

INSIDE: The Pentagon and Congress battle over weapons buying. p. 36

AIR FORCE

MAGAZINE

The Perils OF HYBRID WAR

p. 24

A Century of Fighters at Selfridge p. 46

Joint Requirements for Joint Battles p. 54

Undeclared War on ISIS p. 40



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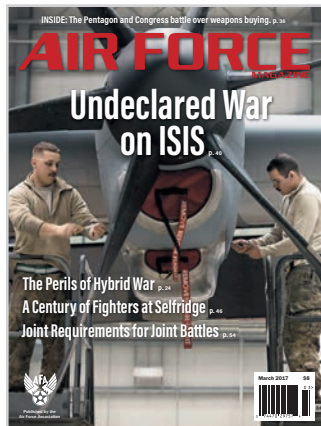
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Editor’s note: This issue of *Air Force Magazine* features four different covers, randomly assigned and distributed. Readers interested in purchasing additional copies of the magazine, or a complete set, should contact our Membership Department at 1-800-727-3337, or by emailing membership@afa.org. **About the covers:** A tactical air control party airman prepares for helicopter extraction. See “The Perils of Hybrid War,” p. 24. USAF photo. ★ A KC-135 fuels a Navy F/A-18. See “The School of JROC,” p. 54. USAF photo by TSgt. Larry E. Reid Jr. ★ An A-10 deploys flares. See “A Century of Action,” p. 46. Photo by Rick Llinares. ★ Maintainers work on a C-130J. See “Undeclared War,” p. 40. USAF photo by SSgt. Katherine Spessa.



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The Reality of Russia

WASHINGTON, D.C., JAN. 17, 2017

Every US President who has had to deal with Russian President Vladimir Putin began the relationship with high hopes. Successive American leaders were slow to catch on to what Putin really sought, however. He wants to be feared, unchallenged, able to lord over his neighbors. Putin only seeks cooperation with the US when it can help him.

Bill Clinton was fresh off a jovial relationship with Boris Yeltsin in 2000 when ever-closer US-Russian cooperation seemingly loomed. But Putin viewed the 1990s as a period of humiliation and soon told his military its mission included “restoring Russia’s honor and dignity.”

George W. Bush met Putin shortly after taking office in 2001. “I looked the man in the eye. I found him to be very straightforward and trustworthy,” Bush declared. “I was able to get a sense of his soul.” Putin later launched cyberattacks on Estonia and defeated Georgia in a small war.

Barack Obama came to power determined to “reset” relations with Russia. Putin illegally seized Crimea, launched a shadowy war in Ukraine, attempted to delegitimize the US election, and used Russian airpower to brutally defend Syrian dictator Bashar al-Assad.

Now it is Donald Trump’s turn. As President-elect, he often spoke glowingly of Putin while questioning the value of NATO.

Make no mistake: Putin will try to manipulate Trump.

Like Bush and Obama, Trump may be initially fooled by the scheming former KGB officer. Trump has a demonstrated fondness for strong personalities and is seemingly receptive to flattery. But he has other personality traits that could serve the US very well.

Trump prides himself on his deal-making talents and will not stand for being made to look weak. Putin’s idea of a reset would be a blatantly bad deal of the sort Trump despises—Putin wishes for Russia not to be punished for its aggressions and to keep what it has stolen.



Kremlin photo

Putin wants amnesty for theft and aggressions.

Clearly, Russia needs a fresh start with the US far more than the US needs another reset with Russia, so Trump begins his presidency from a bargaining position of power. As he wrote in his 2015 book, *Great Again: How to Fix Our Crippled America*, “Remember the principle strategy of negotiation: The side that needs the deal the most is the one that should walk away with the least.”

What does Putin want? Well, he recently demanded a reduction in the US military presence in NATO’s eastern nations, an end to sanctions, and quite comically, called for the US to compensate Russia for the economic losses that came from those sanctions. Putin also craves endorsement over Crimea.

What will Putin offer? Not much of lasting value. He can promise cooperation fighting terrorists, but in Syria Putin

Every American President has wanted better US-Russia relations. Putin does not.

rarely attacked ISIS while working to create a puppet state in Damascus. He could offer to negotiate a new Iran nuclear deal, but Russia itself has recently violated or abrogated several international agreements.

And Putin will surely turn on Trump if he needs the US as a scapegoat to shore up his popularity at home.

If Trump is conned into a bad deal with Putin, the US will have damaged NATO, upended the international order by bargaining away Ukrainian territory, and damaged the US by weakening some of its staunchest allies and trading partners.

Instead, Trump should demand that Russia honor the Intermediate-Range Nuclear Forces Treaty, cease its unpredictable and threatening military actions near America’s allies, end cyberattacks on the US, and get out of Ukraine. If Russia will not comply, Trump should reinforce the allies in Eastern Europe and ratchet up sanctions against Russia. Putin understands strength and will only respect the US when forced to do so.

“Right, as the world goes, is only in question between equals in power,” Thucydides wrote in his *History of the Peloponnesian War*, because “the strong do what they can, and the weak suffer what they must.”

The US has worked for 75 years to alter this brutal dynamic by defending freedom, security, and economic growth in Europe. Russia has shown a desire to bully, intimidate, overwhelm, and kill the weak.

Georgia, Moldova, Ukraine, and Finland have much to fear from Russia, as they lack NATO protection. Without American leadership, Estonia, Latvia, Lithuania, and Poland will also have much to fear.

Putin plays nice with US presidents while it works to his advantage, but will push until he is stopped. It is up to NATO, the US—and President Trump—to stop him. ★



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Born to Fly

As I read the “Retention Questions” article on p. 49 of the January 2017 issue of *Air Force Magazine*, I got to thinking. As far back as I can remember it seems the Air Force has gone through these swings of pilot shortages. I was not a flier but knew a lot of them. The one thing they all loved to do was fly. With the cutbacks in funds to fly, the flight crews are not getting to fly as much as they used to, and like to do, as well as stay current. Throwing bonuses at them to keep them in helps but I think giving them more flying time would really help.

The other problem is lack of people. Across the board our airmen and women are being forced to work long hours and are often gone on almost back-to-back deployments. I believe to a person they are willing to do the job. However it takes a toll on their personal and family life.

Congress needs to step up to the plate and fund not only the Air Force but all our military with the manpower and funds to do the job.

Col. Don Hengesh,
USAF (Ret.)
Petoskey, Mich.

Do you have a comment about a current article in the magazine? Write to “Letters,” *Air Force Magazine*, 1501 Lee Highway, Arlington, VA 22209-1198. (Email: letters@afa.org.) Letters should be concise and timely. We cannot acknowledge receipt of letters. We reserve the right to condense letters. Letters without name and city/base and state are not acceptable. Photographs cannot be used or returned.—THE EDITORS

Insanity Redefined

Regarding “Empty Racks,” January 2017, p. 28, Mr. Tirpak had a section titled “There Oughta Be a Law.” I was Active Duty ’83-’09 and was in the medical equipment repair field. As I read that section I truly could not recall when we didn’t do the Continuing Resolution two-step debacle during my career; I figured it probably happened a few times but I was only remembering when CR affected us. It was a tooth-pulling few months trying to secure funds for needed TDYs, repair parts, one-time contracts, etc., to keep equipment running (which in turn impacted patient care). I did a search and found on Wikipedia it was worse than I thought! Only three times between 1983 and 2015 did the budget actually pass on time!

Now the same Congress that is supposed to pass budgets—its job—is punishing the Air Force (and other services), affecting morale and performance, by denying them budget increases due to a law Congress itself wrote! Their dereliction of their responsibility is in turn costing significant amounts of money by delaying new aircraft purchases, as well as delaying arrival time. It’s insane. They keep denying big dollar cost savings—I’m going to say it—[such as] retiring the A-10—then add insult to injury by not passing a budget, in turn costing the services even more money problems.

The saddest thing of all is most budgets get well past 95 percent completed before 1 October, then more than the amount of time that was spent getting there is wasted dragging their feet over stupid little concessions no one wants to give into. It reminds me of basic training back in 1983—if one smoker lit up in the bathroom at night, all 50 troops in the flight suffered the consequences. In this case it isn’t even the Air Force

smoking and causing the problem, yet the Air Force suffers the consequences.

Seems Congress are the inmates in control of the asylum. Its processes and lack of job performance give a whole new meaning to the definition of insanity.

SMSGt. Mark Cipriano,
USAF (Ret.)
Elyria, Ohio

German Know-How

Your recent article “Our German Scientists” [January, p. 71] brought to mind my own experience with one of these scientists during my first assignment as a second lieutenant, assigned to the Materials Lab at Wright-Patterson AFB [Ohio] in 1963.

The article rightly described the postwar efforts to obtain equipment, personnel, and documents from the defeated Third Reich. I was elated that I would have the privilege to work with a leading German scientist in the field of aerospace materials. As I came to learn, the depth of his knowledge and the application of such knowledge remain a tribute to the quality of his academic education. [Albrecht] Herzog told me many stories of the Volkenrode, Braunschweig, aeronautical lab where he served as an assistant director. Fortunately, as key to his nonpolitical stance, he never joined the Nazi Party. He did admit that party members did

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seem to advance to higher positions more rapidly, but he insisted he was a scientist, not a politician. However, that early decision to devote his life to scientific pursuits paid unexpected dividends, as he was selected as one of the Paperclip scientists.

He told me that initially, the Paperclip scientists were interned at Wright Field in barracks surrounded by barbed wire-topped chain-link fences similar to POW conditions. Their first assignments entailed reassembly and calibration of all captured scientific equipment, including translation of pertinent technical documents. Once the equipment and documentation were assembled, sister services and industry personnel were invited to inspect and review this Third Reich technology and to freely use any portions of these items to enhance their own product technology as desired. This was only a small example of how this technology lead was shared with American industry to capitalize on that five- to 10-year technology advantage developed by the Germans.

Importantly, we were not alone in this quest for the treasure trove of German advanced technology. The Russians also had lists of key personnel, equipment, and documents representing both government and industry.

Herzog told me one story that demonstrated the determination of the Russians to also benefit from the German technology. He related that postwar, there was a scarcity of key foodstuffs including meats. His wife learned that there was a limited supply of meat in an adjacent town. He left on his bicycle to try to obtain some small amount of meat. While he was gone, a Russian tank pulled up outside his house and a Russian officer demanded Herzog. His wife told the officer that her husband was away and she wasn't sure of when he would return. The Russian told her he would wait. As this was not the Russian sector, it wasn't legal to kidnap personnel in Allied sectors. (Recall that postwar, Germany was divided into four sectors, including US, French, British, and Russian.) His wife was terrified when he didn't return promptly and she thought the worst. After a time, the Russian officer, knowing about Allied patrol schedules, angrily departed. Soon afterwards, Herzog returned and told his wife that the butcher shop in the adjacent town ran out of meat, so he had to pedal to another town to get the needed supplies. She related the story of the near

kidnapping and how fortunate they were that he wasn't home.

Herzog shared other stories of how technology was appropriated by the Russians. The Zeiss optical works in Jena, Germany, was within the Russian zone. The Russians carefully reconstructed the entire Jena physical facility in Russia. All equipment and technical support personnel were transferred to Russia. Several years later, Russia won international awards for the quality of their optical systems for cameras. Perhaps this was proof of successful technology transfer.

I remember asking Herzog, "Why wasn't the Braunschweig facility bombed by the Allies during the war?" He confirmed what your article stated, namely that the Allies did not know of its existence nor its location. The facility was indeed safely located in the forest.

Once he was integrated into the Civil Service working for the Air Force, Herzog continued his studies of behavior of rapid heating of advanced turbine alloys. Publication of these studies earned him several top technology achievement awards.

Before my assignment to Wright-Patterson AFB, I worked with a small firm producing advanced fibers for potential use in high performance composite structures. A diligent division chief of the Advanced Metallurgical Studies Branch of the Air Force Material Lab interviewed me and told me he had a scientist who was also working with high-strength fibers. He introduced me to Herzog, a GS-15 senior scientist, and we became involved in these advanced composite materials. Herzog's research also focused on exploiting these advanced fibers with properties exceeding anything experienced with conventional materials. The challenge was exciting to utilize materials which were four times stiffer than steel and up to 10 times stronger.

I had the privilege to work with a man who had earned the respect of the Air Force scientific community and had achieved that senior scientist rank from a near-POW beginning at Wright Field. We spent several years investigating advanced composites. I remain humbled by the opportunity the Air Force gave me to support Herzog, a Paperclip scientist's research, and to share many fascinating stories. As a friend and mentor, his guidance will always remain the highlight of my technical career. That guidance enabled me to become a more effective Air Force



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officer. Honoring an earlier pledge to his wife, he retired back to Germany to an honorary professorship at his university in Aachen.

