email from LT James Harrison, letting me know that the article, "Effects of Nicotine use in Aviation" (printed in the November-December 2015 issue) contained a misprint. It stated that an aviator is allowed to have "four to five cups of coffee or 150mg of caffeine". What it should have said was "aviators are authorized 450mg of caffeine", according to OPNAVINST 3710.7u Chapter 8, 8.3.2.5 (6). Thank you, LT Harrison, for catching that and keeping us honest. If you ever see an error in fact or a simple misprint, please don't hesitate to let us know.

Last, I'd like to thank ATCS (AW) Daniel Eborn for assisting the Approach staff in December of 2015 with helping to coordinate the front cover photo shoot. The two Sailors, AWS3 Brandon Seufert and AWS3 Jamus Honson were excited to participate and ATCS Eborn even brought along his camera just in case we needed extra photos. I hope you like the cover page and those that follow.

Nika Glover

Editor, Approach and Mech
Naval Safety Center


## PHOTOS WANTED

The Approach-Mech staff would like to print your photo submissions. If you have interesting safety related images to go along with a story, or a single image we would like to print it.

Please send an email to the editor at: Approach: SAFE-Approach@navy.mil or Mech: SAFE-Mech@navy.mil. All photos must be high resolution (300 dpi) in JPEG or JPG format. Photos submitted in a word document or PDF will lose it's quality. Be sure to include the photographers full name. If you have an image larger than 10MB, email the editor first for an alternate submission process.

If you'd like to submit an article with the image, it must be double spaced in Courier New 11 point font.

# THE WINGMAN FOUNDATION Leaves No Marine Behind

CAPTs. Phil "Donger" Duong, Jack "Chili" Guevara and Ken "Bronco" Hampshire, founders of The Wingman Foundation, had seen their share of tragedy. The three aviators had mourned for friends who died during missions or training mishaps over the years.

Two of them were assigned to Marine Light Attack Helicopter Squadron 469 when an AH-1W Cobra and a UH-1 Huey collided near Marine Corps Air Station Yuma, Ariz. Seven Marines, including six from HMLA-469, died in the accident.

"We saw that there were some gaps in the support the family received, and that's kind of what primed it," said Guevara, a Cobra pilot with HMLA-469 and The Wingman Foundation's director of operations.

The MARSOC Foundation, which assists critical skills operators and their families, or the Marine Reconnaissance Foundation, which serves those in recon, do a great job of taking care of their own, Guevara said. They wanted to create a similar organization for aviators and their families, he said.

Two years later, when Cpl Jordan Spears with Marine Medium Tiltrotor Squadron 163, died after bailing out of an MV-22B Osprey while deployed in the Persian Gulf with the 11th Marine Expeditionary Unit, the three friends made a decision. They would form a nonprofit dedicated to helping the families of fallen Marine aviators.

We were all deeply affected," said Duong, an Osprey pilot with Marine Medium Tiltrotor Squadron 363. "We just called each other from three different locations all over the world and we just put our foot down."

Tragedy struck Guevara's squadron again in May when a UH-1Y Venom helicopter crashed during a humanitarian mission in Nepal. Six Marines, including four with HMLA-469, were killed.

"When we started this thing, we didn't realize it was 469 that was going to need it again," Guevara said. "We had no way to foresee that, but seeing what we went through and the families went through [in 2012], it was important to have a support structure in place."

Since Marines were carrying out a humanitarian mission as opposed to combat operations, their families initially weren't given travel compensation to receive their loved ones' coffins when they returned to the U.S. The Wingman Foundation team raised the money to pay for espenses like travel costs.

"They distributed it as requests for aid arrived, helping pay for expenses such as travel costs," said CAPT Michael Luke Goessman, a Cobra pilot with HMLA-T303.

"After you hear about a mishap, everybody is reaching for something to do," he said. "You kind of get that helpless feeling. You really want to help the families, but you don't know what you can do without being too intrusive."

Just days later, an MV-22B Osprey crashed in Hawaii, killing two Marines and injuring several more. The Wingman Foundation again sprang into action, covering a Marine wife's flight from California to Hawaii after her husband was injured.

"The Marine Corps couldn't address it that quickly, so the command and the family contacted us," Duong said. "We had her (at his) bedside within 24 hours of notification."

In addition to raising funds for immediate needs like travel, the Marines also honor fallen aviators like Spears with memorial sites their families can visit. The foundation also provides scholarships for veterans or dependents pursuing a higher education.

They're currently working with the wife of Silver Star recipient Lt Col Christopher Raible, the commanding officer of Marine Attack Squadron 211 who was killed in the 2011 attack on Camp Bastion in Afghanistan, to award a scholarship in her husband's name.

The Wingman Foundation, has successfully raised about $40,000 and hopes to reach $100,000 in the next year.

*Editor's note: This article was originally published in the Marine Times. More information on the Wingman Foundation can be found on their website www.wingmanfoundation.org.*

Members of the Wingman Foundation who are also active duty pilots created the organization as a way to help Marine aviators and their families in response to recent aviation mishaps.(Photo courtesy of the Wingman Foundation)

BY CAPT ADAM SCHOLL, AH-1W

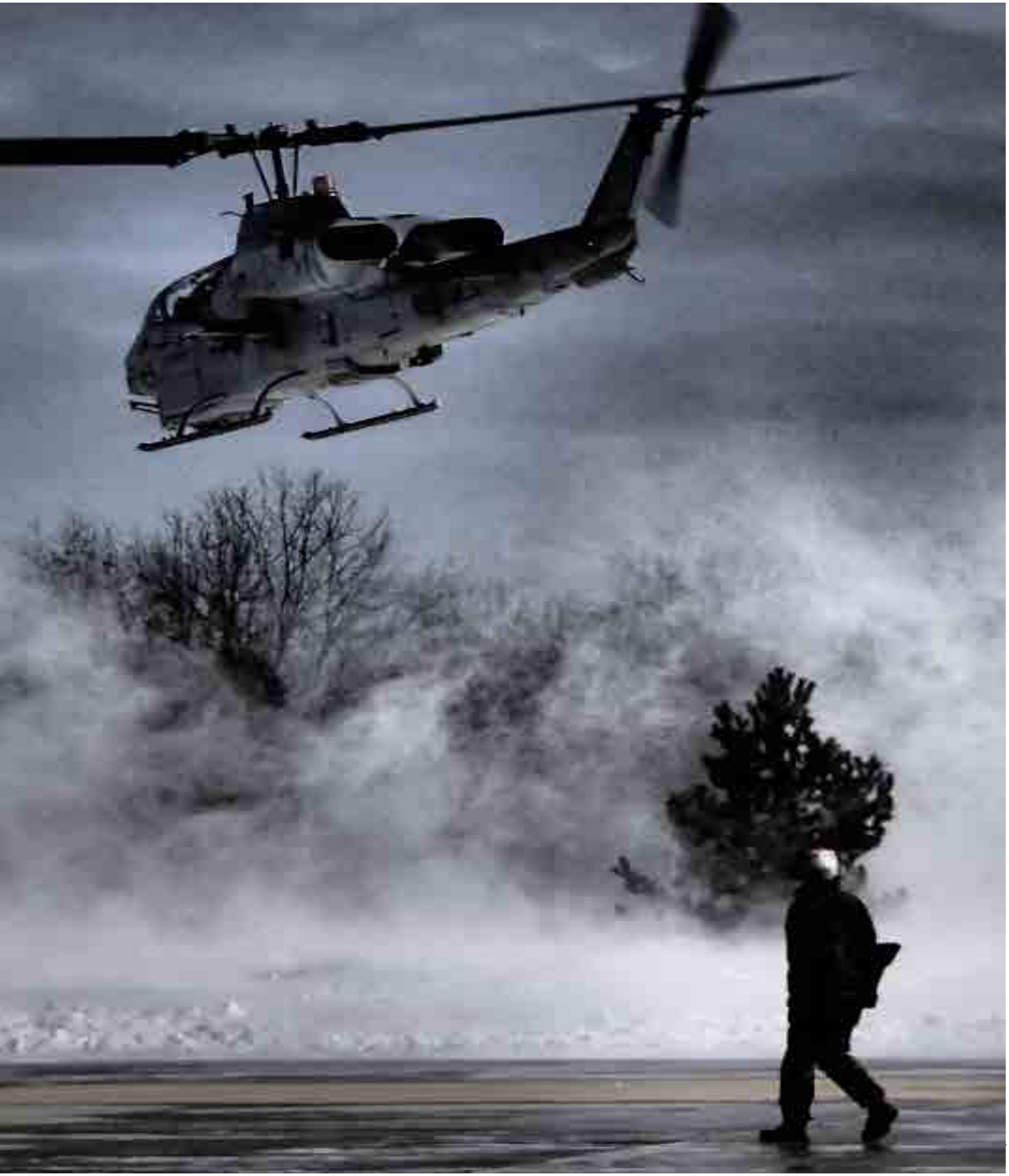
# Not Designed to Be Flown in the Clouds

When I arrived to the ready room on an overcast March day at Marine Corps Air Station (MCAS) New River, there was no reason to think that this night would be any different from most. As one of our squadron's senior night systems instructors (NSI), I was the section leader for a flight of two AH-1W Cobras. We are tasked with conducting a low light level (LLL) specific weapons delivery (SWD) training mission at BT-11, our primary aerial gunnery range located 50 miles to the northeast along the North Carolina coast. My co-pilot was the incoming squadron commanding officer, and the training and readiness manual dictated that he would fly this refresher event in the Cobra's rear seat. My wingman was the squadron's current commanding officer, who was also giving an LLL SWD training flight to a junior pilot.

At brief time, the operations duty officer (ODO) gave us our standard brief. We received the current and forecast weather, NOTAMs, and information regarding active ranges in the local area. The weather was forecast to degrade steadily throughout the night, but was expected to stay above VFR minimums of 1000-3. After the ODO finished, I briefed my section on the conduct of the flight, which would involve flying from MCAS New River to MCAS Cherry Point. There we would conduct forward arming and refueling point (FARP) operations in order to load ordnance and take on additional fuel before entering the range. After the section brief, I briefed my co-pilot on our inter-cockpit procedures. We then walked to the helicopters, conducted thorough pre-flight inspections, and launched as a section into the night.

Our SWD training on the range was uneventful, and took us approximately an hour to complete. After our training objectives were met, we egressed as a section back to Cherry Point to de-arm our aircraft, download our remaining ordnance, and take on more fuel. While on deck at Cherry Point, ATIS at New River called 800 foot ceilings and two miles of visibility. Although below VFR minimums, I opted to continue with the plan we had briefed and return to New River. We were all

A Sailor departs the flight line after an AH-1W Cobra takes off. (Photo courtesy CAPT Adam Scholl)



familiar with the area, and I was confident I could lead the section back using Special VFR (SVFR) procedures for the short 25-minute flight home.

Shortly after takeoff from Cherry Point, the weather degraded rapidly. New River ATIS now called ceilings at 500 feet and one mile visibility. This was still acceptable weather for a SVFR arrival, so we continued. The further we pushed, however, the worse the weather became, until we were flying at 200 feet AGL to avoid the clouds. Once we could no longer maintain 200 feet, I decided to split the section using our NATOPs inadvertent IMC procedures. I began my climb up to our briefed minimum safe altitude of 3000 feet MSL, flipped my goggles up to help transition to an instrument scan, and positively switched the section to approach control. Approach quickly established radar contact with both aircraft, assigned us separate transponder codes, and began giving us radar vectors for PAR approaches into New River.

En route to New River, we were vectored at 4500 feet MSL. I transferred the controls to my copilot, the incoming CO, because the AH-1W is better suited to be flown from the rear seat in instrument conditions. Before beginning his refresher syllabus, he had been away from the cockpit for two years while stationed in Washington D.C., so I felt that this was a perfect training opportunity. As expected, his procedures and airwork were solid. We were in thick clouds 90 percent of the time, only occasionally breaking out for a short periods of VFR-on-top conditions. Approach informed us that New River was now calling 200-foot ceilings and one fourth-mile of visibility. This is the absolute minimum weather an AH-1W crew can accept based on published approach procedures and the fact that the AH-1W is designated as a single-piloted platform for instrument purposes.

For those unfamiliar with the Cobra cockpit, the front seat is designed around the aircraft's weapons and targeting systems. The center portion of the dash consists of the targeting optics, the multi-function display (MFD) for the targeting sensor, and a joystick to control sensor movement. A hand controller similar to a video game controller is located on the left side of the MFD and is used to operate weapons systems, control the FLIR and optics, optimize images, and perform a number of other functions.

The flight controls are small joystick-like controls located on the left and right sides of the cockpit in order to minimize interference with the weapons and sensor controls. Additionally, the flying instruments in the front seat are located to the right and behind the sensor optics, requiring the front-seat pilot to tilt his head slightly in order to see them. In short, the aircraft is only designed to be flown from the front seat when absolutely necessary, and is not optimal for flight in IMC conditions. The rear seat is the primary seat for flying and for ballistic rocket delivery, and has a more conventional cockpit setup, with the cyclic between the pilot's legs and the instruments directly in front of the pilot.