Col. Wendell Meyerer,
USAF (Ret.)
Longwood, Fla.

Rebecca Grant hit another home run with her article on the effort to find and get German scientists, and the technology they had developed, to the US after World War II. To my knowledge, this subject hasn't ever received a lot of attention. Most people know about Wernher von Braun and some of his contributions to the space program. But that was just the tip of the iceberg. Some of the concepts that these men brought with them, or developed after they came here, are still in use today. The two books referenced in the article, *Operation Paperclip* and *American Raiders*, should be interesting reading. Thanks again for the outstanding article!

CMSgt Bill Leistiko,
USAF (Ret.)
Wichita, Kan.

Two articles in the January 2017 issue of *Air Force Magazine*, "44 Hours" [p. 33] and "Our German Scientists," were quite interesting as far as they went. In both cases, I was struck by the omission of references to the human component in weapon systems. For the 44-hour missions, the Biobehavioral Performance Branch of the Air Force Research Laboratory (AFRL) at Brooks City-Base in San Antonio provided applied research and development (R&D) and real-time guidance to the crews executing the missions. We created the Fatigue Avoidance Scheduling Tool (FAST) quantitative software designed primarily to support the scheduling of aircrew premission sleep and in-flight naps for these missions. The software made calculations based upon personal sleep histories of individual crew members, geophysical daylight-darkness cues en route, scheduled in-flight refuelings and bombing runs, and quantitative data about predicted human circadian rhythms, sleep length, sleep quality, etc. Dr. William F. Storm traveled a number of times to White-man AFB, Mo., from Brooks to help plan specific missions.

Perhaps the foremost German scientist who worked for the Air Force

was Dr. Hubertus Strughold. Prior to suspicions being raised decades later about his WWII participation in Nazi experiments, Strughold in fact pioneered space medicine in this country and made numerous contributions to R&D concerning aviation physiology. His work is said to have allowed men to walk on the moon. The research library at Brooks City-Base was named after Strughold, and he had an office in that building into the 1980s. Brooks closed as an Air Force facility in 2011. Strughold's name is no longer honored. However, the fact that a German scientist made such a contribution could have been mentioned in the article, perhaps with the proverbial asterisk.

It is rare that engineers receive training in how the human operator functions in a human-machine system. Thus, while the machine side of the system may be amazingly functional and reliable, the human-machine interface may be appallingly bad. I saw this combination a number of times in 1987-89 as chief of the Human Factors Engineering Branch for the Air Force Flight Test Center at Edwards AFB [Calif.]. This is not just a USAF problem, but one that plagues system development in nonmilitary institutions and in our sister services.

The omission of a mention of the human component in these two articles was quite consistent with the organization of the R&D component of the USAF acquisition system. Within AFRL, only one directorate, the 711th Human Performance Wing, focuses on the human component, while seven directorates focus on hardware and software. Within the Air Force Office of Scientific Research (AFOSR), only a portion of one of four divisions, Chemistry and Biological Sciences, focuses on the human component. This organizational structure for R&D seems quite out of line with the phrase within the USAF vision statement that states, "The World's Greatest Air Force—Powered by *Airmen*, Fueled by Innovation" (emphasis added). Perhaps a somewhat greater focus on R&D and acquisition on the human component in weapon systems is justified.

James C. Miller
Buffalo, Wyo.

A Hairy Situation

I was amazed to see the photo of Capt. Krystle Duckett letting her hair

down on p. 61 of the January issue. ["B-1, Better Than Ever," p. 54]. Is the current philosophy to not enforce grooming standards in the aircraft? Just saying.

Lt. Col. Randy Rothe,
USAFR (Ret.)
Colorado Springs, Colo.

I've been retired for a couple of years so I checked the AFI to see if there had been a change in female hair grooming standards. Apparently not, so what's up with Captain Duckett's hair?

Maj. Gen. Brett Williams
USAF (Ret.)
Durham, N.C.

New Times, New Rules

Re: *Air Force Magazine's* January 2017 news item: "Air Force Sets Transgender Policy" ["Air Force World," p. 18]. I hope our new Defense Secretary, James Mattis, calls a halt to social engineering experiments that sacrifice discipline for diversity. The Air Force's transgender policy is a perfect example of this insanity.

The policy states that transgender troops must use "lodging, bathroom, and shower facilities" in accordance with their Military Personnel Data System gender marker both before and after their transition. Do they need gender-neutral foxholes in combat situations? The policy also forbids "a commander to deny medically necessary treatment to a transgender airman." Does this mean Uncle Sam pays for gender reassignment procedures? If so, can taxpayers claim a deduction for equipment replacement costs? Just asking. I assume this policy, set under former Defense Secretary Ashton Carter, also applies to the Army, Navy, and Marines. His successor must revoke it.

Former SECDEF Carter earlier said the Pentagon will consider easing standards for tattoos and physical fitness to attract a wider mix of recruits who don't meet current requirements. That's like saying: "Don't raise the bridge. Lower the water." If basic rules don't apply to everyone in uniform, then they apply to no one. If you lower standards for tattoos and fitness, what's next? Can Rastafarian recruits wear dreadlocks? Will Muslim troops be allowed to grow long beards? Can former street gang members sport gang tattoos and colors? If everyone

in uniform does their own thing, you have a mob, not a military. Sacrificing discipline on the altar of diversity threatens our nation's security by putting political correctness ahead of combat readiness. End it ASAP.

Richard Reif
Flushing, N.Y.

Hoover Praise

Your article on Bob Hoover brought back fond memories ["Air Force World: Bob Hoover, 1922-2016," p. 20]. While at the 198th Fighter Squadron in the Puerto Rico Air National Guard, Bob Hoover accepted our invitation to participate in our anniversary activity at the ANG base in San Juan. Bob flew in on his Aero Commander and asked me if he could fly one of our F-86Ds to familiarize himself with the local area. I was to be his wingman on takeoff but at the runway end he signaled me to take the lead. We flew around the area for about 40 minutes or so and went back to the air guard base at San Juan. When I parked my F-86D at the ramp the crew chief asked me if I had gone crazy. Seems like Bob Hoover did a couple of rolls right after takeoff and all thought it had been me. What a great guy. Had him for dinner at my home that evening and one of the pilots brought a guitar. Bob knew all the raunchy tunes. We had a great evening with a great pilot.

Maj. Gen. Orlando Llenza,
USAF (Ret.)
Pembroke Pines, Fla.

Fun With Restoration

I thoroughly enjoyed the article in a recent edition about how they restored a B-52 (Ghost Rider) from storage at the "Boneyard" and got it back to full operational status ["Air Force World: Ghost Rider Returns to Minot," December, p. 18]. Eight years in the dry desert air and proper storage had kept the aircraft in very good condition.

However, not to take anything away from the efforts of all personnel involved, how about restoring a crashed C-130 abandoned and buried in the ice at the South Pole for 17 years?

According to the website <http://www.southpolestation.com/trivia/history/321/digout.html>, a Navy LC-130 (called "321" for its call sign) crashed on Dec. 4, 1971. The LC-130 that arrived four days after the accident to rescue the crew and brought a Navy accident-investigation team. The team's evaluation was that the extensive damage

and remoteness of the site made recovery impossible. The airplane was abandoned after being stripped of instruments and other equipment that could be easily salvaged."

The website says that over the years over seven meters of ice and snow buried the aircraft. In 1986 it was decided to rescue the airplane. After a lot of effort, this was accomplished and on 10 January 1988 she flew again!

SMSgt. Dave Caron,
USAF (Ret)
Las Vegas, Nev.

ANG vs. AFRC

I was disappointed that *Air Force Magazine* editors recently passed up an opportunity for an "informable moment" in the January 2016 "Letters" [p.8].

In his letter, retired Col. Robert C. Lilljedahl asked, "What happened to

the Air National Guard as a major command?"

Colonel Lilljedahl noted that in the "Photochart of USAF Leadership" (September 2016) ANG director Lt. Gen. L. Scott Rice was included under the Air Staff rather than with majcom commanders.

The Air Force currently has 10 major commands, of which the ANG is not one. The ANG is "a state militia air reserve component (ARC) of the United States Air Force" and as such reports to the Air Staff. Operating under Title 10 USC all ANG units are operationally gained by an Active Duty major command.

The Air Force Reserve, which the colonel also mentioned in his letter, is both a majcom and an ARC.

Col. Bill Malec,
USAF (Ret.)
O'Fallon, Ill

Senior Staff Changes

CONFIRMATIONS: To be General: James M. Holmes. To be Lieutenant General: Jerry D. Harris Jr.

To be ANG Major General: David P. Baczewski, Timothy J. Cathcart, Brian T. Dravis, James O. Eifert, Richard W. Kelly, Christopher J. Knapp, David M. McMinn, Jon K. Mott, Clayton W. Moushon, Kerry L. Muehlenbeck, Ronald E. Paul, Howard P. Purcell, David P. San Clemente, Jesse T. Simmons Jr., Randolph J. Staudenraus, Michael R. Taheri, Roger E. Williams Jr.
To be ANG Brigadier General: Joel E. DeGroot, Christopher M. Faux, Robert J. Gregory III, Henry U. Harder Jr., Eric W. Lind, Stephen C. Melton, David D. Zwart.

To be AFRC Major General: Craig L. LaFave, Pamela J. Lincoln, Donald R. Lindberg, Randall A. Ogden, Robert N. Polumbo, James P. Scanlan, Patrick M. Wade.

To be AFRC Brigadier General: Brian K. Borgen, William E. Dickens Jr., Kathleen M. Flarity, Jeffrey S. Hinrichs, Jay D. Jensen, Bret C. Larson, Todd J. McCubbin, Patrice A. Melancon, Ellen M. Moore, Boyd C. L. Parker IV, Steven B. Parker, Bryan P. Radliff, Scott A. Sauter, Constance M. Von Hoffman.

NOMINATIONS: To be ANG Brigadier General: Jerry D. Aebischer, Nathan B. Alholinna, Boris R. Armstrong, Kimberly A. Baumann, Robert L. Bell, Donald R. Bevis Jr., Shawn N. Bratton, Jeffrey L. Butler, Michael E. Callahan, Kevin J. Campbell, Thomas S. Cauthen, Lawrence L. Christensen, Shawn A. Clouthier, Gerald K. Colmer Jr., Darwin L. Craig, Robert C. Desko, John R. DiDonna Jr., Kevin M. Donovan, Bobbi J. Doorenbos, David N. Dziobkowski, Randal K. Efferson, Howard L. Eissler III, Shawn D. Ford, Jed J. French, Daniel E. Gabrielli, Mark P. Gaul, Rainer G. Gomez, Patrick M. Guinee, Penny C. Hodges-Goetz, Jeremy C. Horn, Cassandra D. Howard, Paul D. Johnson, Edward S. Jones, Gary W. Kirk, Heidi L. Kjos, Meaghan Q. LeClerc, Gregor J. Leist, Suzanne B. Lipcaman, Paul S. Lyman, Keith G. MacDonald, Rolf E. Mammen, Gerald E. McDonald, Christopher G. McGraw, Michael R. Morgan, Rebecca L. O'Connor, Jeffrey L. Ryan, Jon S. Safstrom, William L. Sparrow, James R. Stevenson Jr., Jeffrey D. Storey, Bryan J. Teff, Edward L. Vaughan IV, April D. Vogel, Charles M. Walker, Christopher S. Walker, David B. Walker, David A. Weishaar, Wendy B. Wenke, Gregory T. White, Jeffrey J. Wiegand, Brent W. Wright, William T. Yates, Daniel S. Yenchesky.

CHANGES: Brig. Gen. William T. Cooley, from Program Exec., Prgms. & Integration, Missile Defense Agency, Redstone Arsenal, Ala., to Cmdr., AFRL, AFMC, Wright-Patterson AFB, Ohio ... Brig. Gen. Michael A. Guetlein, from Sr. Materiel Leader, Remote Systems Directorate, SMC, AFSPC, Los Angeles AFB, Calif., to Program Exec., Prgms. & Integration, Missile Defense Agency, Redstone Arsenal, Ala. ... Brig. Gen. Kevin B. Kennedy, from Dir., Cyberspace Ops. & Warfighting Integration, Office of Info. Dominance & CIO, OSAF, Pentagon, to Dep. CIO, C4 & Info. Infrastructure Capabilities, OSD, Pentagon.

War by other means; Trolling for votes; Sources and methods; Nuclear superiority

A UNANIMOUS INTELLIGENCE DECISION

The US Intelligence Community issued a rare public report in early January, explaining its unanimous judgment that Russian intelligence, under the direct orders of President Vladimir Putin, conducted a massive effort to interfere with the US presidential election, mainly through social media and the selective leaking of hacked information. It was the boldest example yet of Russia's move toward achieving its ends through hybrid warfare.