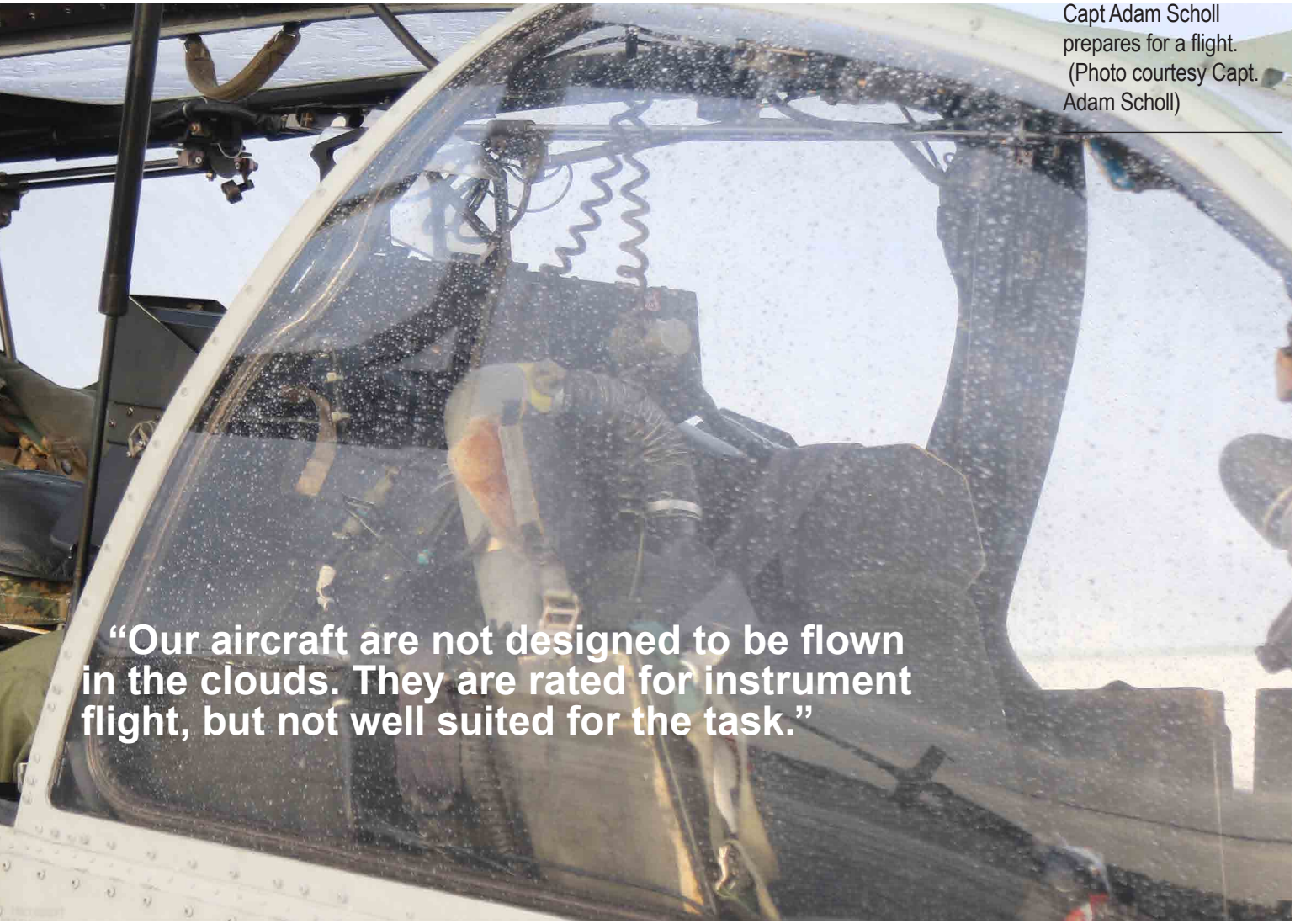
Due to my wingman's position, ATC vectored him for the first PAR to Runway 23. The order did not matter to me, because both aircraft had taken on a full fuel load at Cherry Point. Maintaining the inter-flight frequency in our back radios, we were able to update each other on conditions at the terminal phase of the approach. My wingman, the squadron CO, shot the first approach and informed us that he was unable to see the runway environment at the decision height and was executing a missed approach.


Knowing that my wingman was unable to break out of the clouds, it was my turn to give it a shot. With my co-pilot still at the controls in the rear seat, I backed him up on altitude and airspeed and transitioned between aided and unaided flight in an attempt to break out the runway lights. Approaching the decision height, I noticed we were rapidly decelerating and instructed my co-pilot to gain airspeed.

At the decision height, I saw our airspeed bleed all the way down to 20 knots. My co-pilot informed me that his instrument scan was breaking down task saturation, but that he knew we needed to regain airspeed and altitude. He immediately began to make the appropriate control inputs. I closely monitored the instruments as he pulled in max power and began a climb-out at low airspeed. Once back to relative safety at 1,000 feet, he began to increase airspeed.

At this point, approach informed us that they were switching both aircraft from Runway 23 to Runway 5 because the latter had the approach lights on. Unsure why they didn't give us this runway in the first place, we acknowledged the switch. It was my wingman's turn for another PAR.

Once again, he did not break out the landing environment, even with the runway lights on. Upon hearing him call a



Capt Adam Scholl prepares for a flight. (Photo courtesy Capt. Adam Scholl)

**"Our aircraft are not designed to be flown in the clouds. They are rated for instrument flight, but not well suited for the task."**

second missed approach, I decided not to try another approach to New River, opting instead to return to Cherry Point where the ATIS was calling 400-1. The plan was to execute a PAR there and shut down for the night, away from home field.

We were vectored back to Cherry Point, requested the PAR approaches, and were sequenced into the instrument pattern. My co-pilot was still at the controls in the rear seat. Though he was still doing a solid job, he informed me that the high workload of instrument flight in the Cobra was finally taking its toll. As we neared our decision height on the PAR, he stated he was beginning to experience vertigo and called for a control transfer to me in the front seat.

I took the controls and told him to let me know if he could break out the airfield. At the decision height, we finally saw the approach lights and were able to safety land. Taxiing back to the line to park the aircraft, we were both extremely relieved to be out of the clouds and safely on deck. I parked the aircraft and we shut it down for the night. Despite the collective experience of the four pilots in our section, there were many valuable lessons learned on this night. The first is that pilots should never pass up extra fuel when given the option, it is often hard to tell when it will be needed. This may seem obvious to many pilots, but it is not uncommon for East Coast H-1 aircrews to pass up extra fuel in order to save time. Often, when landing at Cherry Point to de-arm and download ordnance after shooting at the range, we only refuel if we don't already have enough fuel remaining to make it back to New River with our NATOPS minimum of 300 pounds. This saves time after long nights on the range. However, if we had chosen not to refuel on this night, the outcome might have been much different. Even more valuable, though, was re-learning the lesson of how important it is to maintain instrument flying proficiency.

Unfortunately, this is a skill that is not often emphasized in H-1 squadrons. Our training plans are so focused on weapons delivery and mission essential tasks that pilots often struggle just to achieve their yearly instrument minimums. Our lack of instrument time is also due to the well-founded fear of IMC flight in the H-1 community. Our aircraft are not designed to be flown in the clouds. They are rated for instrument flight, but not well suited for the task.

But this is a dangerous cycle. H-1 pilots must find the time to practice instrument flight in actual instrument conditions. This is the only way to build confidence and proficiency in a skill set that is critical to safe mission execution. You never know when it will be the only skill that will get you home safely on a dark and cloudy night.

BY LT ADAM COHEE, HSM-73

# Sand Blows

At 6 p.m. one evening I awoke to fly another night of Persian Gulf maritime intelligence, surveillance, and reconnaissance (MISR) coverage in support of the CARL VINSON (CVN-70) Strike Group.

My crew and I performed our operational risk management (ORM) NATOPS briefs and then headed down to the Combat Information Center to build our situational awareness about the operating area. This flight was a little different because our parent ship, USS GRIDLEY (DDG 101), was the escort for the carrier into port, but we all viewed it as just another MISR bag.

The brief from the tactical action officer and anti-submarine/anti-surface tactical air controller revealed no contacts of interest or critical contacts of interest in the area. The weather report showed the typical Persian Gulf haze with no ceiling and seven to nine miles of visibility.

The plan was to launch at 0330 and recover at 0630, a night time launch, and land after sunrise. It was nice to finally get some daylight flying since our typical coverage periods had all been at night. The first flight of the evening landed on time and we strapped in to take the aircraft for the second go. During our helicopter aircraft commander (HAC) to HAC turnover, I received the report: "Aircraft is flying great, no gripes. Not many contacts out there, and the weather is a bit hazy around the ship but it clears up down to the south." We launched on time and began our transit 40

Sailors perfom flight checks from the flight deck on USS CARL Vinson (CVN-70) during a sandstorm. (Photo courtesy LT Cohee)
*Editor's note: this image depicts the actual day of the sandstorm. It was not Photoshopped in any way.*

miles to the southeast where the carrier was headed towards port.

As we flew toward our operating area, we noticed the weather was not clearing as expected. We heard a MH-60S crew from HSC-15 on our helicopter common frequency debating whether or not to take off from the carrier. Ultimately they decided to take off, so the weather couldn't be as bad as we thought.

Around that same time, we received a call from our controller with an updated weather report from the carrier, which called for a sandstorm. Most people call it their "spidey sense" or "hair on the back of their neck". All I know is that I started to feel some sensation that made me uncomfortable. I called back to our controller in an attempt to get more information on the sandstorm: when was it forecasted to occur, where, altitudes, expected visibility … anything. We also began asking for frequent updates from GRIDLEY's bridge watch team on observed visibility around the ship since we were now 50 miles to the south.

The ship reported better than two miles visibility so we didn't get too worked up about it, but decided to head back north anyway to get a look for ourselves. The aircraft carrier has aerographer's mates to observe and forecast aviation weather around the carrier. The CD ships do not have that luxury and rely heavily on predictions pushed by the carrier. Once the weather begins to deteriorate, aircrews often have a better vantage point than the shipboard watch standers in terms of "real-time" conditions.

For the transit north, we decided to climb to 5,000 feet to get above the haze and minimize our time flying in the sand. I'd never flown in a sandstorm before, and really was not sure how the aircraft would respond.

The engines' inlet particle separators seemed to perform as advertised as we never noticed any rise in engine temperature due to airflow interruption or any other signs of performance degradation.

Once within 10 miles of the GRIDLEY and with the sun rising, we began to descend to see what the conditions

were really like in the vicinity of the landing pattern. The visibility grew a little worse as we descended, but we could still see the sky above us. Passing through 1,000 feet, the conditions turned into full brownout. My plan was to level off at 500 feet and evaluate but at that altitude all we could see was brown. We decided to continue to descend to 200 feet, which was our pattern altitude; however, we could still see nothing. So we continued down to 150 feet. Unfortunately at that altitude, we could only make out the tops of the whitecaps on the water below nothing else. It was surprisingly uncomfortable flying around that low with a complete lack of visual acuity.

Time for a quick rundown of my options: I could try to land on my ship with weather below minimums for a normal approach, set up for an emergency low visibility approach (EVLA) or even a smoke light approach (both considered last resorts with no divert available), or head back to the carrier approximately 50 miles south.

I elected to have the ship turn all their lights and try a normal approach, and if that didn't work I would still have enough fuel to make it to the carrier for a carrier controlled approach (CCA). On the approach, we reached 0.2 nautical miles astern of the ship at 100 feet and gained no sign of the flight deck. Any closer and I didn't feel confident I could safely wave off. As we headed back outbound, we decided we had time for one more approach before being forced to choose another option. We shot the second approach with the same results which solidified my decision to fly south to the carrier where I knew the weather was at least a little better.

They also have a precision approach option where I felt I had a better chance of breaking out and safely get a lot closer to the ship. I am sure I could not have landed safely on the GRIDLEY. I could have shot an automatic approach to 50 feet over the water and then slowly closed the ship until I acquired it visually. This scenario is sometimes discussed on HAC boards (something I had completed just two weeks prior). However, such a procedure would be reserved for an extreme emergency situation where there was no other option short of ditching the aircraft in the water. For this reason, such a procedure is not written in any publication.

I could have tried an ELVA or a smoke light approach, but both of these procedures take a while to set up and would have burned significantly more fuel. Furthermore, this would have taken away my option to get to the carrier, a much larger landing environment with experienced controllers and equipment designed for handling aircraft in degraded weather conditions. The choice seemed obvious.