The report was released the day after a hearing of the Senate Armed Services Committee (SASC) on cybersecurity, where outgoing Director of National Intelligence James R. Clapper explained Russia's influence campaign within the US.

"Russia's goals were to undermine public faith in the US democratic process, denigrate Secretary [Hillary] Clinton, and harm her electability and potential presidency," said the unclassified version of the report, released late on Jan. 6, hours after a secret version was briefed to President-elect Trump.

"We further assess Putin and the Russian government developed a clear preference for President-elect Trump. We have high confidence in these judgments," read the report, issued by Clapper on behalf of the CIA, FBI, National

any tampering with ballots or voting machines or hacking of other vote-counting technology.

Trump, issuing a statement after his briefing, called it a "constructive meeting." He said, "While Russia, China, other countries, outside groups, and people are consistently trying to break through the cyber infrastructure of our governmental institutions, businesses, and organizations, including the Democratic National Committee [DNC], there was absolutely no effect on the outcome of the election."

Clapper would not comment directly on whether Russia had managed to sway the election, saying simply that it is not the place of the intelligence agencies to assess how the electorate was influenced by the disinformation campaign.

The Intelligence Community said Russia's goals in this campaign were both broad and specific. Broadly, Putin wanted to advance Russia's "long-standing desire to undermine the US-led liberal democratic order"—that of free and fair democratic elections and free speech—which he saw as "a threat to Russia" and his regime.

WHY HIM, NOT HER?

Moreover, "Putin most likely wanted to discredit Secretary Clinton because he has publicly blamed her since 2011 for inciting mass protests against his regime in late 2011 and early 2012, and because he holds a grudge for comments he almost certainly saw as disparaging him," the report said. Clinton had also orchestrated sanctions against Russia for the invasion of Ukraine and the seizure of Crimea. Along with falling oil prices, the sanctions severely damaged the Russian economy.

In Trump, meanwhile, Putin saw an opportunity "to achieve an international counterterrorism coalition" against ISIS. He'd also had "many positive experiences working with Western political leaders whose business interests made them more disposed to deal with Russia," such as former Italian Prime Minister Silvio Berlusconi and German Chancellor Gerhard Schroeder.

"Pro-Kremlin proxy Vladimir Zhirinovskiy, leader of the nationalist Liberal Democratic Party of Russia, proclaimed just before the election that if ... Trump won, Russia would 'drink champagne' in anticipation of being able to advance its positions on Syria and Ukraine," according to the report.

The report summed up the findings as follows: "Moscow's influence campaign followed a Russian messaging strategy that blends covert intelligence operations—such as cyber activity—with overt efforts by Russian government agencies, state-funded media, third-party intermediaries, and paid social media users, or 'trolls.' Russia, like its Soviet predecessor, has a history of conducting covert influence campaigns, focused on US presidential elections, that have used intelligence officers and agents



Clapper offers the consensus view.

Security Agency, Department of Homeland Security (DHS), and other agencies.

DISINFORMATION VS. VOTE-CHANGING

Although Russia hacked "and maintained access to elements of multiple US state or local electoral boards," the DHS said those "targeted or compromised were not involved in vote tallying." The Intelligence Community said it didn't detect



Photo by Gage Skidmore

Trump: Hacking had “no effect.”

and press placements to disparage candidates perceived as hostile to the Kremlin.”

A NEFARIOUS, STATE-CONTROLLED WEB

The National Intelligence Council said Russia’s strategy was to use its military intelligence organization (called the GRU) to hack the DNC and people associated with Clinton, then feed anything embarrassing to Julian Assange’s WikiLeaks website. Stories would next appear on the government-sponsored RT (formerly Russia Today) network and other websites. The GRU then used paid internet trolls to create and spread social media campaigns to further distribute the stories on Facebook, Twitter, and other media. In some cases the information was factual, in others it was exaggerated or wholly contrived, but it was given the look of real news.

The unclassified report cited mostly open-source information about how items originating on RT were disseminated through social media. In one of more than a dozen bulleted examples: “On 6 August, RT published an English-language video called ‘Julian Assange Special: Do WikiLeaks Have the Email That’ll Put Clinton in Prison?’ and an exclusive interview with Assange entitled, ‘Clinton And ISIS Funded by the Same Money.’ RT’s most popular video on Secretary Clinton, ‘How 100% of the Clintons’ “Charity” Went to ... Themselves,’ had more than nine million views on social media platforms.”

Other conclusions were based on classified information, and Clapper waved off discussing those in an unclassified setting, saying sources and methods are “fragile” and the US would have to “kiss that off” if they were exposed. They would be almost impossible to reconstitute, because opponents would rapidly move to block the leaks. This was particularly true of cyber attributions, he said.

The intelligence estimate held that the Russians became convinced in October that Clinton would win the election and shifted their campaign from promoting Trump toward “undermin-

ing her expected presidency,” “crippling” it from the start, and questioning the legitimacy of the election.

The report said Russia had conducted “cyber operations against ... both major US political parties” in the 2016 election, as well as “think tanks and lobbying groups they viewed as likely to shape future US policies.”

Russia “collected on some Republican-affiliated targets but did not conduct a comparable disclosure campaign,” the report added, but it did not offer a judgment on why Russia withheld this information.

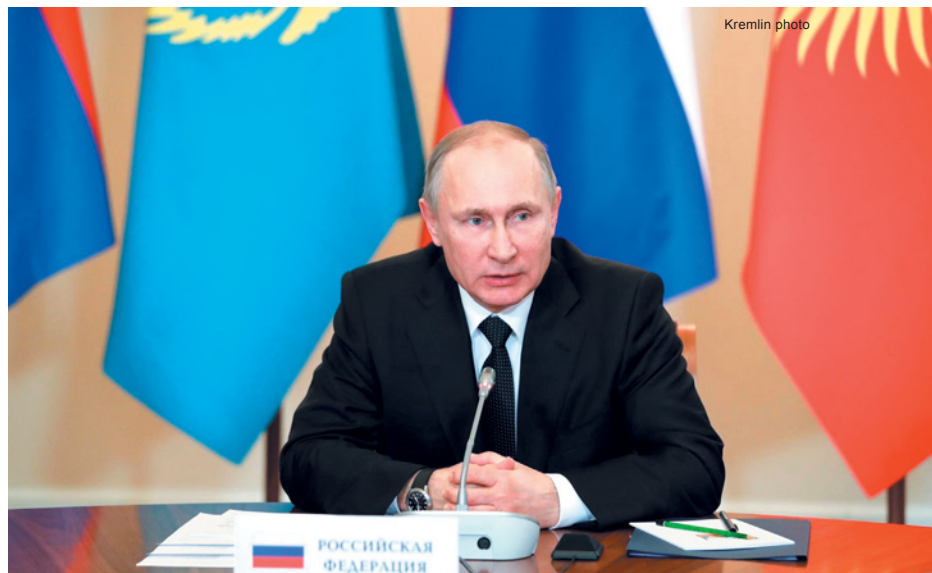
NEW NORMAL

The report concluded with a judgment that Russia’s behavior in the 2016 US election marks the start of a “new normal” in Russian interference in the politics of its adversaries.

“We assess Moscow will apply lessons learned from its Putin-ordered campaign aimed at the US presidential election to future influence efforts worldwide, including against US allies and their election processes.” It has already used these techniques with effect in some Western European countries and in former Soviet-bloc republics.

At the SASC hearing, chairman Sen. John McCain (R-Ariz.) decried the absence of a strategy in dealing with hack attacks from foreign governments and criticized the Obama administration for failing to establish clear-cut rules as to “what constitutes an act of war” in the cyber domain. He called Obama’s expulsion of Russian diplomats and other sanctions in response to the election tampering a weak response that won’t deter Russia or other countries, such as China and North Korea, from cyber espionage or election-tampering campaigns such as the one Clapper described.

Clapper said cyber retaliation is fraught with peril, because it’s hard to gauge what will happen as a “counter-retaliation.” Clapper said he’s a “big fan of sanctions” as a tool to punish such cross-domain campaigns and cyber attacks. He also acknowledged that the US, too, conducts cyber espionage and warned that “people in glass houses” might think twice before “throwing rocks.”



Kremlin photo

Putin insists on meeting the five-year goal.

Sen. Lindsey O. Graham (R-S.C.), running with that metaphor, said, “It is time now not to throw pebbles but to throw rocks.”

RED STAR RISING

Russian President Vladimir Putin’s annual address to his defense leaders showed clearly that he’s aiming for a military not just equal to that of the US, but superior to it. Putin suggested a continuation of the aggressive policies of recent years where Russia used military force to subdue independence-minded or pro-Western neighboring governments.

In the Dec. 22, 2016, speech, a transcript of which was made available by the TASS state-run news agency, Putin said he expects the Russian military to meet his goal of having a 70 percent modern military—both conventional and strategic forces—by 2021. He instructed it to develop nuclear weapons that can overcome any potential defenses.

“We need to enhance the combat capability of the strategic nuclear forces,” he said. These must be “guaranteed to penetrate existing and future missile defense systems.” He said strategic non-nuclear forces “must also reach a new level of sophistication, so as to neutralize any military threats Russia may face.”

Though there’s much to do to strengthen Russia’s nuclear triad, missile warning, intelligence, surveillance, and reconnaissance, and ground and naval forces, Putin insisted, “Today we are stronger than any potential aggressor. I repeat, any aggressor.”

In the speech, Putin said the Russian military has made good progress toward modernizing, urging his leaders to “maintain momentum.” In nuclear forces, he said 60 percent are modernized already. He mentioned a series of exercises and “four snap inspections of combat readiness” that have demonstrated the quickness and increased efficiency of conventional forces. These exercises have “reaffirmed that our military units can be quickly deployed ... large distances ... in strategic directions,” he said.

NATO leaders have said these snap inspections, conducted without prior notice, have put alliance forces on alert and driven them to adopt a posture of deterrence, not merely reactive readiness. (See “Bears Watching,” September 2016, and “NATO’s New Reality,” October 2016.)

Putin wants close tracking of “any changes in the balance of forces and military-political developments” in the world,

especially on the Russian border, and “timely action to adjust plans so as to neutralize potential threats our country may face.”

He touted the success of Russian forces in Syria, saying they have “passed the test of counterterrorist struggle.”

Syria and Russia refer to all opponents of the Bashar al-Assad regime in Syria as terrorists, making no distinction between groups such as ISIS and the Free Syrian Army that seeks to install a democratic Syrian government.

The military services of Russia must be modernized in a “balanced” fashion, Putin said, urging all to “assimilate high precision weapons” as quickly as possible, along with “the latest communication, intelligence technology, means of [command and] control, and electronic warfare.”

Putin urged close cooperation between the military and armaments industry, warning of heavy repercussions if it fails to perform. Referring to the 2021 modernization goal, he said, “Five years is not a long period for a program of this scale. Any delay in its implementation can have a disruptive effect on the production chain that will be very hard to put back on track. For this reason, any failure in the execution of contracts must be subject to severe sanctions.”

In addition to a push for modernization, Putin signaled an increase in training and its realism.

ARMS SHOW?

The success of Russia’s weapons in Syria “offers new possibilities” for arms sales and cooperative weapons programs with other countries, Putin said, urging that “full use” be made of these opportunities.

“We know that foreign partners are very much interested in Russian weapons,” he asserted. Russia has been trying out new weapons in the Syrian fight, ranging from a new long-range cruise missile to satellite guided munitions comparable to the US satellite guided Joint Direct Attack Munition, or JDAM.

Putin said he’s done much to provide for “the well-being of the army personnel,” boasting that “people on the waiting list to obtain housing from the Defense Ministry dropped 2.8-fold since January 2012.” He told his defense leaders that “caring for army personnel and providing better social guarantees for soldiers and officers is ... the most important contribution to training a new generation of defenders of the Fatherland.”

Lastly, Putin urged no letup in the push to modernize, saying there’s no time for even “a single significant mistake.” ★

Su-30M fighters are part of Russia’s big push to modernize and dominate.



Russian Federation Ministry of Defense photo

Fasten Your Seatbelts

The defense and aerospace industry is off to a bumpy start with President Donald Trump, who put two high-profile programs in his sights in the weeks leading up to his inauguration and signaled that he could take a very unorthodox approach to buying aircraft and other military hardware.

During the presidential campaign, Trump, then the GOP nominee, pledged to boost defense spending by tens of billions of dollars annually to modernize the US military and give it a bigger technological edge against rivals around the world.

Since winning the election, however, Trump has expressed little patience for the Pentagon's arcane and heavily regulated acquisition processes, expressing frustrations with price tags for the F-35 strike fighter and the Air Force One replacement programs, in particular.

What's more, the real estate mogul has signaled he intends to get involved in negotiations himself, an unusual move for a Commander in Chief, as presidents typically have little to say about the particulars of weapons contracts.

Trump, who has bemoaned the cost of the F-35 and Air Force One programs in a series of tweets since the election, is a different breed of President, more accustomed to the boardroom than the congressional hearing room. But Trump, who has spent his life in the private sector, is likely not quite clear on what he's getting himself into.

Indeed, there are many layers of bureaucracy—and many bureaucrats—between the President and the contracting officials who negotiate and sign agreements for defense programs. Meanwhile, the Pentagon must, by law, abide by



Tweeting the strike fighter.

an extensive set of policies and regulations that in no way resembles the kind of deal-making Trump is used to in commercial real estate.

Nonetheless, Trump has used Twitter, his preferred medium, to call out the two programs, in the hopes of cutting costs on both multibillion-dollar efforts. F-35 maker Lockheed Martin and Boeing, which is expected to build Air Force One, both saw immediate hits to their stocks following Trump's tweets.

But the companies' responses to the then-President-elect were somewhat muted, as they mulled the unprecedented nature of not only Trump's tweets but also his intended involvement and interest in Pentagon acquisition.

David F. Melcher, president of the Aerospace Industries Association, suggested after an industry lunch in December that defense firms should not overreact to Trump's tweets.

"This is a relatively new phenomenon," said Melcher, who sat down with Trump several months ago to discuss the industry's priorities. "I know the right answer is not going to be [to] tweet back, so don't expect us to be doing that."

Indeed, instead of tweeting back, Lockheed Martin CEO Marillyn Hewson and Boeing CEO Dennis A. Muilenburg found themselves summoned to meet with Trump in December.

Muilenburg called his meeting with Trump a productive and open discussion and pledged to produce the two Air Force One jets currently planned for below the \$4 billion estimate that has been panned by Trump—though current Pentagon estimates already have the total cost for the program well below that amount.

"We're going to get it done for less than that, and we're committed to working together to make sure that happens. And I was able to give the President-elect my personal commitment on behalf of the Boeing Company," he told reporters after the meeting. "This is a business that's important to us."

The President-elect himself boasted that he would cut costs on the huge, triservice F-35 program.

"We're just beginning. It's a dance," he said. "It's a little bit of a dance. But we're going to get the costs down and we're going to get it done beautifully."

The next day, Trump upped the ante with Lockheed Martin, tweeting that he had asked rival Boeing to price out a "comparable" F/A-18 Super Hornet, carrier-based fighters that are currently flown by the Navy. The tweet underscored his aggressive negotiation tactics, but also highlighted his unfamiliarity with some of the intricacies of Pentagon acquisition.

Indeed, Trump will not have final say over the awarding of defense contracts, even as Commander in Chief of the armed forces. Only a warranted contracting officer, which the President is not, can sign off on contracts.

The layers of bureaucracy between the President (or any other political figure, for that matter) and the contract officer exist for good reason: to prevent any undue political influence on the process. ✪

Megan Scully is a reporter for CQ Roll Call.

Airmen not alone; Covering reachback; Avoiding the steamroller; Continued evolution

THIN BLUE LINE

There are hundreds of airmen assigned to individual augmentee billets or to joint expeditionary taskings in the Central Command area of operations.

Lt. Col. Sang Kim's job is to take care of them.

Kim, commander of the 387th Air Expeditionary Squadron, said he and his staff are the "Air Force blue line" for about 300 airmen with more than 60 Air Force specialties, scattered throughout about 10 countries.

The squadron "oversees those airmen, to make sure they're taken care of, that they have the right training, the right gear, that they're not alone," said Col. Charles D. Bolton, commander of the 386th Air Expeditionary Wing.

That assistance comes in the form of administrative support and other organize, train, and equip functions, Kim said. The staff also makes sure the airmen are being used properly in their jobs, and if there's a problem, they will engage with the airmen's leadership on his or her behalf.

"Some airmen are kind of by themselves at certain locations," Kim said, so if the unit didn't exist, those airmen wouldn't have anyone to reach back to if, for example, they need a cold-weather jacket or legal help.

"That's where we come in and help them out," Kim said.

At one point during Operation Iraqi Freedom and Operation Enduring Freedom, there were 2,000 to 3,000 JET (joint expeditionary tasked) and individual augmentee (IA) airmen deployed and "all sorts of issues" associated with that, Kim said.



TSgt. Ronald Gowen, a logistician assigned to the 387th Air Expeditionary Squadron, helps unload a C-17 in Southwest Asia.

"That's why the AES [air expeditionary squadron] construct started to grow, to have that blue line connection with our JET and IAs, to make sure that they're being taken care of and not just being steamrolled in any way," Kim said. "There's a lot of behind-the-scenes things that our guys do to take care of our JET and IAs.

USAF photo by SrA. Zachary Kee



First responders with the 386th Expeditionary Civil Engineer Squadron perform medical evacuation training.

YOU'VE COME A LONG WAY, BABY

Bolton said the Air Force has "come a long way to get our arms around taking care of them."

For example, if an airman from Little Rock AFB, Ark., embeds with an Army unit in Irbil, Iraq, he or she could be the only airman there, said Bolton. "So who does that person have helping them, supporting them? We do that," he said.

The JET and IA airmen could be tactical air control party personnel, security forces, intelligence, pilots, logistics, or any other specialty the joint staff or other service unit needs. Frequently, Kim said, an Army or Marine ground unit or joint staff unit will be looking for "the airpower mentality that obviously the Air Force brings," and requesting an airman is like hitting "the easy button."

Since the airmen are spread out over a large geographic area, maintaining 100 percent accountability can be a challenge, Kim said. Some may be in a different location than they had originally deployed to, and the numbers in the region change every day.

But, Bolton said, the squadron does a great job of "taking care of all those airmen," making sure they get the mail, that they have someone to talk to if they have a legal concern, or just "to make sure the Air Force family is still with them."

The overall JET and IA mission "continues to evolve," Kim said, and while there are about 300 in his squadron now, the battle to reclaim Mosul, Iraq, has increased their numbers.

"The requirement is steadily increasing, so likewise, our squadron grows with that requirement," he said. 🌟

Jennifer Hlad is a freelance journalist based in the Middle East and a former *Air Force Magazine* senior editor.



READY TO KEEP GPS III ON TRACK.

For GPS III, Boeing can deliver a seamless and technically proven digital payload solution. Based upon the successful 702 satellite series, Boeing's GPS digital payload is simpler to integrate and test, offering a resilient, modular, flexible product with proven reliability. Add Boeing's 40 years of GPS experience, and you've got a one-of-a-kind commitment to keeping GPS III right on track while further modernizing this vital service.





01.18.2017

A B-2 from the 509th Bomb Wing, Whiteman AFB, Mo., is prepared for takeoff on a mission against ISIS targets near Sirte, Libya.



USAF photo by SrA. Joel Pfister

By Wilson Brissett, Senior Editor

■ **Off We Go—on the T-X**

The Air Force released the final request for proposal (RFP) for the T-X advanced pilot trainer on Dec. 30, launching a competition that is expected to pit a half-dozen major contractors against one another for a contract worth in excess of \$16.3 billion. The award, expected in 2017, would be for 350 jets and a ground-based training system to replace the T-38 fleet. The Air Force wants initial operational capability in 2024 or sooner.

According to the RFP, the award will cover development and production of the first five aircraft, plus mission planning systems, ground support gear, and initial spares. The first two lots of production jets would be at a low rate, followed by nine more lots at full rate, likely to be about 37 jets per year. “T-X is a program we’ve got to get right,” Air Force Chief of Staff Gen. David L. Goldfein said in an accompanying statement.

Boeing/Saab, Northrop Grumman, and Sierra Nevada/Turkish Aerospace Industries are offering new-design aircraft for the competition, while Lockheed Martin is offering the

T-50A variant of the Korean Aerospace Industries T-50 trainer and Raytheon is bidding the T-100 variant of the Leonardo (formerly Alenia Aermacchi) M346 Master. Textron is reported to be considering offering a modified version of its Scorpion jet—which in its present configuration doesn’t meet USAF’s G-loading requirements—and service officials suggested that other, surprise offerors may join the contest.



USAF photo by Amn. Tristan D. Vigilanco

■ **Traffic Control Mistake Caused Collision**

An F-16CM and a private Cessna collided in July 2015 because neither aircraft could see the other and there was poor direction by an air traffic controller, causing the aircraft to crash. The pilot and passenger of the small plane were killed.

The F-16, assigned to the 20th Fighter Wing at Shaw AFB, S.C., was traveling to Charleston, S.C., when a controller directed the Viper to turn 180 degrees near a small airfield near the town of Moncks Corner. A Cessna 150M had taken off and was ascending into the path of the F-16. The Air Force pilot had an obstructed view and insufficient time to avoid a collision.

The investigation found that the controller’s direction to send the F-16 to a nearby uncontrolled airfield and the pilot’s nonuse of additional systems (such as those that scan for civilian transponders) contributed to the crash.

The crash killed Michael Johnson, 68, and his son Joseph Johnson, 30, both of Moncks Corner. The pilot ejected and sustained minor injuries.



National Transportation Safety Board photo

■ **F-35 ANG Candidate Bases Announced**

The Air Force has named five installations as candidates to become the second and third Air National Guard homes for the F-35A. They are: Montgomery Regional Arpt. (Dannelly Field AGS), Ala.; Boise Air Terminal (Gowen Field AGS), Idaho; Jacksonville Arpt./AGS, Fla.; Selfridge ANGB, Mich.; and Truax Field/AGS, Wis., according to a press release.

USAF said it would select preferred and alternate locations this spring. Environmental impact studies will be performed and a final decision will then be made. The F-35A will begin arriving at the selected bases in the mid-2020s.

The 158th Fighter Wing at Burlington Arpt./AGS, Vt., is slated to receive the Guard’s first F-35s in fall 2019. The Air Force also previously named three Active Duty operational locations for F-35A basing, including Hill AFB, Utah; RAF Lakenheath, UK; and Eielson AFB, Alaska.



USAF photo by SrA. Devante Williams

■ Holmes Confirmed To Lead ACC



The Senate confirmed Lt. Gen. James M. "Mike" Holmes to receive his fourth star and lead Air Combat Command. Holmes, currently the deputy chief of staff for strategic plans and requirements, will take over from Gen. Herbert J. "Hawk" Carlisle, who is retiring. Carlisle has led ACC since October 2014.

Holmes is a command pilot with more than 4,000 hours, mostly in F-15s.

■ USAF Approves Lockheed GPS Ground Control System

The Air Force approved Lockheed Martin's design for an upgrade to the existing GPS ground control system, which will now enter risk reduction, the company announced. This upgrade is being performed under a \$96 million contract approved in February 2016 and will enable the current system, built to operate GPS II satellites, to also operate the next generation GPS III. Lockheed Martin is building those satellites. The first is scheduled for launch this year.

The upgraded control system provides a temporary solution until the next generation Operational Control System (OCX) is completed. OCX is being built by Raytheon, but its progress was delayed in July when a Nunn-McCurdy breach was declared because the program exceeded the 25 percent cost overrun threshold. In October, a Government Accountability Office report recommended the OCX program increase transparency by establishing clear milestones and clarifying its acquisitions strategy.



USAF photo by A1C Mike Meares

■ Moving Forward With JSTARS Recap

The Air Force released the final request for proposal to industry for the JSTARS recapitalization program. The RFP "includes all aspects of the system, including the airframe, radar, communication systems, and battle management command and control suite," according to an Air Force news release.

The service intends to award a contract in Fiscal 2018 for three engineering and manufacturing development (EMD) Joint Surveillance Target Attack Radar System (JSTARS) recap weapon systems for testing, with options for low-rate initial production of two more aircraft and full-rate production of four aircraft each in Lots 1 to 3, bringing the total fleet to 17 aircraft.

The contract will include options for "ground support, such as training systems, mission planning and processing systems, system integration labs, support equipment, and spares," stated the release.

Initial operational capability for the JSTARS recap is slated for 2024. Northrop Grumman, Boeing, and Lockheed Martin recently completed an 11-month pre-EMD phase, helping to assess the "maturity of subsystem technology," stated the release, and reduce the risk of weapon system integration. The Air Force released a memorandum to industry and a draft RFP in September 2016—the same week the current E-8 JSTARS fleet, made up of 16 Boeing 707s dating to the 1960s, reached one million flight hours.