As we headed south back toward the carrier, we had the help of a 30-knot tail wind while the USS GRIDLEY watch team and combat element officer in charge coordinated our deck hit. The carrier was not at flight quarters and was prepared to enter territorial waters to pull into port. However, by the time I reached communication range with the ship, they already knew I was en route and had a plan in place for our recovery.

The aircrew of BattleCat 706 on the flight deck of the USS CARL VINSON shortly after landing in a sandstorm. From left, Aircraft Commander, LT Adam Cohee; Middle- Sensor Operator, AWR2 Justin Kangisser; Right- Co-Pilot, LTJG Steven Borden. (Photo courtesy LT Adam Cohee)

As we continued our transit, we realized the sandstorm had rapidly engulfed the entire area. We checked in with approach controllers about 10 miles out, and immediately received vectors for the CCA. I elected to have the copilot fly the approach, while the aircrewman slewed the forward looking infrared (FLIR), in search of the carrier.

I was responsible for the outside scan to gain visual contact of the ship and landing environment once close enough. On the approach, one mile from the tactical air navigation (TACAN) system, the controller asked us to "confirm visual." Our response was, "negative".

The controller replied, "roger, continue." At a half mile our aircrewman started to get a silhouette of the ship on FLIR, but I still could not see the ship visually. At least this gave me a little "warm and fuzzy" feeling that the ship was actually where we thought and we were looking good on lineup with a chance to break out.

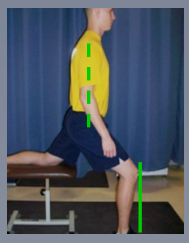
The controller once again asked us to "confirm visual"… " negative,"…"roger, continue." At approximately 50 yards from the back of the ship I started to make out the aft edge of the flight deck. Without taking my eyes off the deck, I took controls to slide the helicopter over the landing spot.

It turns out the swap of controls versus swap of scans procedure that was taught during instrument training in-flight school actually works. When I took controls, my co-pilot stated that he didn't gain visual of the ship until we were hovering alongside. After landing, we noticed that we were unable to see the bow of the ship from the spot.

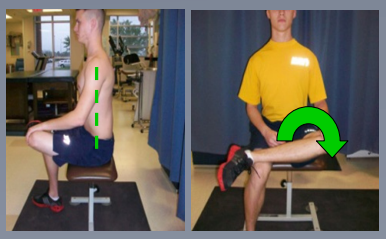
We knew there was no way we were re-launching in these conditions and Air Boss confirmed by saying, "Just so we are all on the same page, you are shutting down." Happy to be out of the sandstorm and done with the flight, we replied "roger, concur". Certainly this was not just another MISR bag.

# **MOVE IT:** Surviving the Stress of Sitting

The following movements are designed to help unload the neck and low back from the negative effects of sitting. By incorporating these activities into your daily routine, you will help reduce stress and strain on the muscles, tendons and skeletal system. While exercising, breathe normally and use smooth movements. If you feel any unusual pain or numbness, stop. If the symptoms persist, see your physician immediately.

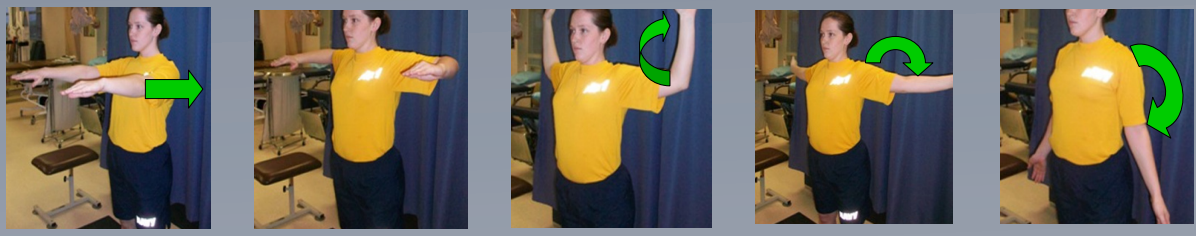


Hold for 20-30 seconds. 3 times each side.

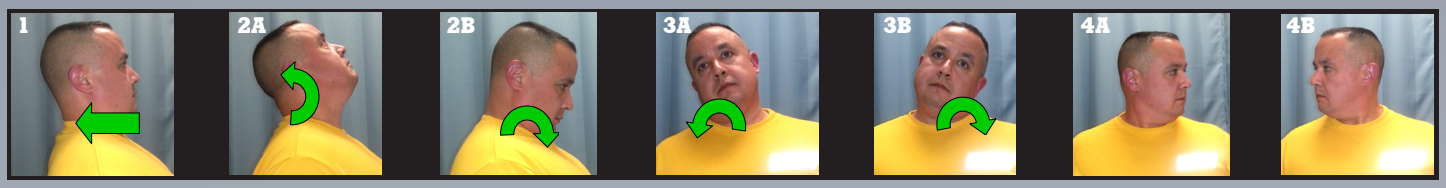


Hold for 20-30 seconds. 3 times each side.

Chest up, wide stance (minimum of shoulder width apart), feet flat, knees over the feet. Tighten Abs, push rear back. Squat, maintaining knees over the feet. Hands slide down/up the wall. Return to starting position. Repeat 4-6 times.



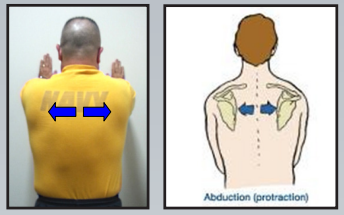
Start with arms/shoulders fully extended. Squeeze the shoulder blades together, keeping the arms straight. Bring the upper arms back and up. Rotate arms rearward until the forearms are up, palms facing forward. Keeping the shoulder blades squeezed together, gently extend the elbows, lowering the arms to the side. Repeat 3-5 times.



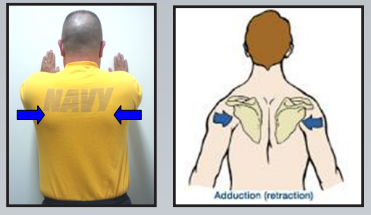

**1)** Lightly squeeze the shoulder blades and engage your core. Move your head/neck rearward as far as is comfortable. Hold for 2-3 seconds then relax. Repeat 3-5 times.
**2)** Retract the head/neck throughout the stretches. **A:** slowly tip your head back as if looking up at the ceiling. Hold for 2-3 seconds then slowly bring your head back to the starting position. **B:** slowly tip your chin down toward your chest. Hold 2-3 seconds then return to the starting point. Repeat 3-5 times.
**3) A:** Tip one ear toward your shoulder. Take this to full tension, holding for 2-3 seconds. Keep looking straight ahead to prevent rotation. Slowly bring your head back up to the starting position. **B:** Repeat to the opposite side. Repeat 3-5 times.
**4) A:** Rotate your head fully to one side. Hold 2-3 seconds, return to the starting point. **B:** Rotate to the opposite side. Repeat 3-5 times.

Hold full tension for 5-10 seconds, repeat with the opposite arm. Perform 3-5 times.

Lean back into a corner, feet shoulder width apart, elbows level with shoulders. Push out of the corner. Squeeze shoulder blades together. Relax back into the corner. Repeat 10 times.




Place hands on the wall with the arms extended, as if doing a push-up. Without bending elbows push into the wall, arching the upper part of your back. The shoulder blades will pull apart. Hold this tight for 2-3 seconds.




Then sink chest into the corner, squeezing your shoulder blades together. Hold tight for 2-3 seconds. Repeat 10 times.

**Caution:** Don't force any motion and go only as far as it is comfortable. Stop immediately if you feel any pain or tingling sensation.

This information is brought to you by the Naval Safety Center and the Naval Hospital Pensacola.

BY LT NICOLAS PARSONS, HSM-37

Three months into the USS MICHAEL MURPHY (DDG 112) maiden deployment, the embarked helicopter detachment from Helicopter Maritime Strike Squadron THREE SEVEN (HSM-37) experienced a potentially catastrophic RAST (recovery, assist, secure, and traverse) casualty. The HSM-37's Detachment FOUR "Warhogs," first MH-60R Detachment, had been conducting daily flight evolutions in support of Pacific Presence Operations in the South China Sea.

# Rogue?

## SORRY NOT TODAY

At approximately 1 p.m. on Jan. 13, 2015, after obtaining amber deck, the landing safety officer (LSO) and flight deck crew began traversing Easyrider 41 out of the hangar to prepare for flight operations. As Easyrider 41 approached the maintenance line, the aircraft suddenly changed direction and began rolling forward toward the port hangar.

The LSO was unable to affect any control through his console, which reflected normal indications. The traversing crew called for "brakes" as the 22,000 pound MH-60R quickly gained momentum, rolling down the sloped flight deck of the DDG FLT IIA. The brake-rider, an aviation electronics technician, was able to stop the aircraft with the tail wheel at the threshold of the hangar door. The flight deck director immediately called for chocks and chains and the aircraft was secured. After making sure no personnel had been injured by the rogue aircraft, the crew began to investigate the cause of the involuntary movement, which soon became clear. On RAST capable ships such as the USS MICHAEL MURPHY, the aircraft is secured to the deck through the use of a rapid securing device (RSD). This RSD is also used to traverse the aircraft into and out of the hangar. As Easyrider 41 approached the maintenance line, the aft cable used to move the RSD severed and the aircraft began to roll towards the hangar.

Although a potentially catastrophic situation had been avoided, the aircraft was still in a precarious position with the

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Sailors with HSM-37 Detatchment FOUR attempt to move a MH-60R after an RSD cable break on January 13, 2015 aboard the USS MICHAEL MURPHY (DDG 112) somewhere near the South China Sea. (Photos courtesy LT Nicholas Parsons)

tail pylon protruding out of the hangar. As the sea state began to increase it became clear that Easyrider 41 would need to be hand moved back into the hangar. To complicate the situation, the forward RSD cable had become fouled underneath the RSD system, and it would take approximately five hours for shipboard technicians to free the RSD and allow the aircraft to move.

Sailors move an MH-60R after an RSD cable break on (Photo courtesy LT Nicholas Parsons)

Following guidance in the Plane Captain Manual (A1-H60RA-GAI-010), which provides procedures for manual aircraft handling, and the Aircraft Operating Procedures for Air-Capable Ships NATOPS Manual (NAVAIR 00-80T-122), detachment leadership began to formulate a plan to move Easyrider 41 back into the hangar. This included a deliberate operational risk management analysis of the risks involved with such an evolution, especially while the ship was at sea. We needed to conduct a safety brief with all personnel involved in the move and contact the HSM-37 commanding officer for permission to conduct a one-time hand move. Once everyone was briefed on their roles and with safety precautions in place, a move crew consisting of two directors, two chock walkers, a brake rider and seven push/pullers were positioned in accordance with the PC manual and Easyrider 41 was traversed 20 feet back into the hangar without incident. This would be the first of three manual moves required before the RAST system was operational again.

The USS MICHAEL MURPHY was scheduled to pull into Singapore in two weeks for mid-voyage repairs and plans were made to have NAVAIR representatives available to assist with the RAST system maintenance while in port. NAVAIR representatives quickly identified the requirement to have Easyrider 41 clear of the RSD and the RAST track, as all RAST deck plates were to be removed in order to replace the forward and aft traverse cables, and the electronic cable responsible for control of the RSD. Detachment leadership conducted an in-depth ORM analysis of the situation and developed a plan to traverse the aircraft from the port hangar to the starboard side of the flight deck. The HSM community has little documented experience available concerning manual moves on a DDG FLT IIA, beyond a basic outline in the A1-H60RA-GAI-010 and the NAVAIR 00-80T-122. Of particular concern was the three degree forward slope of a FLT IIA flight deck, which was mitigated by defueling the aircraft and augmenting the move crew with shipboard personnel handpicked by the detachment officer in charge.

With permission from both squadron and ship Commanding Officers, ORM analysis complete and the risk mitigated, the move crew was briefed on the move and the safety precautions in place. The "strong man crew" and safety observers were positioned in accordance with the A1-H60RA-GAI-010 and the order was given to begin pulling the aircraft out of the hangar. Once the main mounts of the aircraft were clear of the hangar, the steering bar operator maneuvered the tail wheel to allow the aircraft to continue moving towards the starboard side of the flight deck. The move was completed without incident.

The final move was completed once repairs on the port RSD were complete. The aircraft was moved approximately 20 feet to a spot over the port RAST track where it was positioned in the port RSD. From there, the aircraft was manually straightened and moved back into the hangar by the RSD. Since all of the USS MICHAEL MURPHY RAST cables had been installed in October 2010, NAVAIR directed the replacement of the forward and aft traverse cables on the starboard RSD as well. The final move was completed with the same safety measures and in the same manner as the previous two moves, and without incident.

A catastrophic failure of the RAST system is not something you plan for while executing flight operations in the South China Sea. From the brake rider's initial quick reaction to the final manual move, this evolution presented many challenges: the best way to secure the aircraft after a RAST failure, moving the aircraft up the three degree sloped flight deck, getting the aircraft out of the RSD, and the best time and place to execute the evolution with minimal impact to readiness.

The Warhogs were able to overcome these challenges safely and get back in the fight through multiple in-depth and deliberate ORM analyses, a thorough knowledge of current publications and procedures, and sound leadership. Hopefully the lessons learned from this evolution will help future HSM detachments overcome similar challenges.

# Approach Bravo Zulu

**Sailors and Marines Preventing Mishaps**

## LT BRAD TOMAN, VQ-4

Following a normal takeoff out of Tinker, Air Force Base, Okla., LT Brad Toman heard a loud pop passing through FL200. After this pop, LT Toman immediately recognized the co-pilots sliding window had cracked, and called for the appropriate checklists while descending to a lower altitude to relieve pressure on the damaged pane. After the completion of the appropriate NATOPs procedures, LT Toman and the flight crew determined the crack was on the outer pane of glass, and elected against a heavy weight landing, since the lower altitude and depressurized aircraft would relieve the majority of pressures on the window. The crew then held for two hours until the aircraft was at landing weight, and then proceeded to an uneventful full-stop landing back at Tinker Air Force Base where window was replaced.

# Bravo Zulu Submission Guidlines

Include a smooth narrative of the event, names and ranks of the nominees, and endorsements from the command safety officer and CO.

Approach and Mech BZs must include endorsements from squadron CO and appropriate wing or MAG CO.

Send an action photo of the candidate(s) on the job or crew with the nominee(s) identified in the photo. Photos must be high-res (300 dpi), saved as a JPG. A phone number should also be included.

We cannot work the BZ until we have all these "pieces." Forgetting the chops delays processing the nomination and its publication.

BY MATTHEW KNOWLES,USN RETIRED


Cmdr. Mikael A. Rockstad, commanding officer of the Arleigh Burke-class guided-missile destroyer USS DEWEY (DDG 105), speaks to the First Class Petty Officer Association about the results of the command's climate survey. (Photo by Mass Communication Specialist 3rd Class James Vazquez)

I woke this morning to the radio reporting, "24 inches of snow with 30 degrees in the eastern part of the county." I didn't think much of that; it was 50 degrees at my house with light rain and drizzle. My base is in San Diego, Calif! Snow in San Diego!

You mean Shamu, surfers and that world-famous zoo! San Diego has a very diverse climate; from desert to mountains to coastal beaches the temperature extreme can be as much as a 30 to 40 degree differences across the county on any given day. Perception of climate versus reality can be very different. However, I am not talking about meteorological climate; I am talking about your bases operational and safety climate.

An aviation organization spends a lot of time and resources fostering a safe and effective operational climate. My point here is what is your base climate? Through positional authority the pilots at your base tend to set the climate, by following the prescribed policies, regulations, procedures and directives.

The aircraft commander is the pilot-in-command (PIC), and through that positional authority, has a greater visibility demonstrating the safety management system (SMS). No one single member can shoulder the role of the SMS manager, it is a collaborative effort.

I am asking each member at a base to reflect on the climate that you foster. For the purpose of this article I am asking the pilots to examine that very concept of "climate" What climate do you set? A position of authority, in this case the PIC, fosters a positive climate and sets the tone for all the members at the base.

I am not only discussing the operational or safety climate but also the overall prevailing attitudes, standards and environ-

# What's the Climate Like at Your Base?

mental conditions in the work place. In other words, climate is what you expect. Do you set a prevailing trend, or current of feeling toward an overall positive climate?

This must be accomplished both as an individual and as a group. Although it is intellectually convenient to talk about doing the right thing, walking the walk is a whole lot tougher. Taking care of our individual needs is a pretty significant driver in our daily existence.

Who among us does not desire to make their personal situation better? That very drive is what promotes or hinders the climate.

The concept of climate extends to morale (the esprit de corps) when discussing the morale of a group, it is an intangible term used to describe the capacity of people to maintain belief in an institution or a goal, or even in oneself and others.

In the military we call this unit cohesion.

If the prevailing climate fosters good morale, and a sense of belonging to the whole"then the whole will benefit. If the climate is only fostered by negative atmosphere blame and discourse then fundamentally the morale will suffer and the unit cohesion will suffer. There must be a balance of positive and negative influences to achieve a team climate.

Pilots and crews must embrace their role in fostering this positive climate, however, they are at best sustaining the effort while the underlying problem continues to fester in a poor climate. There can exist at all levels in an organization, cultural disconnects, which are often reflected between the administrators and the employees, and again between the pilots and the crews.

As a direct result the crew may be underutilized and frustrated by a lack of contribution, while senior people feel overworked and compelled to sometimes compromise their personal integrity to get the work done.

Clearly there are both external and internal problems in this scenario. Unfortunately the external problem often becomes the focus and then the justification for shortcomings with origins that are closer to home.

However, the human factors that define the performance of an organization, both good and bad are perishable. This then requires an individual to develop an "attitude profile" through a self-assessment inventory and a detailed understanding of the company policies, regulations, procedures and directives both in human factors and the SMS.

The assumption is that persons exposed to these behavioral techniques will develop a positive attitude toward safety. Learn ways to foster a positive climate, while recognizing and avoiding unnecessary risk.

It would seem wise to require all personnel that are in the business of flying to have an in depth understanding of the role that human factors play in the safety of the aircraft, maintenance, crew, and passengers. Fundamentally, one must recognize that at the end of the day a solid positive climate in the organization is the key to overcoming adversity and provides the highest probability of success.

Identify and analyze hazards and risks, which are inherent in our operations. A poor climate demonstrates deficiencies in judgment and decision-making, improper behavior, poor incident/accident prevention, and overall potentially unsafe acts.

BY LT JOHN BETZA, NAVAL SAFETY CENTER

# WHAT IS $AFETY REALLY WORTH?

Over my three years stationed at the Naval Safety Center, I've seen countless HAZREP and mishap reports involving Sailors and Marines suffering injuries during routine evolutions.

These injuries, ranging from simple cuts and scrapes to permanent disfigurements and trips to the emergency room, are often entirely preventable, through the use of safety practices. However, despite "briefing all personnel" on the lessons learned, these events continue to recur.

The benefits of safety practices are often presented as improved combat readiness through the protection of people and assets. However, considering the previously mentioned trend, perhaps a more personal approach is needed. One of the most important factors in a Sailor or Marine's career is his or her pay and benefits. A look at the benefits of safety through its effect on someone's actual benefits may be an effective way to reach Sailors and Marines at an individual level.

### Hypothetical Scenario

In this hypothetical scenario, AM3 Timmy is performing a corrosion treatment on an aircraft. It's something he's done thousands of time before. All those thousands of times before, he's worn his PPE and encountered no issues. On the thousandth and first time, however, he stops to take a break and forgets to wear his PPE upon returning to the job. Despite his expertise, AM3 Timmy somehow gets a

corrosive agent in his eyes. His shipmates rush him to the eyewash station and the emergency room, but the damage is already done  AM3 Timmy is now legally blind which subsequently results in a medical discharge from military service.

### What If?

After a mishap, it's common to wonder "What if?" In this case, "What if AM3 Timmy had worn his PPE that day?"  The following is a rough attempt to examine this question through a financial lens, assuming AM3 Timmy was on a typical career track.

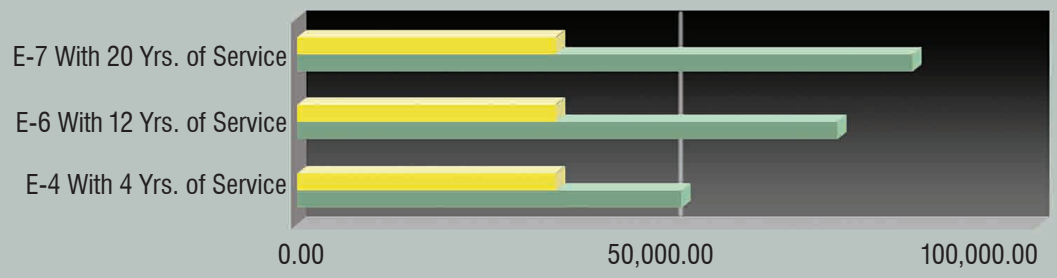
The financial benefits of safety are pretty clear – a net difference of approximately $600,000 over a 20 year span.  Keep in mind that this rough math only accounts for AM3 Timmy's pay during the period of active service. A financial expert could add in dependents, medical, military retirement benefits, and follow-on employment potential to make an even more convincing argument in favor of following safety practices.

### The Bottom Line

Safety plays an important role in preserving lives and assets.  However, an additional factor that needs to be stressed is safety's impact on the future well-being of our Sailors and Marines. From this brief analysis, it's clear that even a single lapse in proper procedure can have a drastic impact on someone's future "bottom line."  For your next safety stand-down, I encourage all leaders to show your Sailors and Marines just how much safety is actually worth.

*Editor's Note: AECS Brian Grimes, Naval Safety Center Aircraft Maintenance division, contributed to this article.*

## Regular Military Compensation *vs.* Disability Over a 20-Year Career




| | E-4 With 4 Yrs. of Service | E-6 With 12 Yrs. of Service | E-7 With 20 Yrs. of Service |
|---|---|---|---|
| VA 100% Disability | 34,881.96 | 34,881.96 | 34,881.96 |
| RMC | 51,850.86 | 72,969.40 | 83,372.22 |

The infographic above shows how a service members income stops at $34,881. 96 if he is injured in a mishap. All potential earnings would cap off at the rate of an E-4 not allowing the service member to reach their full earning potential. As illustrated in this graphic, being careless or unsafe could become a very costly mistake. (Infographic by Allan Amen)

BY LTJG STEPHEN BAUCHMAN, HSM-49

On a beautiful day in sunny San Diego our crew planned to launch on a CASEX event to track a friendly submarine. We were to work with a MH-60R squadron to localize and track our fictitious foe.

As one of the oldest rotary wing platforms still in the fleet, the venerable SH-60B Seahawk still had numerous anti-submarine warfare capabilities - one of those being technology first developed during WWI, the Magnetic Anomaly Detector (MAD). Essentially this system, when fully deployed, trails behind and below our aircraft by approximately 200 feet.

It assists in tracking submarines by detecting any abnormal magnetic anomalies in relation to the Earth's magnetic field (it detects giant metal objects in the water if we fly over them).

Our event was progressing as normal starting the aircraft, departing from home field, Naval Air Station North Island (NASNI), transiting and gaining communications with controlling agencies. As soon as we arrived on station and checked in, we conducted our combat checklist to include streaming the MAD. After the MAD reeling machine finished running through its cycle, we noticed a flickering MAD LIMIT advisory light on our caution/advisory panel indicating that the MAD had stopped at an intermediate position. At no time during this cycle did we get any indications in the cockpit that the reeling machine was not operating and streaming normally. As we waited for the 15 minute time limit between MAD reeling machine cycles, as required per NATOPS, we re-checked our checklists to ensure we had not botched this operation. During this sanity check we continued to prosecute the ASW problem at hand, notified the other aircraft involved, and the range controller of our disabled state.

Unfortunately, due to other system degradations aside from the MAD, we quickly became limited to only delivering buoys in this problem. We decided to deconflict and pull ourselves out of the ASW problem while we continued to troubleshoot. We executed the MAD REEL MACHINE FAILURE WITH TOWED BODY emergency procedure. After taking the appropriate actions with no success, we tried to see if we could reel

the MAD back in one last time before we returned to base. As we reeled the MAD in, one of our aircrewmen monitored from the cabin door to see if he could tell whether or not there was any movement. When our troubleshooting proved to be unsuccessful with the MAD still deployed approximately 40 feet, we began our coordination with the range controller to return to base. Using plain language, we explained what was going on with our aircraft (that we did not have a 'dipper') and to get into contact with our squadron duty officer to relay the status of the aircraft.Although we never officially declared an emergency, we were fortunate to be given priority handling. Each controlling agency was extremely helpful in providing us with whatever as required. FACSFAC was already aware of our situation before we checked in due to our previous coordination with the range.

Upon contacting NASNI Tower, we found them ready for our recovery. Tower assigned us the 'lost communications' pad at the approach end of Runway 36 where our Safety Team and Maintenance Personnel were awaiting for our arrival. NASNI personnel were very helpful in coordinating with our squadron to sit in a high hover over the beach line away from other runway and pad traffic until we were conned in to recover. We gained radio communications with our squadron personnel on

# The Last of the Hung Mads

A U.S. Navy maintenance crew recovers the hung mad at Naval Air Station North Island. Photo courtesy LCDR Walter.

deck and waited for them to signal us that they were ready. During the transit, we discussed how we would recover and what possible scenarios and conditions awaited us.