USAF photo by SrA. Miles Wilson

■ Thunderbird Felled by Sticky Button

The Thunderbirds aerial demonstration team F-16 that crashed in Colorado on June 2—minutes after a flyby of the Air Force Academy graduation attended by President Obama—was done in by a stuck button on the throttle, the service announced.



USAF photo by Dave Meade

Normally the throttle won't move all the way to cutoff unless the button is depressed, but the button had become stuck in the depressed position due to accumulated metallic debris, stray lubricant, a misaligned clevis pin, and wear on the spring mechanism, USAF's official accident investigation found.

The pilot, Maj. Alex Turner, inadvertently rotated the throttle to the engine cutoff position, and by the time he realized what had happened, was too low to restart the engine, though he attempted to do so. Turner delayed ejection for a few seconds to steer the jet away from a house. He ejected with only minor injury, was picked up, and was later introduced to Obama.

Turner was returned to flying duty. Though the jet, tail No. 92-3890, seemingly landed upright and largely intact, it was declared a total loss, at a value of \$29.5 million. Technical orders have been changed to require a more thorough regular inspection of the mechanism and the proper alignment of the pin.

■ Flexing Air Force Muscles in the South China Sea

US bombers and fighters, in mid-December, flew a show-of-force sortie over the South China Sea that included one B-52H, two B-1Bs, four F-15Cs, seven tankers, and a US Navy guided missile destroyer as tensions are raised in the region.

The operation was a “routine small force training sortie” that included several forward operating bases in the region. The B-52 was one of three that deployed from Minot AFB, N.D., to Andersen AFB, Guam, on Dec. 3 for a 15-day rotation. The Stratofortresses at the base were in addition to the B-1s already forward deployed as part of the Air Force’s continuous bomber presence to the Pacific. The B-52s flew 15 sorties during the short deployment, the news release stated.

The B-52 also participated in the Phoenix Black exercise in Australia during its deployment.

USAF photo by SSgt. Benjamin Consier



USAF photo by A1C Ian Dudley

■ Lockheed Gets \$60 Million for ICBM Modernization

Lockheed Martin received a new contract and the Air Force extended a second, worth a combined total of more than \$60 million, to revitalize the Air Force’s Minuteman III reentry systems. The awards include a \$50 million, four-year fixed-price contract covering seven reentry field support equipment units and additional support equipment. Another \$10.6 million contract extends an existing deal for ICBM reentry vehicle integration and modernization, according to a Lockheed Martin press release.

The contracts come as the Air Force seeks to modernize its Minuteman III fleet to keep it viable until its replacement. A request for proposal for the Ground Based Strategic Deterrent system went out last fall, with development expected in the late 2020s and an expected cost of about \$62 billion.

Gen. Seth J. McKee, 1916-2016

Seth Jefferson McKee, who was four-star head of North American Air Defense Command from 1969 to 1973, headed US Forces Japan, and was a World War II combat pilot, died in Scottsdale, Ariz., Dec. 26, 2016, at the age of 100.

McKee, born in McGehee, Ark., started his military career in 1935. He joined the Missouri National Guard, ostensibly to earn money for a medical education, but became an aviation cadet and earned his wings in 1939.

He trained to fly the P-38 Lightning and was a test pilot at Knoxville Field, Ala., and then Orlando, Fla. He finagled an assignment to Europe and got into World War II, flying bomber escort missions. On D-Day, as a lieutenant colonel, he led a group of 40 P-38s providing air cover for troops on the beaches at Normandy. At the time of his death, he was the highest-ranking veteran of Operation Overlord, according to the *Arizona Republic*.

During the war, he flew 69 missions and destroyed two enemy aircraft. McKee was an accomplished attack pilot, destroying numerous armored vehicles, trains, artillery, airfields, and other

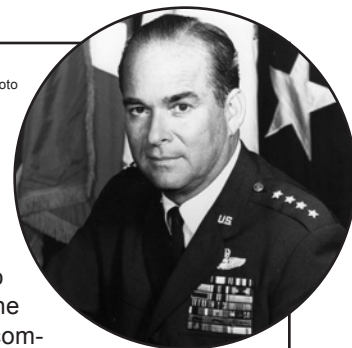
ground targets. He was named commander of the 370th Fighter Group in Europe in November 1944.

After the war, McKee completed his college education and returned to Europe as a technical advisor to the Italian air force and later served as commander of the 36th Fighter Bomber Group. He commanded the 2nd Bombardment Wing and served as deputy director of plans for Strategic Air Command, Offutt AFB, Neb.

In 1966, he took command of US Forces Japan and 5th Air Force. Two years later, he became assistant vice chief of staff and in 1969 received his fourth star as head of NORAD and US Aerospace Defense Command in Colorado.

In addition to the Distinguished Service Medal, Silver Star, three Legions of Merit, and the Distinguished Flying Cross, McKee received decorations from allied nations. In November 2016, he was made a Chevalier in the National Order of the Legion of Honor, France’s highest honor.

USAF photo



US Central Command Operations: Freedom's Sentinel and Inherent Resolve

Casualties

By Jan. 19, a total of 33 Americans had died in Operation Freedom's Sentinel (Afghanistan), and 33 Americans had died in Operation Inherent Resolve (Iraq and Syria).

The total includes 63 troops and three Department of Defense civilians. Of these deaths, 29 were killed in action with the enemy while 37 died in noncombat incidents.

There have been 145 troops wounded in action during OFS and 29 troops in OIR.

Effective Support or Overreliance on Airpower?

Air Force commandos need to walk a fine line in delivering air strikes to support the Iraqi advance against ISIS, between providing effective help and having the Iraqi army rely too much on coalition aid, a USAF tactical air control party officer said Dec. 16. The airman, who spoke to defense reporters on background about airpower in Operation Inherent Resolve, said US joint terminal attack controllers in Iraq and Kuwait work with Iraqi officials to approve every air strike that helps the Iraqi troops advance in their ground operation.

US airmen, who number in the dozens and are located in "strike cells" far removed from the front lines, help the Iraqi army plan. However, the majority of strike targets come from Iraqi troops on the frontline as opposed to US intelligence and surveillance. "We don't want to tell them what would be a good target for their operation," the Air Force officer said. "It defeats the purpose of emboldening their army."

An Air Force team gets Iraqi approval for strikes, which go through an extensive vetting process. But too much reliance on Americans in the fight could be "hindering their fortitude," he said. It's the Iraqi army's fight, with US support. Air strikes are needed to "get them to act" without counting too much on US troops.

ISIS has proved to be a "frustrating" enemy to fight, because it depends on innocent civilians for cover. "They're in a city. If you hide your rifle, you [appear to be] a civilian. How do you get around that?" the officer asked, explaining that it takes patience and sustained intelligence to develop and ensure effective targeting.

Iraqi Forces Have Claimed a Quarter of Mosul

As of mid-December, Iraqi forces had retaken about a quarter of the ISIS-held city of Mosul, an approach that was moving slowly because of a "360 degree" threat from the group, including car bombs and tunnels. US Army Lt. Gen. Stephen J. Townsend, commander of Combined Joint Task Force-Operation Inherent Resolve, said Dec. 14 that Iraqi forces claimed half or more of the eastern side of the city with a heavy fight expected as they moved west.

"I believe that the enemy is faced with a very stark choice," Townsend said. "If he wants to fight and die, then he's made that decision; he'll stay there. If he wants to get out to try to fight again another day, if he wants to get out to try to go back home and stop fighting, he's going to have to make that choice soon as the Iraqi security forces approach."

US and coalition air strikes have killed or seriously wounded more than 2,500 ISIS fighters since mid-October, and strikes targeting the group's financial operations have cost the group between \$4.5 million and \$6.5 million per month. "We've conducted various strikes out there," Townsend said. "I don't require a lot of justification for doing that. There is [ISIS] out there that needs killing, so we're killing them."

US Sending More Troops to Syria

The US is building up its presence inside Syria, sending 200 more special operations troops to continue assisting in the advance on ISIS' self-proclaimed capital. Defense Secretary Ashton B. Carter said he requested the additional troops as part of a new phase in the fight, focused on expelling ISIS from Raqqa.

The troops "play a vital role in helping to identify, build, and then enable the force that will expel [ISIS] from Raqqa and be a critical part of destroying [ISIS] here in Iraq and Syria, which we must do and which we will do," Carter said Dec. 11 during a briefing at Qayyarah West Airfield in Iraq.

There were already about 300 troops inside Syria embedded with Syrian Democratic Forces advancing on the capital. US troops had also been embedded with Turkish forces.

Coalition Jets Kill Planners of 2015 Paris Attacks

US-led coalition jets on Dec. 4 took out three senior ISIS leaders, including two involved in planning the Nov. 13, 2015, attacks on Paris, according to defense officials. The strike on the ISIS-held city of Raqqa, Syria, killed Salah Gourmat and Sammy Djedou, who helped facilitate the attacks that killed 130 people in multiple locations in Paris.

The strike also killed Walid Hamman, a suicide attack planner who helped organize a 2015 terror plot in Belgium that was disrupted, Pentagon spokesman Peter Cook said in a statement. The targets were "working together to plot and facilitate attacks against Western targets at the time of the strike." Coalition aircraft have recently killed five external plotters, disrupting the group's ability to plan attacks outside Iraq and Syria, Cook said.

US Ends Counter-ISIS Operation in Libya

US Africa Command on Dec. 19 ended its support for the Libyan Government of National Accord after conducting 495 air strikes in an effort to drive ISIS from the city of Sirte. Operation Odyssey Lightning began on Aug. 1 as ISIS took over the seaside city. US aircraft, mainly Marine Corps jets from USS *Wasp* and remotely piloted aircraft, flew regular air strikes as Libyan troops moved from neighborhood to neighborhood to clear the city.

While the official operation has concluded, US Africa Command said in a statement it will still work with the Libyan government to counter the "evolving threat" of ISIS in the country. AFRICOM's announcement came one day after the Libyan government officially said ISIS was expelled from Sirte, though officials warned the fighting was not completely over in the country.

30,743

The number of bombs dropped on ISIS in 2016 by US and coalition aircraft in Operation Inherent Resolve.

By the Numbers

John H. Glenn, 1921-2016

John Herschel Glenn Jr.—a Marine Corps fighter pilot, test pilot, astronaut on missions 36 years apart, US Senator from Ohio, and 1984 presidential candidate—died Dec. 8, 2016, at the age of 95.

Glenn grew up in New Concord, Ohio, graduating from high school in 1939 and proceeding directly to Muskingum College, where he studied engineering. For extra credit in a physics course, he earned a private pilot license. In 1941, after the attack on Pearl Harbor, he quit college and enlisted in the Air Corps, but when he was not called to duty, in 1942 he applied to be a naval aviation cadet.

During advanced aviation training, he was asked to transfer to the Marine Corps and agreed. He flew the R4D transport, the F4F Wildcat, and the finally the F4U Corsair. He shipped out to the Marshall Islands in 1944, there flying 59 missions and earning two awards of the Distinguished Flying Cross and 10 Air Medals.

He earned a regular commission at the war's end and elected to stay in the Marine Corps, flying on weekends to maintain proficiency when his regular duties kept him from the cockpit.

Glenn was sent to the Korean War as a major in 1952. In his first tour there he flew the F9F Panther, performing reconnaissance and ground-attack missions. He then applied to be an exchange officer with the Air Force and flew the F-86F Sabre. He shot down three MiGs in July 1953, the last month of the war. He received two more awards of the Distinguished Flying Cross and eight more Air Medals for action in Korea.

While still there, he applied to be a Navy test pilot and after the war tested the FJ-3 Fury, F7U Cutlass, and F-8 Crusader. He famously set a transcontinental speed record in the Crusader, averaging supersonic speed—3.5 hours coast-to-coast—despite slowing down for three aerial refuelings. The mission earned him a fifth DFC.

Glenn contributed to the nascent space program even before becoming an astronaut, participating in capsule design and astronaut testing development while at NAS Patuxent River, Md. Though just shy of the age cutoff (40 years old) and lacking a technical degree, he was picked as one of the original seven Mercury astronauts in 1959.

He became the fifth man in space—and third American—in 1962. The mission was a nail-biter, as technicians received an indication early in the flight—the first manned mission aboard the Atlas booster—that Glenn's heat shield, critical for re-entry, had come loose. They cut the planned nine-orbit flight short, and the re-entry and landing were normal.

NASA photo



The US had been lagging behind the space achievements of the Soviet Union, and Glenn's three-orbit "Friendship 7" flight put the two countries on seemingly an even footing. The famous phrase "Godspeed, John Glenn," was uttered by fellow Mercury astronaut M. Scott Carpenter at the outset of the flight.

The success earned Glenn national recognition and a ticker-tape parade in New York City, and he received the rare honor of being asked to address a joint session of Congress. His alma mater, Muskingum College, conferred his bachelor's degree diploma that same year.

Though many outside NASA believed Glenn would be given the opportunity to be the first man to walk on the moon, NASA deemed him too valuable a national hero to be risked in further space missions, and his age—by then he was 42 years old—was against him. He left NASA in 1964.

After one unsuccessful attempt, Glenn was elected to the US Senate from Ohio in 1974—a seat he would hold until 1999. He chaired the science and technology committee for many years and served on countless advisory boards regarding NASA and national space goals.

Glenn re-entered the national consciousness with the hit 1983 movie, "The Right Stuff," about the early space program. He was portrayed by actor Ed Harris. In 1984, he sought the Democratic presidential nomination, but came in second to Walter F. Mondale.

In 1998, Glenn persuaded NASA to allow him to fly on the space shuttle—ostensibly to study the effects of microgravity on geriatric physiology—and he became, at 77, the oldest person ever to fly in space.

He was awarded the Congressional Gold Medal in 2011, and in 2012, President Obama awarded him the Presidential Medal of Freedom, the nation's highest civilian honor. At the time of his death, Glenn was the sole surviving astronaut of the Mercury program.

In a statement, Obama said the nation had "lost an icon." "The last of America's first astronauts has left us," Obama said, but their example "compels us to keep reaching for the heavens."

Glenn is to be buried at Arlington National Cemetery in April.

By Robert S. Dudley

Loud and Clear, Take 1

"I've heard his message loud and clear about reducing the cost of the F-35. I gave him my personal commitment to drive the cost down aggressively."—**Lockheed Martin Chief Executive Officer Marillyn Hewson, after meeting with then-President-elect, now President Donald J. Trump, quoted in dodbuzz.com, Jan. 3.**

Loud and Clear, Take 2

"We've heard him [President Trump] loud and clear, that he's going to be looking for options [for destroying ISIS forces]."—**Gen. David L. Goldfein, USAF Chief of Staff, USA Today, Jan. 2.**

Day of the Jackals

"This is not an organized operation that is hacking into a target. ... It's more like a bunch of jackals at the carcass of an antelope. Is it Russian? Probably some. Is it Chinese and Iranian? Maybe. ... It's much more complicated than that [i.e., a Russia-only operation]. I think that the possibility that there's more than one country involved [in cyber attacks during the recent US election] is really there."—**Former CIA Director R. James Woolsey Jr., remarks on the CNN program "New Day," Jan. 3.**

Over the Waterfall

"This is just the start of a waterfall that's going to cascade down. We're watching the forecast [for pilot retention], and it's going to start dropping precipitously, starting at the end of this year. It will be as bad as we're seeing it in other weapons systems."—**Gen. Carlton D. Everhart II, head of Air Mobility Command, on a growing shortfall of airlift and tanker pilots, quoted in Air Force Times, Jan. 5.**

Theater of the Absurd

"Security Council Resolution 2334 explicitly condemns [the presence of Israelis in] East Jerusalem. This is not just scandalous; it's absurd. America acquiesces to a declaration that, as a matter of international law, the Jewish state has no claim on the Western Wall, the Temple Mount, indeed the entire Jewish Quarter of Jerusalem? They belong to Palestine? The Temple Mount is the most sacred site in all of Judaism. That it should be declared foreign to the Jewish people is as if the Security

Council declared Mecca and Medina to be territory to which Islam has no claim."—**Syndicated columnist Charles Krauthammer, on President Obama's failure to stop Resolution 2334 with a veto, The Washington Post, Dec. 29.**

Bass Ackwards

"The current US-led coalition strategy is to secure the sovereignty of Iraq *before* decisively dealing with the Islamic State in Syria. This is precisely backwards. Rapid and comprehensive air attacks can still liquidate the capacity of the Islamic State to wage war. ... The first and most promising option is to put in place an overwhelming and focused set of attacks to crush the Islamic State in a matter of weeks—not episodic, anti-septic bombing."—**Retired USAF Lt. Gen. David A. Deptula, former deputy chief of staff for ISR, USA Today, Jan. 2.**

Power and Principles

"There might be some who say, 'Let's just unleash this military [on ISIS] and let them just go.' If that unleashing results in us backing away from our values, then the longer-term consequences ... will outweigh any short-term value. We go to war with our values."—**Gen. David L. Goldfein, USAF Chief of Staff, interview with USA Today, Jan. 2.**

Soviet Union, Revisited

"We're most certainly not in a Cold War with Russia, because we're not fighting an ideology [i.e., Marxist-Leninist communism] that seeks to conquer the world. We're not fighting proxy wars against each other around the world. ... So that's how things are different."—**Michael McFaul, US ambassador to Russia during 2012-14, quoted in defenseone.com, Dec. 30.**

Ship of Fools

"As I briefed the results of this study to various groups, some challenged our most basic assertion—that air superiority matters. Some even went so far as to say they didn't think the United States would need air superiority in 2030. ... Many can no longer conceive of a world in which US air superiority is not a given, where we must fight for it."—**USAF Brig. Gen. Alex Grynkeiwich, F-22 pilot who led the recent Air Supe-**

riority 2030 Flight Plan effort, op-ed in warontherocks.com, Jan. 3.

Distant? Dead. Close in? Dead

"I flew the F-35 [in training] against other fourth generation platforms, and we killed them and they never even saw us. If you were to engage an F-35 in, say, a visual dogfight, ... the capabilities of the F-35 are absolutely eye-watering. ... The airplane has unbelievable maneuvering characteristics that make it completely undefeatable in an air-to-air environment. So if it's a long-range contact, you'll never see me and you'll die. If it's within-visual-range contact, you'll see me and you're gonna die and you're gonna die very quickly."—**USAF Brig. Gen. Scott Pleus, director, F-35 Integration Office, quoted in businessinsider.com, Jan. 5.**

Snowden's True Colors

"It was not the quantity of Mr. Snowden's theft [of secret material from the National Security Agency] but the quality that was most telling. Mr. Snowden's theft put documents at risk that could reveal the NSA's Level 3 tool kit—a reference to documents containing the NSA's most-important sources and methods. Since the agency was created in 1952, Russia and other adversary nations had been trying to penetrate its Level-3 secrets without great success. Yet it was precisely these secrets that Mr. Snowden changed jobs to steal."—**Intelligence expert Edward J. Epstein, on the NSA turncoat Edward Snowden's claim to be merely a whistleblower, not a spy, The Wall Street Journal, Dec. 30.**

On the March

"Pyongyang is much further along in its missile development than most people realize. ... The liquid [fueled] engine test was astounding. For years, we knew that North Korea had a Soviet R-27 missile engine design. They re-engineered the design of that engine to double its propulsion. ... 2016 marked the year North Korea truly ramped up its WMD [weapons of mass destruction] program. I think we're going to see a flight test [of an ICBM] in 2017."—**Melissa Hanham, weapons researcher at Middle Institute of International Studies, Monterey, Calif., quoted in Reuters dispatch, Jan. 2.**

THE PERILS OF HYBRID WAR

By Peter Grier

THE “little green men” were one of the first signs of Russia’s strategy. Commandos wearing green uniforms stripped of insignia, they occupied key government institutions in Crimea during the early months of the Ukrainian crisis of 2014.

For a time, their ambiguous identity allowed Russian leaders to deny that Moscow had launched a military offensive to seize the Crimean Peninsula and its Black Sea ports.

But these Russian Special Forces were not the only indication Moscow had launched a complex, multifaceted operation in the region. That October, as Ukraine neared a crucial snap parliamentary election, electronic advertising billboards in the capital of Kiev suddenly began showing a video accusing Ukrainian politicians of war crimes. Then they displayed graphic images of civilians killed in the eastern part of the country.

The electronic network had been compromised by a shadowy, pro-Russian group of hackers.

Russia also relied on conventional forces to push for its objectives. Regular infantry units eventually took the place of the little green men in Crimea. Russian artillery and military personnel crossed into Ukraine proper to help pro-Russian insurgents seize and hold strips of territory in the Donbass region in the country’s east.



The situation in the Donbass remains violent and unsettled. But one thing is clear: Russia's intervention in Crimea and the Ukraine is a textbook example of hybrid warfare, the combination of unconventional means (subversion, cyber attack) with conventional might to reach a geostrategic objective.

Hybrid war may be the most likely type of conflict the US and its allies will face in the near future. In part that is because of the increasing prevalence of state sponsorship of revolutions and insurgencies in weak, crumbling, or vulnerable regions of the world.

Hybrid warfare is a way for a stronger power to keep its involvement in such fights hidden as much as possible. Its fist becomes visible only if necessary, near the end.

Both Russia and, to a lesser extent, the Islamic State have used hybrid war approaches in recent years. Their efforts have affected an arc of crisis from Ukraine down through Iraq and across to Syria. For the US and its allies that has meant trouble on NATO's northern and southern flanks.

OLD TRICKS

"Hybrid warfare is a probe, a test of our resolve to resist and to defend ourselves. And it can be a prelude to a more serious attack, because behind every hybrid strategy, there are conventional forces, increasing the pressure and ready to exploit any opening," said NATO Secretary General Jens Stoltenberg in a 2015 speech.

Hybrid war as a concept is nothing new, of course. It is as old as the trick misdirection of the Trojan horse. According to Stoltenberg, the difference is that today the scale is bigger, the speed

But as a concept to illuminate modern conflict, hybrid war may date back to the Israeli-Hezbollah War of 2006. This 34-day conflict took the vaunted Israel Defense Forces by surprise. The IDF had grown used to fighting small unit counterterror operations in the West Bank and Gaza Strip. In Lebanon, it encountered a Hezbollah backed by Iran, employing highly disciplined and well-trained cells outfitted with powerful anti-tank missiles and other modern weapons.

At the battle of Wadi Salouqi, Hezbollah used these capabilities with deadly

The US and NATO are still trying to figure out how to respond to "hybrid warfare."

and intensity is higher, and the danger is right at the gates of the western alliance.

Technology has taken the complexity of hybrid war to a new level. Cyber and information war in the age of spear phishing emails, Twitter, and YouTube has increasingly become a form of warfare unto itself.

precision, damaging 18 Merkava tanks. Guerillas even managed to launch a few armed drones. Meanwhile Hezbollah flooded the information space with battlefield photos and videos and propaganda about kidnapped Israeli soldiers.

The IDF inflicted more physical damage on its enemy and won many

Unidentified military personnel—"little green men"—hefting AK-74Ms blockade a military base near Simferopol, Ukraine, in 2014.



Photo by Anton Holoborodko

encounters at the tactical level. But the court of public opinion in Israel, Lebanon, and the rest of the world saw Israel as the loser.

“As a hybrid force, Lebanese Hezbollah was able to use its internal strengths of narrative, weapons mix, and tactics to overcome the weaknesses of its much stronger opponent,” concludes a 2013 Joint Special Operations University report on hybrid warfare.

In the wake of Israel’s 2006 strategic setback, many western military analysts intensively studied what had happened to determine where a proud, highly trained, and modern armed force had gone wrong. They found that in part the Israelis simply were not prepared for Hezbollah’s spectrum of advanced weapons. But some felt that the IDF might not have precisely understood the overall nature of the conflict. It wasn’t all-out combat, analogous to the 1973 Yom Kippur War. It wasn’t a rock-throwing intifada.

It was something else.

It was a combination of elements. A hybrid war.

Retired Marine Reservist Lt. Col. Frank G. Hoffman was among the

first theorists to begin using the term “hybrid war” to refer to this hydra-headed concept. He referred to it as a “blurring of modes of war, the blurring of who fights, and what technologies are brought to bear.”

In this definition, hybrid war involves both nations and nonstate forces. Its violence can span the spectrum from intense regular unit combat to guerrilla warfare and terrorist acts. It can slot in criminal kidnapping and theft and, increasingly, cyber warfare.

It can employ state sponsorship of existing local unrest and the manipulation of currencies and other means of economic aggression. Diplomacy and propaganda play a part.

Hoffman began talking about this concept as early as 2005. He called it “unprecedented synthesis” in an article in *Proceedings* cowritten with Marine Corps then-Lt. Gen. James N. Mattis, now the new Secretary of Defense.

“In hybrid wars we can expect to simultaneously deal with the fallout of a failed state that owned but lost control of some biological agents or missiles, while combating an ethni-

cally motivated paramilitary force, and a set of radical terrorists who have now been displaced,” wrote Hoffman and Mattis. “We may face remnants of the fielded army of a rogue state in future wars, and they may employ conventional weapons in very novel or nontraditional ways.”

Hybrid war might feature attacks against US critical infrastructure or transportation networks. It could involve an electronic takedown of military or financial computer networks, Hoffman and Mattis wrote.