As we waited in a high hover, we went over our plan once more. The HAC was going to take the approach in the right seat (the side the MAD and our door was on) while I backed him up on instruments and aircraft parameters. Meanwhile one of our aircrewmen would be monitoring outside of the aircraft, similar to a VERTREP mission, and keep an eye on the MAD as our LSE signaled us. Once the ground team was ready and Tower cleared us to land, we slowly descended over the appropriate spot. Ground personnel did a great job in hooking the MAD cable and maintaining positive control of the MAD as we sidestepped and continued down into a low hover, eventually landed with the MAD towed array body just outside of our aircraft. We shut down on deck and maintenance personnel safely removed the MAD bird and cable.

During the post flight maintenance inspection, we determined that our hung MAD was caused by a pinched cable at the reeling machine. When the MAD was streaming out, the wires in the cable could not read how far the MAD was away from the aircraft. Unfortunately, this wasn't anything that could have been fixed in flight. Our emergency was rather benign, yet it had the potential to manifest into something more serious. Crew Resource Management was hands down the driving factor behind our success in keeping the emergency benign.

We used the resources available to us, both external and internal to our aircraft. It was unusual to have two aircrewmen on this type of flight, but it was advantageous to have one monitoring the external towed body of the MAD and communicate what he was seeing to the crewman and pilots in the aircraft. We were able to flex easily to the plan tower created with our squadron personnel for recovery.

One of the most helpful things was to have a pilot coordinating with maintenance personnel on the ground as well as with us in the aircraft. As pilots, especially helicopter second pilots and prospective aircraft commanders, we are constantly practicing scenarios in mock-HAC boards and it was a real opportunity to actually fly through an emergency with a crew instead of just drawing it up on a whiteboard or talk through it in a simulator. It is also rare that plane captains ever get to experience this kind of aircraft emergency. Overall solid CRM and real time risk management kept the last hung MAD in the history of the SH-60B Seahawk from becoming anything more than a delayed hotseat.

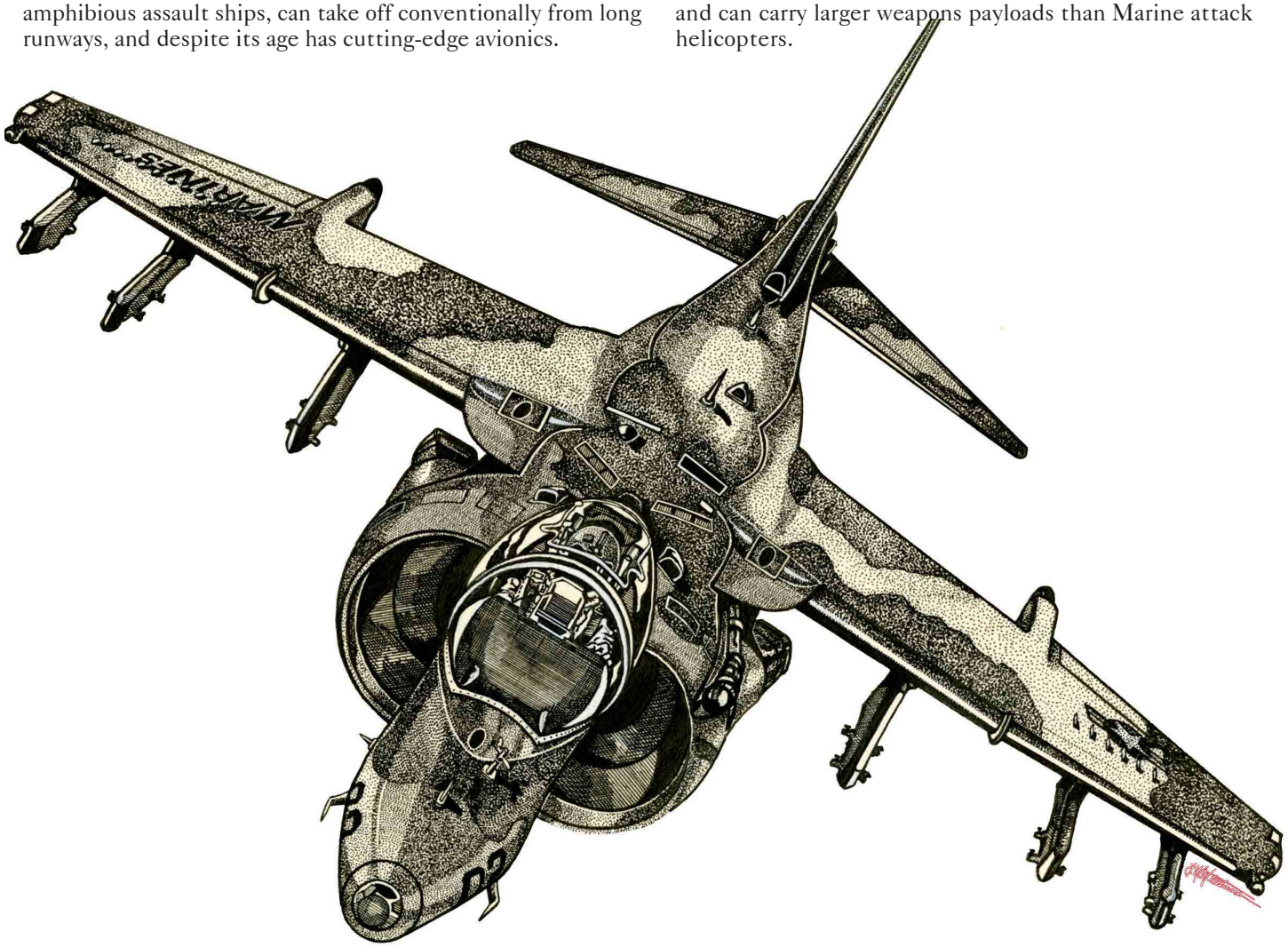
# AV-8B

The U.S. Marine Corps AV-8B Harrier II jump jet is one of the most upgraded military combat aircraft 30 years after its first deployments, and even longer than that since its initial design back in the 1970s.

The vertical and short takeoff and landing (VSTOL) aircraft after three decades of service still remains a unique military plane. It can take off straight up like a helicopter, can operate from unimproved short takeoff strips, can take of from amphibious assault ships, can take off conventionally from long runways, and despite its age has cutting-edge avionics.

It's not a sleek-looking aircraft; and can't fly at supersonic speeds; it's a mud fighter, and the plane looks it. The AV-8B appears stubby and awkward, and if you've ever been close-by when the thing takes off vertically, you know it's really LOUD.

Still, the plane has been the go-to aircraft for six Marine Corps attack squadrons and one training squadron that provides advanced instruction in the Harrier II. It can provide close air support to Marine infantry on the ground quickly, and can carry larger weapons payloads than Marine attack helicopters.



## Meet the Artist

John Williams has been an illustrator and graphic artist with the Naval Safety Center for 29 years. His art has earned numerous awards and accolades. Most recently, he received second place in the 2016 Russell Egnor Navy Media Awards for Graphic Design-Digital Art. He continues to create digital art and graphics for the Naval Safety Center and for the military. John's love for art and his deep respect for those who serve has extended his artwork to all branches of the military and many military defense platforms. John has been commissioned for special projects, such as military retirements, promotions, changes of command and other occasions.

BY CDR MARTY OHME, NAVAL SAFETY CENTER

# Man is Not as Good as a Black Box . . .

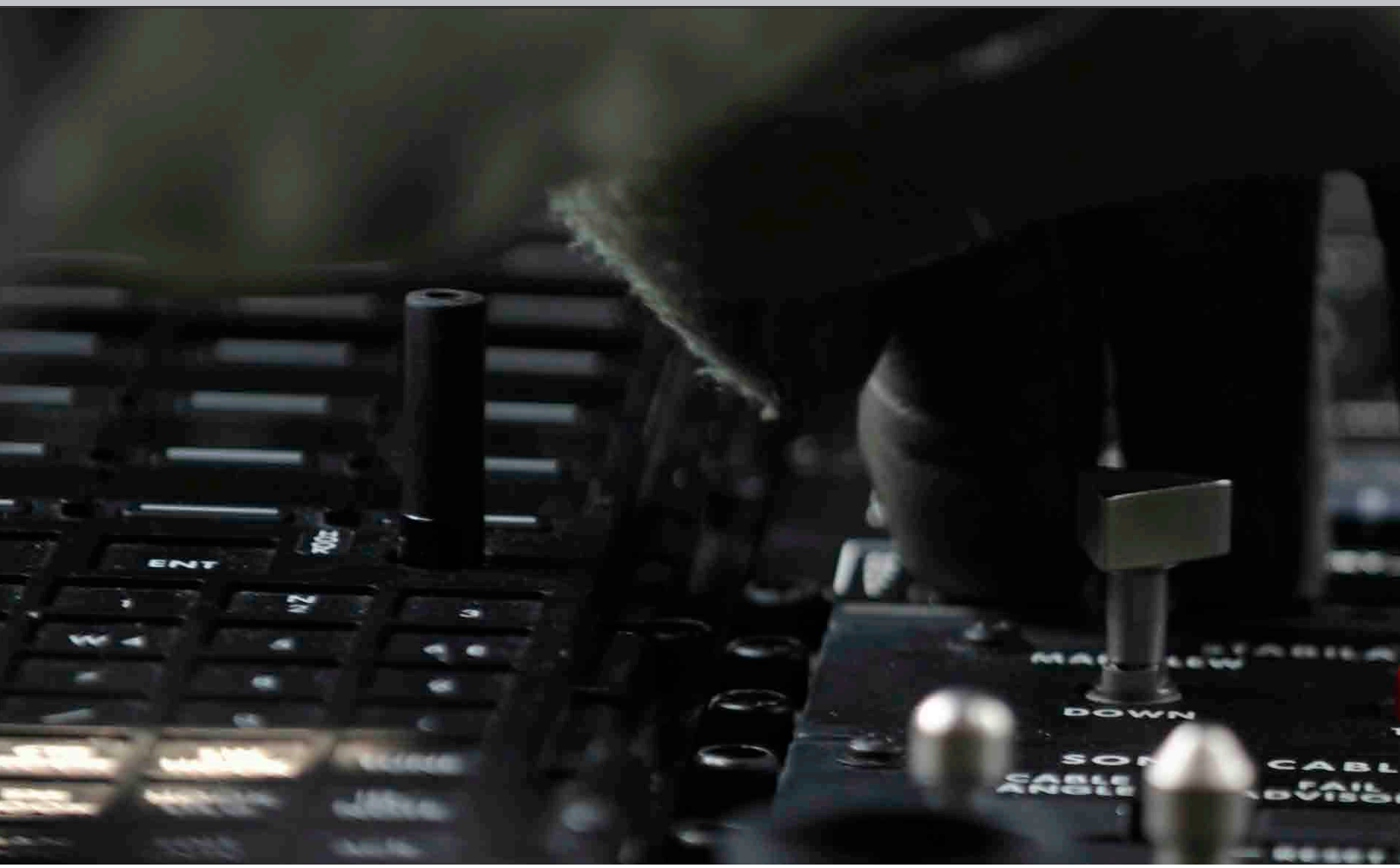
Many of you would call me a dinosaur. To borrow a phrase from a Tomcat guy I once knew, I'm a Phrog guy who flew the MH-60S. The change in cockpit technology from the H-46D to the MH-60 truly represents more than 40 years of evolution in aviation. While some of the change is a leap in capability, much follows the philosophy so eloquently expressed by Wing Commander H.P. Ruffell Smith less than a decade before the Sea Knight first flew as the Vertol 107. The same can be said for Tomcats or Intruders to Hornets and from the SH-60B to the MH-60R. Although automation was introduced in an effort to lessen negative human factors issues and thereby eliminate human error, it also presented another type of human error by changing the way information is processed by the pilot. This new type of error can get you killed.

One of those groups with really big brains proposed four information processing stages: stage one, acquisition; stage two, analysis; stage three, decision making; and stage four, action. Automation can carry out all four of these alone or can influence one or more based on system design. Acquisition speaks to how the information is presented to the aircrew, i.e. the interface. Is the data raw or formatted or processed in some way? Analysis is heavily dependent on presentation as the interface between machine and user effects data prominence and processing time. Decisions can be recommended to the pilot or not. Action can be designed into the system or left entirely to the pilot.

For example, the H-46 automatic flight control system (AFCS), which was called stability augmentation system (SAS) prior to an upgrade in the late 1980s, had a feedback loop to determine whether or not the pilot caused a change in aircraft attitude before corrections were made. The system had its issues, but altitude and power could reliably be trimmed shortly after departing a hover to achieve a given airspeed and altitude combination without further input. In contrast, the MH-60R/S AFCS holds altitude up to 40 knots, airspeed above 40 knots, uses the stabilator to keep the airframe as close to level as possible at all times, and programs the cyclic stick aft in proportion to airspeed. This provides a very nice instrument flight rules (IFR) platform, but trimming for a 70 knot altitude just after departing a hover would be followed by an automatic mode change from altitude to airspeed hold at 40 knots with a corresponding pitch up. The difference alludes to Wing Commander Smith's sentiment whereby the newer black box is better for the specific action of keeping a helicopter stable, yet man is better at analyzing and deciding what airspeed and altitude to fly and when.

NASA published a technical memo in the mid-90s where the author described a number of aviation automation concepts. The paper begins with a premise we all know well: the pilot bears responsibility for the safety of flight. It then follows

**"Man is not as good as a black box for certain specific things; however he is more flexible and reliable. He is easily maintained and is easily manufactured by relatively unskilled labor."**
**—Wing Commander H.P. Ruffell Smith, RAF, 1949**




a pilot must remain in command of their flight. No machine can relieve the on board human of this responsibility and the pilot cannot allow a machine to operate in an unintended manner without risking safety of flight. NASA goes on to offer a number of corollaries we can relate to.

The pilot must be actively involved. It is commonly known in the human factors field humans are not good monitors. If the task is simply to watch for an error or watch what is going on, detection rate will decline with time. A study using an automated traffic avoidance system revealed that an operator may lose situational awareness when control is left to either another human or to automation.

The same researchers also found that full automation yields a greater loss of situational awareness than using automation as an aide. Remember the Northwest Airlines flight that cruised past Minneapolis? Personal computers also played a part, but the pilots went 91 minutes without talking to ATC. How much monitoring do you think they did during that time?

Human operators must be adequately informed. Poor display design can inhibit the acquisition and analysis of data, which then impacts the amount of time and effort the pilot must use before making a decision, if he acquires the information at all. A HAZREP noted a new electronic horizontal situation indicator (EHSI) in the C-130 blocks the pilot and copilot view of the flight system annunciator lights. Every turn and altitude change requires the flight engineer to lean over to see and report the system status. Even if the display is well designed, the absence of information may be a problem. Examples from the civilian world include a flight management system (FMS) that dropped all intermediate fixes from the display when direct routing was executed and electronic horizontal situation indicators or approach plates where terrain was not depicted. It is reasonable for aircrew to expect the same features found in paper publications to be in electronic versions.

Operators must be able to monitor the automation assisting them. Part of the logic behind introducing automation in aviation was to eliminate errors however; both humans and machines make errors. In order to overcome the poor quality of human monitoring, a well-designed display must conspicuously display the situation as it is and will be. Evidence is mounting that current methods used to notify flight crews of mode changes are not adequate.

During my time flying the Sierra, it was not uncommon for the radios to switch to receive only for no apparent reason. This once happened to me shooting an approach to an international airport and the only indication was a tiny “R” in the bottom corner of the display.

In another example, American Airlines Flight 965 was offered an approach and runway change into Cali, Colombia. One hundred sixty-seven lives were lost when the new heading calculation made by the FMS flew the plane into a mountain without the pilots being aware of the amount of turn being executed.

The automated systems must therefore be predictable.


A pilot prepares for take-off in a multi-mission MH-60R Sea Hawk helicopter at Naval Air Station Jacksonville, Fla. The new Sea Hawk variant has many improvements, such as the glass cockpit, improved mission systems, new sensors and advanced avionics and the console. Photo by Mass Communication Specialist 2nd Class Shannon Renfroe.

Pilots tend not to have a good understanding of how computer systems in their aircraft function and, it follows, often expect equipment to operate in the same way the pilot would. This can lead to confusion as a system carries out programmed instructions and shifts from one mode to another. The pilot is then left to figure out what the machine is doing and often allows greater than normal deviations before intervening if the automation does not operate according to pilot expectations. A survey included the question, "Have you ever experienced situations in which automated equipment acted against your intentions?" Sixty-seven percent of respondents answered "Yes." The Air Inter Flight 148 accident report indicated the pilot entered what he believed to be a correct parameter using the correct dial. The pilot entered "3.3" for degrees glideslope when, in fact, the flight management system was in "vertical speed" mode. The system dutifully executed a 3,300 foot per minute decent. Once the pilots recognized the rapid rate of descent, they had just enough time to express their surprise before impact.

When systems do not function according to expectation, aircrews are more likely to try to figure out why and 'fix' the FMS than they are to take manual control until in a safer flight condition. Naval aviation examples include a Hornet lost behind the boat because the pilot waited too long to disengage the ATC to fly manually and a Romeo crew who failed to correct a failed cable angle hold problem before ripping staves off the transducer in the water.

Each intelligent element of the system must know the intent of the other intelligent system elements. Before discussing this corollary, one must accept the notion of aircraft automation as intelligent. The pilot must be able to enter accurate data into the aircraft system and then understand how and when each step is being executed. The same survey mentioned above indicates 88 percent of pilots felt that aircraft designers' logic is different from pilot-user's logic. A general example given is the abrupt nature of how one FMS performs a level off maneuver, which makes altitude deviations difficult to predict and prevent. While I'm sure some will argue differently, I offer the MH-60R/S AFCS mode change at 40 knots as an example. If the system interface is not adequate and the designers do not understand how the pilot will use the system, problems like these will result.

Despite the research done since the first automated systems made their way into aircraft about the time the Vertol 107 first flew, human factors issues continue to present themselves. Things are improving, but until it becomes common for engineers to consider items like native language, social factors, the 'four Ps' (philosophies, policies, procedures, and practices) when designing systems for pilot use in aircraft and two, pilots understand that automation only increases training requirements, human error will remain a regular part of aircraft operation and contributor to mishaps.

*Editor's Note: This article was adapted from an original academic work by the author. If you'd like a copy of the original academic paper, please contact the author at rudolph.ohme@navy.mil.*

# FAA Sets New UAS Rules

The U.S. Department of Transportation's Federal Aviation Administration (FAA) recently announced a streamlined and user-friendly web-based aircraft registration process for owners of small unmanned aircraft (UAS) weighing more than 0.55 pounds (250 grams) and less than 55 pounds (approx. 25 kilograms) including payloads such as on-board cameras.

The Registration Task Force delivered recommendations to FAA Administrator Michael Huerta and Transportation Secretary Anthony Foxx on November 21. The rule incorporates many of the task force recommendations.

"Make no mistake: unmanned aircraft enthusiast are aviators, and with that title comes a great deal of responsibility," said U.S. Transportation Secretary Anthony Foxx. "Registration gives us an opportunity to work with these users to operate their unmanned aircraft safely. I'm excited to welcome these new aviators into the culture of safety and responsibility that defines American innovation."

Registration is a statutory requirement that applies to all aircraft. Under this rule, any owner of a small UAS who has previously operated an unmanned aircraft exclusively as a model aircraft prior to December 21, 2015, must register no later than February 19, 2016. Owners of any other UAS purchased for use as a model aircraft after December 21, 2015 must register before the first flight outdoors.

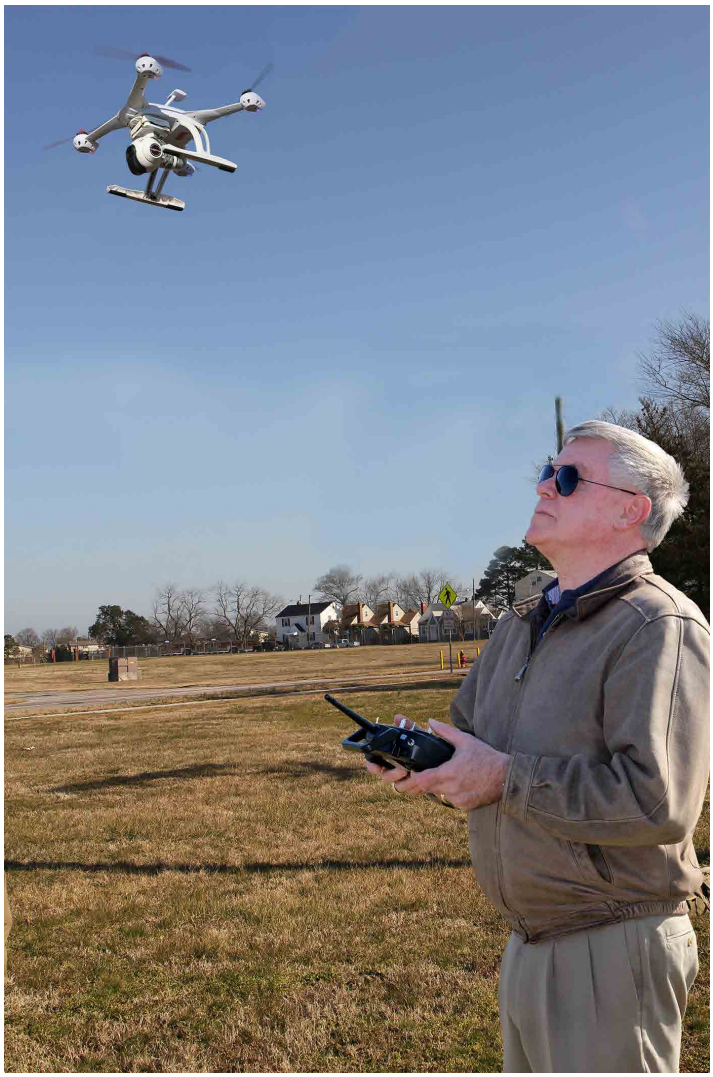
Owners may use either the paper-based process or the new streamlined, web-based system. Owners using the new streamlined web-based system must be at least 13 years old to register. Owners may register through a web-based system at www.faa.gov/uas/registration.

Registrants will need to provide their name, home address and e-mail address. Upon completion of the registration process, the web application will generate a Certificate of Aircraft Registration/Proof of Ownership that will include a unique identification number for the UAS owner, which must be marked on the aircraft.

"Registration gives us the opportunity to educate these new airspace users before they fly so they know the airspace rules and understand they are accountable to the public for flying responsibly," said FAA Administrator Huerta.

The online registration system does not yet support registration of small UAS used for any purpose other than hobby or recreation – for example, using an unmanned aircraft in connection with a business. The FAA is developing enhancements that will allow such online registrations by spring of 2016.

The full rule can be viewed here: https://www.federalregister.gov/articles/2015/12/16/2015-31750/registration-and-marking-requirements-for-small-unmanned-aircraft.



↑ Kimball Thompson, the Deputy Director, Aviation Safety Programs, at the Naval Safety Center operates a Blade 350 QX3, small unmanned aircraft. (Photo illustrations by John Williams)

↓ Although small unmanned aircraft are seen as toys, they could pose potential threats to military and commercial flight operations. For this reason, the Federal Aviation Administration has established new rules to keep the aircraft out of official airspace.

Hobby / Recreational Flying

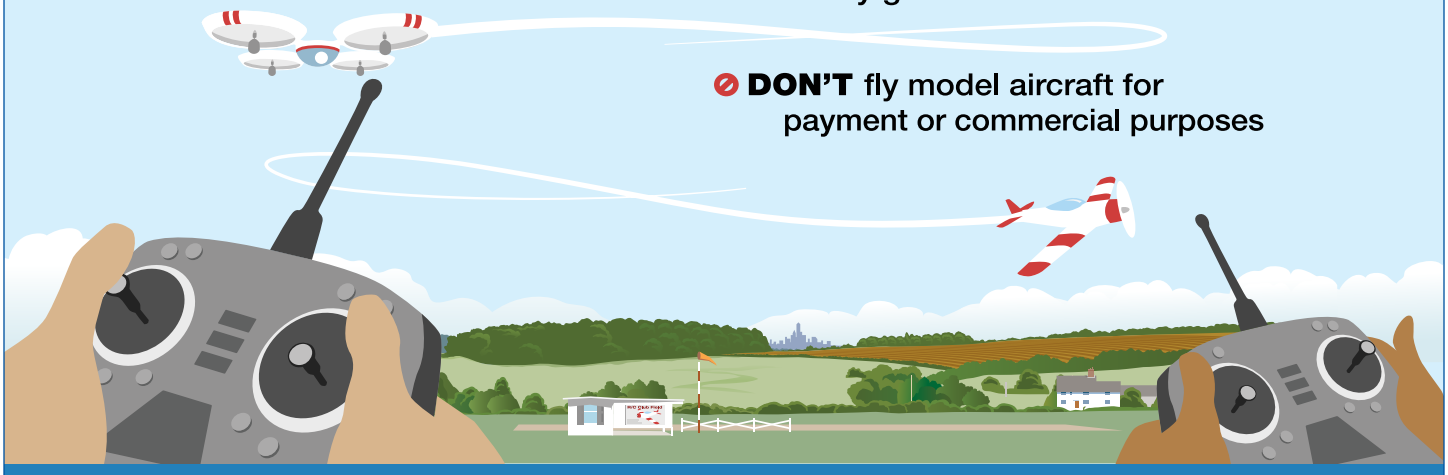
# What Can I Do With My Model Aircraft?

Having fun means flying safely! Hobby or recreational flying doesn't require FAA approval but you must follow safety guidelines. Any other use requires FAA authorization.