Many others have contributed to the development of the hybrid war concept. Some are not Western and may loom as potential adversaries. In 2013, Valery Gerasimov, current Chief of the General Staff of the Russian armed forces, published a journal article outlining his views on 21st century conflict. Much of his vision resembled hybrid war.

The rules of war have changed, and the importance of nonmilitary means of reaching political and strategic goals has grown, Gerasimov wrote. He said the broad use of such means—coupled with the use of “military means of



Above: A story published in the second issue of the ISIS magazine. The issue featured a cover shot of a blood-smeared dagger, and inside were pictures of beheadings and slaughter and articles on picking the best weapons for terrorist attacks. Right: An advertisement in the magazine promotes an alphabet app that encourages children to attack the US, Britain, France, and Russia. The terror group is adept at using disinformation and propaganda to lure in recruits and spread its message.

ISIS photos via Rumiyyh magazine

Secret Wars

One of the defining aspects of hybrid war is deniability. This is especially true of hybrid war as it is practiced by Russia, whose actions are designed to sow confusion about who is responsible for what and where a conflict is headed.

Thus Moscow uses proxy soldiers and unmarked Special Forces, shadowy hacker groups and armies of internet trolls, and slow, almost inch by inch, increases in geopolitical pressure.

Without hard evidence of bad action, confrontations with other powers can remain at a simmer. Russian moves have proved effective, yet remain under the reaction threshold of the US and the rest of the West.

“Hybrid is about reduced warning time. It’s about deception. It’s about a mixture of military and non-military means,” said NATO Secretary General Jens Stoltenberg at the 2015 NATO Transformation Seminar.

Crimea and Ukraine may not be the only places where this Russian approach is evident. US and NATO officials worry that a hybrid war of sorts may already have begun elsewhere along NATO’s eastern flank.

For instance, Russian jets and submarines are now approaching the Baltic states of Latvia, Estonia, and Lithuania with a frequency not seen since the Cold War. Moscow recently publicized a move of short-range, nuclear-capable Iskander missiles into Kaliningrad, a Russian enclave between Poland and Lithuania on the Baltic Sea. And a 2016 Russian military exercise near the Latvian border featured Russian troops with loudspeakers calling on NATO soldiers to surrender.

Russian minorities in Estonia and Latvia could serve as a casus belli drawing Russia into the region. In 2007 Russian media falsely reported that in Estonia, Russian-speakers were being drugged and tortured by police. This sparked local riots.

Around the same time, cyber attacks linked to pro-Russian groups knocked some large Estonian networks off-line.

Worry about Russian provocations led NATO in July 2016 to request that member nations station troops in Latvia, Estonia, Lithuania, and Poland until at least March 2019.

The Baltic states and Poland are all NATO members in good standing. NATO’s leadership is concerned that Russia is attempting to create a “grey zone” of ambiguity along the alliance’s eastern flank to weaken the alliance’s solidarity.

“Attempts at domestic political and economic destabilization and manipulation of states along the eastern border regions of NATO from the Baltics to the Black Sea have driven many political leaders to claim that they fall within this grey zone already, and that it will only expand,” said a 2015 NATO report on hybrid warfare.

Under Article 5 of the NATO treaty an armed attack against any member state is an attack against all, requiring a collective response. This is where the deniability aspect of hybrid warfare may come into play. By using hidden tactics that target political, economic, and social vulnerabilities, Russia or any other adversary could creep toward its objectives without activating Article 5.

The West could become the proverbial frog in the soup pot, with the heat gradually increasing and the frog acclimating to the temperature until the water boils.

“Once a Crimea-style operation has begun, it will be extremely difficult if not impossible for Western decision-makers to be sufficiently confident about the other side’s intent to take consequential action before it’s too late,” according to Paul J. Sanders, executive director of the Center for the National Interest, and a former State Department official.

a concealed character”—might even exceed the power of actual weapons.

HIDDEN INTENTIONS

“The open use of forces—often under the guise of peacekeeping and crisis regulation—is resorted to only at a certain stage, primarily for the achievement of final success in the conflict,” the Russian military chief wrote.

Not all military analysts are fond of the hybrid war concept. Some find it too vague, changeable, a means of lumping variable actual conflicts together.

In 2010 the US Government Accountability Office surveyed officials from more than 20 US military organizations, from all services, and found they had no common definition of the term. Nor did they have plans to agree on one, since hybrid war is not an idea that has been officially incorporated into US doctrine.

Wire-guided portable anti-tank missiles discovered in a car in Southern Lebanon by Israel Defense Forces.

This may be part of hybrid warfare’s appeal to the world’s thugs, bullies, and terror mongers. It is difficult for Western powers to effectively respond to actions that can frequently be excused, explained away, or justified,

especially when there are no agreed-upon descriptions of what is going on.

Moreover, Gerasimov’s opinions on the subject have been a bit misread in the West, say some critics. While his predictions of future conflicts were similar



in some ways to those of the US and NATO, he put greater emphasis on heavy conventional capabilities, writes Charles K. Bartles, an analyst at the Foreign Military Studies Office at Fort Leavenworth, Kan., in a 2016 analysis.

“Gerasimov is simply explaining his view of the operational environment and the nature of future war, and not proposing a new Russian way of warfare or military doctrine,” Bartles writes.

Still, over the last decade the concept of hybrid warfare has spread widely among US analysts and NATO planners. To many it offers a means of making sense of militarily resurgent Russia’s moves around its perimeter and in Syria. It can explain some of the gains made by ISIS.

The 2014 US Quadrennial Defense Review cites a need for the Pentagon to rebalance to face a broad spectrum of threats, from high-end conflict to “hybrid contingencies.”

IS THIS WAR?

NATO worries that hybrid war can inch toward a geopolitical objective while remaining under the threshold for Article 5, which triggers collective armed defense of a threatened member.

Russia’s incursion in Crimea and Ukraine is a case in point. It was rooted in the Russian determination that blocking Ukraine’s further economic and political integration into Europe was a vital interest.

It began with misdirection. As protests roiled Ukraine in early 2014, Russia mounted a large military exercise within striking distance of the Ukraine border. This distracted the newly installed pro-Western government in Kiev, as the Russian force was big enough that the exercise was a plausible preinvasion movement.

Meanwhile, the little green men appeared, and Moscow began to close its grip on Ukraine’s Crimean Peninsula. After it became apparent what was happening, the nearby Russian force helped dissuade Kiev from mounting its own military move to try and forestall Crimea’s fall.

On March 1 President Vladimir Putin orchestrated a Russian referendum authorizing him to use force in Ukraine. Regular infantry units moved into Crimea, covered by airpower from the Russian Black Sea fleet.

Meanwhile, Russia successfully exploited the information dimension of the conflict, according to a 2015

NATO study of hybrid war incidents. It flooded local media with propaganda depicting Moscow as the protector of Russian-language residents of the region, who were depicted as threatened by potential atrocities.

This sort of propaganda has made Putin hugely popular in Russia and may have helped deter the West from a more muscular support of Ukraine.

Russia’s information efforts “served as a force multiplier in the conflict,” according to the NATO report.

Success for Russia is far from guaranteed in this effort, however. It did seize Crimea, but the nearby presence of Russian naval and air forces based there made that relatively easy.

The combination of little green men, local paramilitaries, propaganda, and advanced Russian weapons and technologies has thus far won Moscow only a foothold in mainland Ukraine. The incursion has pushed the current Ukraine government into making a priority of NATO membership.

“While Russia certainly used soft probing to seek its objective of bringing Ukraine back into its sphere of influence, it has clearly failed to do so as Kiev is now more firmly convinced of closer integration with the



Tactical air control party members at Fort Carson, Colo., train for helicopter extraction in November 2016. US and NATO forces must be prepared to address a full spectrum of hostile, hybrid actions.

USAF photo



Airmen at Homestead ARB, Fla., explore ways to prevent malware from reaching aircraft. The 482nd Communications Squadron integrates cyber operations into the wing's core mission. Electronic and cyber warfare will make future hybrid warfare conflicts even more challenging.

Euro-Atlantic community than ever,” states the NATO study.

NOT JUST STATE-ON-STATE

To the south, across the Black Sea, lies another den of the hybrid threat, as practiced by ISIS.

ISIS employs a wide range of military approaches, from terrorism to small unit insurgencies to conventional set-piece battles. Their technology ranges from crude improvised bombs to intricate improvised explosive devices, drones, and captured US weaponry.

Much of the organization's activity is financed by criminal activity. It kidnaps people for ransom, extorts business owners in occupied areas, and charges “tolls” at gunpoint on highways. Combined with income from oil production, the cash has made ISIS perhaps the richest non-national military in the world.

Meanwhile, the group's use of information war is unprecedented. That is particularly true of its ability to develop and disseminate propaganda films and images that spread the group's message and serve to draw in recruits.

President Obama himself had described ISIS as “a sort of hybrid.”

ISIS “has the ability to form, deploy, and sustain conventional forces and simultaneously maximize the use of irregular tactics, adapting the mix to exploit its opponent's weakness,” concludes NATO's hybrid threat study.

NO EASY ANSWERS

Defending against hybrid wars might be as complex as fighting them. It requires a number of different modes of operation, as Mattis and Hoffman noted a decade ago. There's heavy conventional fighting in one area, anti-insurgency patrols in another, and peacekeeping operations in a third. There's an information dimension to all these efforts.

That might be akin to fighting World War II on one block, Operation Iraqi Freedom on another, while overseeing the Marshall Plan on a third—and tweeting and Facebooking about it all with an electronic infrastructure armored against cyber retaliation.

According to NATO, a fitting motto for countering hybrid efforts might be “adopt, adapt, adept.” Western militaries may need to adopt new strategies while adapting structure and readiness to meet new challenges.

One of those new strategies might be increased support for weak or failing states. These crumbling edges are the battlegrounds for the hybrid wars of the future, pointed out USAF Lt. Col. Michael Miller in an Air War College report on preparation for hybrid conflicts.

Shoring up these vulnerable regions before they fall victim to opportunistic

aggressors might require intelligence collection to see what is going on, diplomacy to help reform governments and build international coalitions, and economic and military assistance.

A second pillar might be actions against a hybrid adversary should the first step not prevent conflict. This might depend crucially on intelligence about the actors involved, including their motives and goals; diplomacy to build international support for the objectives of the US and its allies; economic sanctions; and the exposure of state sponsorship of terrorist or revolutionary groups by information operations on a strategic scale.

Then there is pulling together a military force and operational plan to actually fight hybrid combat. Such a force needs to be flexible enough to fight conventional and unconventional threats at the same time.

“Conventional and unconventional military actions, such as targeting military supply routes and protecting the population, must occur at the same time. They will not occur in series—as is typical of traditional planning,” wrote Miller in his 2015 study.

Plus, the forces must be capable and leaders must be willing to use them under circumstances that are deliberately ambiguous.

The lesson of Israel's war with Hezbollah may be that complacency can be dangerous. The US may need to prepare for an adversary that is similar to the one faced in Afghanistan and Iraq—except with far more technical and operational sophistication.

“The potential combination of improvised explosive devices, electronic and cyber warfare, anti-armor weapons, long-range rockets, unmanned aerial vehicles, and sophisticated anti-aircraft weapons will make a future hybrid conflict extremely challenging,” stated Miller.

The combination has been used to great effect in Ukraine and Syria, and hybrid warfare will likely continue to be an attractive way to fight a low-level war until the West can demonstrate effective countermeasures. ✪

Peter Grier, a Washington, D.C., editor for the *Christian Science Monitor*, is a long-time contributor to *Air Force Magazine*. His most recent article, “These Magnificent Spies,” appeared in the October issue.



Pegasus Prep

By Brian W. Everstine, Pentagon Editor

A KC-46 refuels an A-10 in July 2016 on the last flight test required for the tanker's Milestone C low-rate production go-ahead.

The Air Force's KC-46 tanker program faces developmental and budgetary headwinds in the quest to bring aircraft into service.



The Air Force/Boeing KC-46 tanker program is focused on a singular goal in 2017: getting iron on the ramp.

After a 2016 marked by technical setbacks—forcing a boom redesign—and an intense test and evaluation schedule, the program is aimed at putting the first Pegasus in operational service by the end of the year.

As a program in development, the KC-46 has “had a few hiccups along the way,” Brig. Gen. Duke Z. Richardson, the Air Force program executive officer for tankers, said in a recent interview with *Air Force Magazine*. Broadly, though, “I see a very successful program. If it didn’t have hiccups, I’d be shocked,” he said.