**AVOID DOING ANYTHING HAZARDOUS TO OTHER AIRPLANES OR PEOPLE AND PROPERTY ON THE GROUND**

- ✔ **DO** fly a model aircraft/UAS at the local model aircraft club
- ✔ **DO** take lessons and learn to fly safely
- ✔ **DO** contact the airport or control tower when flying within 5 miles of the airport
- ✔ **DO** fly a model aircraft for personal enjoyment

- ⊘ **DON'T** fly near manned aircraft
- ⊘ **DON'T** fly beyond line of sight of the operator
- ⊘ **DON'T** fly an aircraft weighing more than 55 lbs unless it's certified by an aeromodelling community-based organization
- ⊘ **DON'T** fly contrary to your aero-modelling community-based safety guidelines
- ⊘ **DON'T** fly model aircraft for payment or commercial purposes



For more information about safety training and guidelines, visit **www.knowbeforeyoufly.org**

For more information, visit
**www.faa.gov/uas**

**Federal Aviation Administration**

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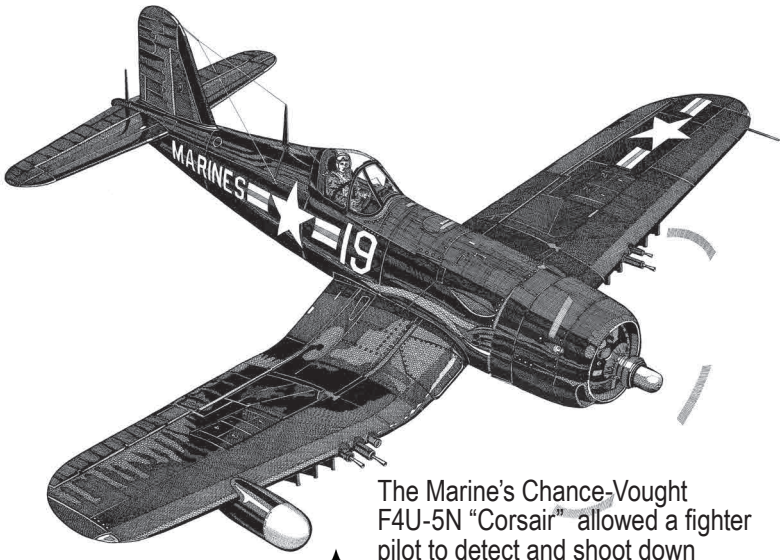
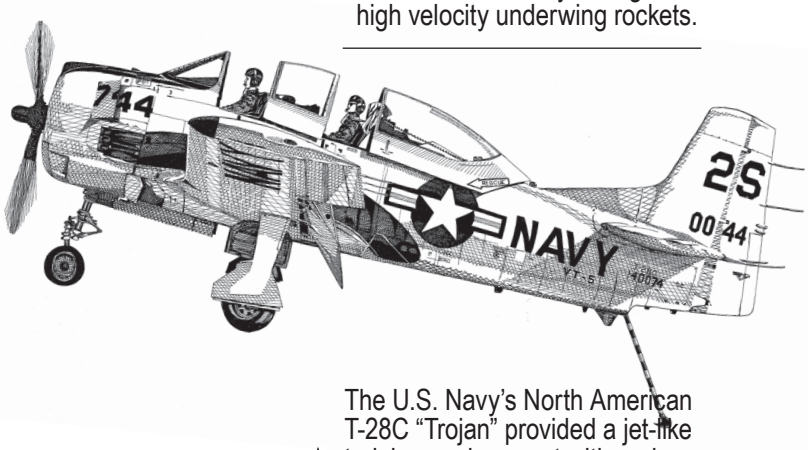
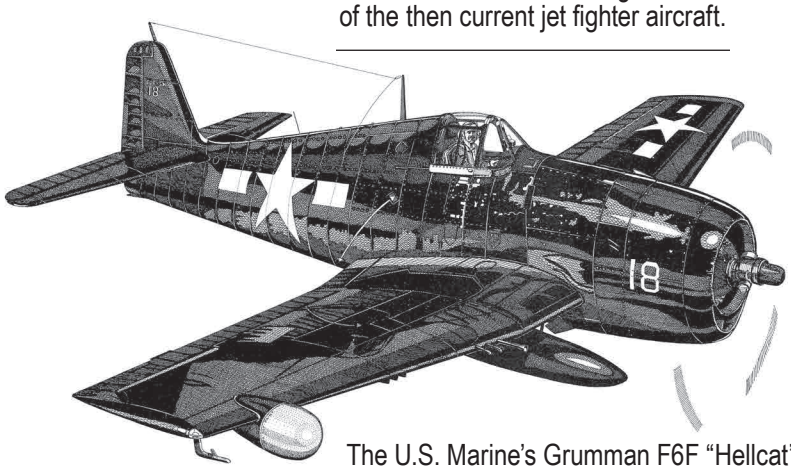



The Marine's Chance-Vought F4U-5N "Corsair" allowed a fighter pilot to detect and shoot down enemy aircraft while operating in total darkness during nighttime air-to-air combat missions. It could seek out and use a volley of unguided high velocity underwing rockets.




The U.S. Navy's North American T-28C "Trojan" provided a jet-like training environment with and airframe-engine combination that emulated the thrust-to-weight ratios of the then current jet fighter aircraft.




The U.S. Marine's Grumman F6F "Hellcat" was once considered a true fighter pilots dream. It ws an upgrade from the earlier Grumman "wildcat" fighter.

# The Magic of Straight Lines

## Meet George Dubick

His first conscious memory of an airplane was at about age three in 1942 when he was hoisted up to stand in the cockpit of a yellow biplane at the Cleveland, Ohio airshow. The smell of dope on fabric, the touch of the leather binding around the cockpit never left his memory. He noticed the squinty look of the pilot and immediately adapted that "pilot look." He then announced to his parents that he was going to be a pilot.

Eighteen years later he enlisted in the U.S. Air Force and joined the SAC (Strategic Air Command) Aero Club at Altus Air Force Base, Oklahoma. During his five years there, he obtained his private pilot license, then commercial pilot and flight instructor ratings and was preparing to obtain his instrument pilot's certificate immediately after separation from the service. He went on to become an instrument flight instructor.

He was hired by Allegheny Airlines as a copilot and later flew for Delta Airlines where he enjoyed thirty two years of flying everything from two and four engine propeller planes to two, three and four-engine jet aircraft.

Somewhere in the midst of all that flying, George Dubick discovered that he had a knack for pen and ink drawings.

"I started creating a list of favorite aircraft in pen and ink in 1983 through 1990 and took up the craft," He said. Then after a long pause he started drawing once again in 2014 as a relaxing and enjoyable "old time retired" pilot's hobby.

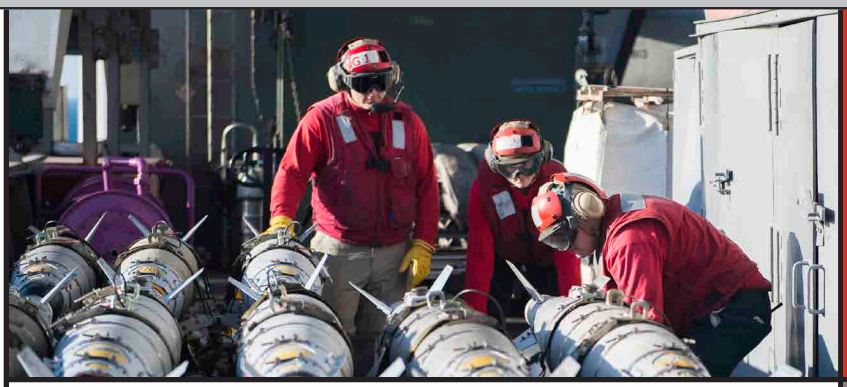
Today Dubick is a full blown artist who enjoys the craft not only as a hobby but as a lifestyle. His drawings, which have been featured on various websites, in magazines and museums, include various aircraft from the Navy, Marines and Air Force dating back to the 1980s.

*Editors Note: You can learn more about the artist and see more of his work at www.georgedubick.com.*

# MECH

Aviation Machinist's Mate 2nd Class Alexandra King performs routine maintenance on a MH-60R Sea Hawk helicopter of Helicopter Maritime Squadron (HSM) 37 aboard the guided-missile destroyer USS CHUNG-HOON (DDG 93). (Photo by Mass Communication Specialist 2nd Class Marcus L. Stanley)

BY CDR TOM GIBBONS, NAVAL SAFETY CENTER



# 10 Questions All Aviation Maintenance Leaders Should Ask

I have had the privilege to be associated with Naval Aviation Maintenance for more than three decades now. This includes duties in just about all facets and levels of leadership. From Vids Writer to CNATTU CO, I was exposed to myriad examples of good and bad practices that helped form my way of thinking.

This business is pretty amazing and very complex. We strive, and sometimes struggle, to meet the production goals that result in successful mission accomplishment. No matter the level of maintenance, we pride ourselves on doing it correctly and "by–the-book". Those practices equate to doing it safely, and meeting the mission safely is the goal of every leader in our enterprise.

So why do we consistently let unfortunate events resulting from bad decisions creep back in to our maintenance practices? Why are we running support equipment into airplanes?

Why are we damaging doors and flight control surfaces at an alarming rate? Why are we still using flimsy little fingers to align holes in much harder metal fittings (yes, for those of you that know me – I am missing a part of a finger - NO it wasn't from that!)?

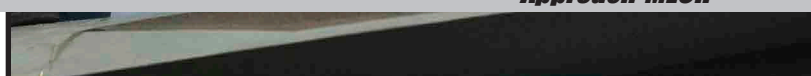
I say "we" because if these events are happening in our outfits, and they are, leadership needs to be accountable for correction and prevention. There are many reasons why these adverse events are happening under our watch. However we have the means to prevent them.

So here's a list of 10 "golden" questions that have helped me focus myself and my peers build a culture of professionalism and quality over the years:

**1** Do you lead by example? Trust me, the more senior you are, the more people are watching you.

**2** Do you give your people time to do proper maintenance? Real time, like the book says – not "I used to be able to do it in this amount of time".

**3** Do you set high expectations or practice acceptance of low standards? Something I learned a long time ago - accept mediocrity and you'll get exactly that. Set high goals!

**4** How are your communications skills? Are you open to other opinions and suggestions or are you too "experienced" to listen to others?

**5** Do you believe in training and putting it to task? Never stop learning - those that stop learning, fail! School house training is the tip of the iceberg. Real training happens on the flight line/deck, and in the work center. Allow your CDI time to train his replacement. Encourage, prioritize and build training it into planning.

**6** Are your leaders in the right places? Are they qualified and ready to be in that position? That can be a really hard question with difficult solutions!

**7** How do you do the basics? Do you correct people when the publication is not on the airplane? How about when the pre-op isn't signed and the paperwork isn't right? What happens when you see a technician with a screwdriver and flashlight in their pocket instead of a full tool pouch?

**8** Do you do pre-inspections tiger teams or program reviews? If so, why? The expectation should be that we are always inspection ready. Leadership involvement at all levels should be constant and correct. If we wait, we have already failed. Again, think about that. A side-note, if you do get kicked in the knees during an inspection because you were not quite prepared, it's okay in my opinion - as long as you learn from it.

**9** Do you practice TCRM/ORM or are they buzz words? ORM really works when given a chance.

**10** Are your people proud of what they do and where they work? Do they have REAL ownership in their hangar, airplanes, test bench, work center, etc.? Pride and ownership makes a big difference in professionalism and accomplishment.

So there you go. Sadly, countless WESS reports, HAZREPs, assessment results and OPREP-3's prove that in far too many cases, these questions and the associated answers are not practice.I am confident that one thing that is common across all of our lists is that doing Naval Aviation Maintenance right takes time. Training takes time, doing a pre-turn ORM brief takes time, following a publication step by step takes time.

Trust me, once a positive and just culture is established and all this invested time turns into efficiency and safety, you, or possibly your relief will realize the fruits of that investment. Leaders; stay engaged, train your folks, and take the time to give the time. It's worth it!

BY AT2 GRADY CALHOUN, VFA-27

# "I WAS SHOCKED"

As I reported to work, I was informed our integrated weapons team's leader (IWTL) was not feeling well and I may be responsible for the evening's required release and control (R and C) Checks.At first glance the process looks easy, however it can be time consuming and cumbersome. It involves several cables, a long checklist, and a few important steps, but nothing I hadn't done hundreds of times before.

The first of two R and Cs were performed by the IWTL with no incident. He managed to get the second one set-up before he "tapped out" and asked me to finish them up. I walked to the flight deck and began verifying everything was set up on the aircraft. For those unfamiliar, an R and C is used to verify the weapon system stations are communicating with the aircraft properly.

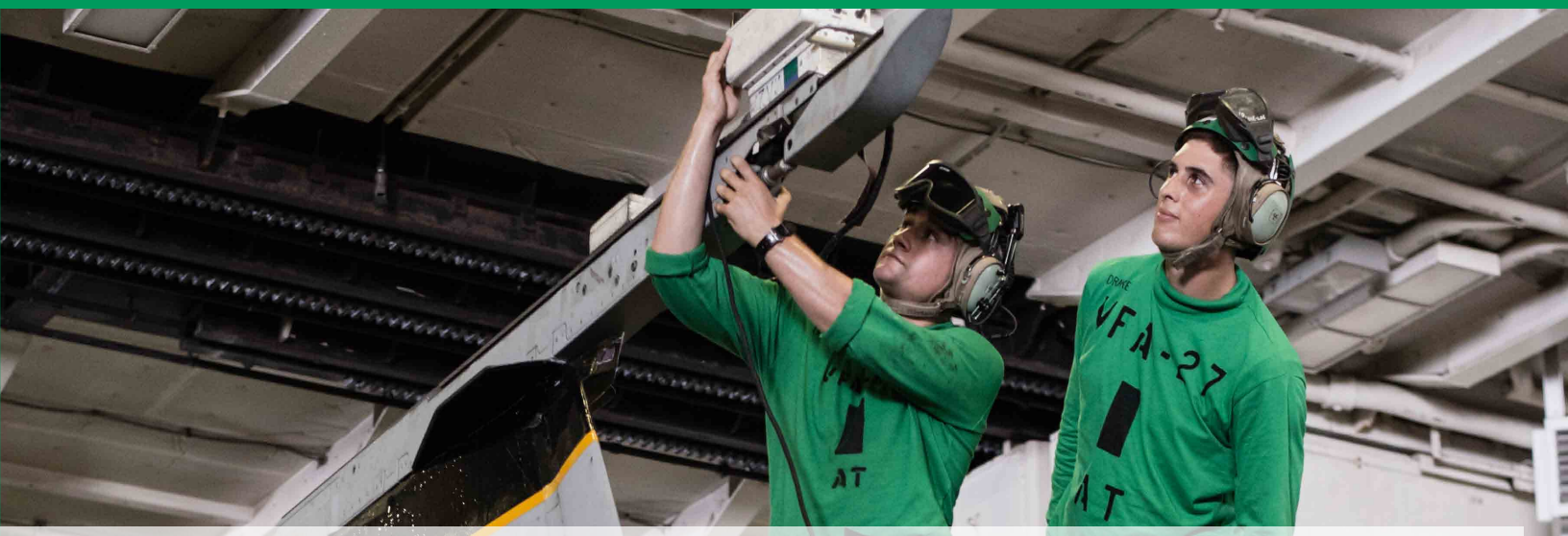
When performing the R and C check, it is common to check multiple stations using the same test gear. After one station's R and C is checked, the test gear is moved to the next weapon station for the next check. Depending on the aircraft configuration, between one to five stations will require testing. This particular aircraft was going to involve running an R and C on station one followed by the same test on the opposite wingtip station 11.

This setup requires connecting the aircraft weapons maintenance (AWM-103B) test set to station onewhile also connecting the AWM-103B to aircraft power via a connected W1 power cable. At the completion of the R and C on station one, it is common to move the AWM-103B to the next station with power still available via the W1 cable. I have completed or supervised this evolution countless times. However, I was not observing what was out of the ordinary this time.

The test on station one ran without a glitch. As my team member grabbed the AWM-103B to remove it from station one, he received an electrical shock. At the time, he failed to notify me or anyone else of the jolt, so we continued on with the release and control checks.

We completed the rest of the night's checks without issue. When I returned to work the following night, I was informed that my team member had been shocked the night prior and made a visit to medical due to numbness in his arm. My immediate question was "when and how did he get shocked?"

The next two days involved me testing and retesting gear as I chased an intermittent stray voltage gripe. At no point should anyone




be shocked by touching the housing of the AWM-103B, but my suspicions pointed me to a fault inside the test gear.

I went through multiple subcomponents of the AWM-103B and still couldn't figure out what was causing the intermittent stray voltage. Then I noticed a blue spark while disconnecting the W1 cable from the test set. I was shocked! Not an electrical shock, but rather I was surprised from suddenly seeing a spark in my face. I repeated the motions to verify I wasn't seeing things. The spark came from the W1 cable connector touching the lanyard of the connection point dust cap. It meant that the test set's housing was live!Other team members including myself had contact with the AWM-103B, so why hadn't we been shocked? Further investigation revealed when the test set was being removed, my team member also had his arm resting on the launcher.

This created a conduit between the test set and the grounded aircraft. We were fortunate no other instance such as this occurred with other team members. Now, the more important question to answer was why the AWM-103B's housing was live. After a thorough inspection of all the test gear attached to the test set, I discovered the power W1 cable connected to the utility power of the aircraft had shorted to shielding and ultimately "electrified" the AWM-103 housing.

There are no procedures to check this cable or determine the aspect of the housing. Even with a thorough visual inspection, there is little chance of noticing the cable was shorted to shielding. In addition, the A1-F18EA-LWS-220 checklist is used for all R and C checks. Following the checklist, it is normal to keep aircraft utility power on consistently during all R and C checks. If the power cable is shorted, anyone handling the AWM-103B during an R and C is at risk of being shocked.

It is uncommon to come across a W1 power cable that is shorted to shielding. However, without inspecting the cable(s) with a multi-meter or adding a step within the LWS-220 to pull the circuit breakers of the utility power when transferring the AWM-103B between stations, there is little certainty of the test set housing's electrical status. Luckily our team member was cleared for work that evening and had no long term negative effects.

We were fortunate no one else was shocked while troubleshooting the issue during the days that followed the incident. Even though it is not included in the checklist, I now pull the circuit breakers for the utility power prior to moving the test set. It adds a few seconds to an already cumbersome checklist, but the time spent is negligible compared to one of my team mates suffering a shock.

Finally, all shocks need to be reported immediately and the victim taken to medical. My team member ended up only suffering an electrical jolt through his arm. However, had the shock traveled through his organs serious complications could have resulted.

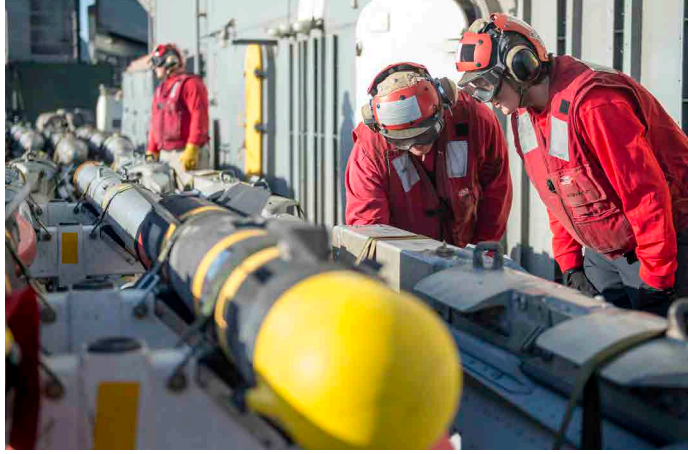
Complications can occur hours or even days later. It is always best to walk to medical on your own two feet than to end up the subject of a medical emergency.

Sailors with VFA-27 Royal Maces perform routine maintenance on an F/A-18E Super Hornet using AWM-103B gear. (Photo by LT Christopher Nigus)


↑ Sailors assist in moving a T-45C Goshawk assigned to Carrier Training Wing (CTW) 2 on the flight deck of the aircraft carrier USS DWIGHT D. EISENHOWER (CVN 69). (Photo by Mass Communication Specialist 3rd Class Anderson W. Branch)

← Aviation Support Equipment Technician 2nd Class Justin Mowery, crew chief for the U.S. Navy Flight Demonstration Squadron, the Blue Angels, prepares to launch the jets during a practice demonstration at Naval Air Facility El Centro, (Photo by Mass Communication Specialist 2nd Class Daniel M. Young)

↓ Aviation Electrician's Mate 2nd Class Samuel Sharp alerts the aircrew that an MH-60R Sea Hawk helicopter of Helicopter Maritime Squadron (HSM) 37 is leveled and ready to have the oil level checked aboard the guided-missile destroyer USS CHUNG HOON (DDG 93). (Photo by Mass Communication Specialist 2nd Class Marcus L. Stanley)



↑ Aviation Ordnanceman Airman Jaclyn Swanson, right, and Aviation Ordnanceman 1st Class Dustin Boudreau inspect ordnance on the flight deck of aircraft carrier USS HARRY S. TRUMAN (CVN 75). (Photo by Mass Communication Specialist 3rd Class J. M. Tolbert)

← Aviation Boatswain's Mate (Equipment) 3rd Class Ryan Pennell ensures an F/A-18E Super Hornet, assigned to the "Pukin' Dogs" of Strike Fighter Squadron (VFA) 143, is ready to launch from the flight deck of aircraft carrier USS HARRY S. TRUMAN (CVN 75). (Photo by Mass Communication Specialist 2nd Class Ethan T. Miller)

# Maintainers in the Trenches

↑ Sailors aboard the guided-missile destroyer let down flight deck safety nets prior to flight operations aboard USS CHUNG-HOON (DDG 93). (Photo by Mass Communication Specialist 2nd Class Marcus L. Stanley)

↑ Gas Turbine Technician (Mechanical) 3rd Class Moses Ofori inspects a fuel sample aboard guided-missile cruiser USS ANZIO (CG 68). (Photo by Mass Communication Specialist 3rd Class Jacob Richardson)

↓ Aviation Boatswain's Mate (Handling) 2nd Class Emmanuel Bonsu, from Accra, Ghana, directs an F/A-18E Super Hornet assigned to the Tophatters of Strike Fighter Squadron (VFA) 14 on USS JOHN C. STENNIS (CVN 74) flight deck. (Photo by Mass Communication Specialist 3rd Class Kenneth Rodriguez Santiago)

# MECH Bravo Zulu

## Sailors and Marines Preventing Mishaps

### AD2 SONCHEZ DULANEY, VFA-195

While conducting final checks on a VFA-195 F/A-18E Super Hornet, Petty Officer Dulaney discovered and immediately reported a popped delta-P on aircraft 407's port engine oil filter. Had this easy-to-miss discrepancy gone undetected the engine could have suffered catastrophic failure in flight, potentially resulting in a Class A mishap.

Petty Officer Dulaney averted a potential aircraft mishap and loss of life. His actions illustrate how every maintainer plays a crucial role in preserving life and equipment by preventing future mishaps.



### AM2 CALEB ISAACS, VFA-195

While conducting final checks on a VFA-195 F/A-18E Super Hornet, Petty Officer Isaacs discovered and immediately reported an out-of-limits hydraulic leak an aircraft port engine, which was parked over water on the flight deck. Had this easy-to-miss discrepancy gone undetected the aircraft could have suffered a loss of flight control redundancy and possible catastrophic engine failure in flight.

Petty Officer Calebs prevented a potential aircraft mishap and loss of life. His actions demonstrate the importance of every maintainer playing their part in preserving life and equipment by preventing future mishaps.


## AD2 PEDRO GAYTAN, VAW-113
## AE3 ZACHARY GAMEZ, VAW-113

After breaking down chains following an aircraft refueling and crew swap, AD2 Gaytan and AE3 Gamez were positioned outside the starboard engine nacelle aft of the propeller. There was an aircraft director under instruction that went in to pull chocks from the starboard main gear, and after he removed them, the trainee tripped forward towards the spinning propeller.

AD2 Gaytan, who was positioned between the trainee and the prop, firmly grabbed the trainee, preventing him from going forward into the prop, while AE3 Gamez pulled the back of the trainee's float coat to stop the forward momentum of both the trainee and AD2 Gaytan into the aircraft's moving propeller. AD2 Gaytan and AE2 Gamez's prompt reaction showed their attention to their surroundings while critical flight deck operations were taking place, and ultimately prevented serious injury to a fellow shipmate.

## AD3 ZACHARY MORRIS, VMFAT-101


While acting as a plane captain for an F/A-18D, AD3 Morris prevented a possible mishap by performing a meticulous aircraft preflight walk around. AD3 Morris noticed a leak coming from the main landing gear tire, despite the noise and activity of a busy flight line. AD3 Morris informed the pilot, the Commanding Officer, that he thought he had a leak and had narrowed the leak down to the valve stem. AD3 Morris quickly repaired the leaky valve stem along with the help and supervision of Cpl Burwell and ensured the tire was filled to the proper PSI.

Had AD3 Morris not noticed the leaky valve stem cover on preflight, the pilot in command could have found himself executing loss of directional control during take off or landing procedures from NATOPS. His attention to detail, initiative, and dedication to safety prevented a possible mishap.

**“Never stop learning. Those that stop learning, fail. School house training is the tip of the iceberg. Real training happens on the flight line, flight deck and in the work center. Leaders must encourage, prioritize and build training into planning.”**

**— CDR Tom Gibbons,**
**Naval Safety Center**