Cumulatively, these problems have pushed delivery of the first lot of 18 KC-46s back from summer 2017 to February 2018, Richardson said. And delays on the fixed-price program have cost Boeing nearly \$2 billion in overruns. Given the technical advances the

KC-46 will deliver, compared to the existing fleet of KC-135s and KC-10s, however, the “hiccups” will have been worth it, Richardson said.

The program hit its major 2016 turning point last summer, when Frank Kendall III, the Pentagon’s head of acquisition, technology, and logistics, approved Milestone C, allowing the Pegasus to start low-rate production. This was immediately followed by contracts for the first two production lots: \$2.8 billion covering seven and 12 aircraft, respectively. The next lot contract was due to be inked in January, Richardson said.

By mid-December, there were five KC-46s flying. Technically, Boeing still “owns” them, Richardson said, having not “DD-250’d” the aircraft—the process of completing checks to pass them to the Air Force. USAF and Boeing crews have been putting the jets through their paces both at Seattle—near where Boeing manufactures them—and at Edwards AFB,

Calif. Development has been “cranking along,” Richardson said, and by early December testers had completed just over half the evaluation program.

“It’s great to get past the 50 percent mark,” Richardson said.

To reach Kendall’s Milestone C decision, the KC-46 had to successfully pass fuel to five different receiver aircraft. Those basic flights were conducted in good conditions, but now the KC-46 is really being challenged.

Aircrews are flying refueling missions in all sorts of flight conditions, pushing to “expand the envelope” of KC-46 operations, Richardson explained. The tanker is being flown at high speed with fast-movers such as F-16s, at different altitudes, and at low speed with aircraft such as A-10s. Operational testers must certify the KC-46 with eight different tanker receivers.

Testing isn’t just about refueling. For example, the KC-46 has a new radar warning receiver suite that allows it

USAF photo by A1C Jake Carter



USAF photo by Christopher Okula



to pinpoint threats instead of simply telling the crew a threat is out there, somewhere. That testing is underway “pretty heavily,” Richardson said.

FIXING THE BOOM

Before the aircraft could be cleared for production, a major issue had to be corrected with its new refueling boom, the flyable pipe that connects the KC-46 to receiver aircraft. The boom system on the KC-46 was adapted from the KC-10 Extender’s. It uses a fly-by-wire, telescoping boom with a hydraulic system to keep it steady during flight.

During a flight test with an F-16, the boom experienced “higher than expected axial loads,” the service said. The issue arose again during a test flight with a C-17. “The receiver aircraft was pushing on the boom” more than expected, Col. John Newberry, KC-46 system program manager, told *Air Force Magazine*.

The problem was worrisome enough that USAF delayed its Milestone C timeline and pressed for a fix.

Boeing engineers developed hydraulic relief valves for the boom. They were quickly fitted to a test aircraft. Initial flights in July 2016 showed that the fix worked, and the push for production approval was back on track.

Secretary of the Air Force Deborah Lee James commended the USAF/Boeing team for “diligently working through some difficult technical challenges,” after test flights with an F-16 and a C-17 proved the fix. “The KC-46 program has made significant strides in moving the Air Force toward the modernization needed in our strategic tanker fleet,” she said.

After the successful tests, Boeing “production-ized” the new design, Newberry said. Boeing is building the revised system into the rest of the test aircraft and those under production.

The developmental tweaks came at a cost, but not for the taxpayer. The contract is fixed price, with the Air

Force’s cost capped at \$4.9 billion. Any overruns must be borne by Boeing.

The overrun amount was about \$1.9 billion, the company said last July. This included some \$393 million for the boom fix.

In addition to getting the aircraft on the ramp, the Air Force is moving to get more airmen in Pegasus cockpits, maintenance hangars, and boom stations. As of December, the service had trained 29 pilots, 25 boom operators, and 13 maintainers for the KC-46, and that number “will ramp up” as the program moves forward and more aircraft are delivered, Newberry said.

Test flights out of Seattle are flown and supported by a mixed crew of Boeing employees and Air Force personnel.

BACK END TO THE FRONT

The KC-46 boom operator station is a major departure from the way this function has been performed in the past. Instead of “flying” the boom by sitting or lying at the back of the jet and watching the action directly through windows, KC-46 boom operators sit at a workstation behind the cockpit, using a 3-D camera system to direct the refueling operation. There’s an instructor station right next to the operator station, providing for better training and redundancy. Boeing is still fine-tuning the camera system’s software.

Despite the radical departure from the traditional layout and operation of the tanker station, Newberry said he’s not aware of it causing any training issues. “They are taking to it,” he said of the boom operators.

To go with a modern system, there’s a modern training apparatus. The KC-46 program includes full-motion aircrew simulators, along with an integrated maintenance training system, purchased in the July contracts.

Infrastructure to support KC-46 basing is coming along. Support equipment deliveries are underway at Altus AFB, Okla., and McConnell AFB, Kan. Military construction is on track to the point where it is “basically ready for the first airplane,” Richardson said. McConnell, the first operating location for the aircraft, will eventually host 36 KC-46s.

Altus is home to the 56th Air Refueling Squadron and will be the schoolhouse for KC-46 aircrews. The service

unveiled the formal training center at the base during an event last August, and the first aircraft is expected to arrive early this year.

USAF is still evaluating other operating sites. Pease Intl. Tradeport ANG, N.H., will host the first Air National Guard unit and Seymour Johnson AFB, N.C., will host the first Reserve unit. The Air Force announced Dover AFB, Del.; Fairchild AFB, Wash.; Grand Forks AFB, N.D.; Travis AFB, Calif.; and JB McGuire-Dix-Lakehurst, N.J., as candidates for the second Active Duty wing to host the aircraft starting in 2020.

Air Mobility Command is planning to rotate the aircraft among the bases, to extend their service lives, AMC Commander Gen. Carlton D. Everhart II said. The KC-46 deployment will follow a model used with C-17s. They rotate through bases depending on their utilization rates and environmental conditions.

If aircraft are being underused, they’ll be sent to busier bases, and vice versa, so the fleet will age at a relatively even rate and avoid excessive strain on any group of airframes.

Aircraft based near humid, salty conditions will rotate to regions that are dry to even out the effect of environmental issues such as corrosion, Everhart said in September. This management technique could extend the lifespan of C-17s by 10 to 20 years, he said.

The budget uncertainty coming out of Washington, D.C., threatened the KC-46 program. Congress in December passed a long-term continuing resolution to fund the government, a move Air Force and Pentagon leadership had repeatedly asked lawmakers to avoid.

A continuing resolution, James had warned, would limit production to Fiscal 2016 levels of just 12 aircraft, a move that would have required renegotiating the contract with Boeing. The contract called for 15 aircraft in Fiscal 2017, and buying fewer tankers would have caused the Pentagon to pay a penalty to the contractor.

Defense Secretary Ashton B. Carter specifically asked lawmakers to avoid this penalty, and legislation authorizing the 15 aircraft made it into the final bill language.

Even at that rate, however, it will be a long road to deliver the 179 planned

Top left: TSgt. Chris Joyce works the boom on a KC-135 during a Red Flag training mission. He was selected to become a boom operator on the new Pegasus. Left: A KC-46 runs receiver compatibility tests with a C-17 during the late stages of the Milestone C testing.



USAF photo by A1C Jenna K. Caldwell

Above left: MSgt. Luis Rodriguez-Asad uses the KC-46 boom operator demonstrator at McConnell AFB, Kan., to get a taste of what refueling on the new tanker might be like. Above: The newly unveiled "Pegasus Country" emblem on display at Pease ANG, N.H. Left: Contractors perform a fire suppression foam test in a hangar at McConnell AFB, Kan. The new hangars will house the KC-46s, scheduled to arrive in early 2017.

The command is making a "capabilities-based assessment" to identify what gaps are ahead and set a formal requirements document. Once those requirements are identified, that's when the acquisition community gets to work, Richardson said.

Everhart is on record saying he thinks the KC-46 is a good product and probably should be continued beyond the planned 179 aircraft. The long-standing tanker plan has been to modernize the tanker fleet in three tranches: KC-X (now called the KC-46A), the KC-Y, expected to finish replacing the KC-135 fleet, and the KC-Z, targeted at replacing the KC-10. But Everhart thinks it might be better to simply buy the KC-46 as the KC-Y iteration as well, and move on to a futuristic design for the KC-Z.

Speaking at a National Defense Transportation Association meeting in St. Louis in early November, Everhart avoided specifics for what this technology could be, saying only that he seeks a significant advancement.

"I want to be able to leap to technology 20 years down the road, and I actually want to go straight to the Z," Everhart said. "That's where I want to head as long as our budgets allow us to be able to do so." ★

aircraft. "It will take a good 30 years to replace the fleet at that rate," Richardson said.

The Air Force's tanker requirement is actually 479 aircraft. To keep the remaining KC-135s and KC-10s healthy, Richardson has a "robust integrity program" to monitor its legacy tankers and track their airworthiness, he said, because "we always fly safe aircraft."

Evidence of this is seen in how the Air Force sustains these tankers.

The KC-10 is going through a program to update its avionics equipment to meet Communication, Navigation, Surveillance/Air Traffic Management international mandates. The fleet was facing flight restrictions because of its outdated equipment, and the new

program ensures it will have complete, unrestricted access to worldwide airspace.

The KC-135, among the service's oldest at an average age of more than 55 years, is undergoing the Block 45 cockpit refresh. The program includes upgraded autopilot systems and digital screens that replace analog gauges. Air Force officials expect updates could help the Stratotankers fly until 2040, almost 85 years since the first KC-135A's inaugural flight.

THE NEXT, NEXT GENERATION

The service's massive need for tankers in the future means the 179 KC-46s won't be enough. Air Mobility Command needs to prepare now for whatever comes next.



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A C-17 is prepared for takeoff during a training exercise. Inventing technologies at a fixed price—as was done for C-17s in the 1980s—was disastrous.



Heaping Change Upon Improvement

By John A. Tirpak, Editorial Director



DOD photo by Glenn Fawcett



Despite the Pentagon's recent success at improving its acquisition systems, Congress is imposing major changes.

A year from now, the top acquisition job in the Pentagon will split in two under a major reorganization imposed by Congress, even though there's been tremendous progress in getting program costs and schedules under control in recent years.

The 2017 National Defense Authorization Act, which became law in

December, calls for the abolition of the No. 3 job at the Defense Department. The post of undersecretary of defense (USD) for acquisition, technology, and logistics, or AT&L, will disappear in February 2018. It is to be replaced by two positions: undersecretary for research and engineering (R&E), and undersecretary for acquisition and sustainment (A&D).

from a wide array of existing contracting methods to get the best deal on a given project, or innovate a new one if it seemed best. They were to take a sensible approach to risk, reducing it wherever possible, get the best price—preferably through competition—and get the materiel into the hands of the users as quickly as they reasonably could. Kendall met frequently with the press to discuss reform progress and adjustments to the system.

A 30-YEAR LOW

Late last year, Kendall called the press in for what turned out to be one last wrap-up of acquisition improvements, offering up what he judged to be impressive results. With hundreds of pages of data culled from 19 years of case histories to back up the claim, he said that acquisition costs on major programs were headed down, that “six years of work” had paid off with cost growth at a 30-year low.

“We reversed a trend that was in the opposite direction,” he asserted. “That’s a pretty big deal.”

Given the numbers, Kendall said, “abolishing my position ... is probably a bad decision.” He said his post has been successful at both managing acquisition and improving it in small steps rather than radical and disruptive broad overhauls. Moreover, he argued that the Secretary of Defense “needs someone ... who can effectively oversee service acquisition programs for him.” Kendall, patting the 223-page report, told reporters that previous efforts at acquisition reform were “intuitive, not driven by data,” and the numbers on the whole speak for themselves.

Case in point: Nunn-McCurdy breaches—programs that suddenly report an egregious 25 percent spike in costs—or a schedule delay of 20 percent are down. There were seven Nunn-McCurdy breaches in 2009; there was one in 2016.

Kendall dryly observed that the biggest cause of such schedule delays is Congress.

Much of the challenge, he said, lies more in quickly obtaining funding to begin acquisition than a magical shortcut to developing and fielding systems. Kendall argued routinely and vigorously for repeal of the Budget



US Navy photo by Aaron Lebsack



Lockheed Martin photo

Kendall (c) takes a briefing from Jose Romero-Mariona on cybersecurity at the Space and Naval Warfare Systems Center Pacific.

Congress left it up to the Pentagon itself to spend that year sorting out how best to organize the various positions that will report to the two undersecretaries. But it also included language allowing the Trump Administration to implement the change immediately if it so chooses.

The existing AT&L position has been held by Frank Kendall since 2012 and, before him, by Ashton B. Carter, who became President Obama’s final Defense Secretary. Carter started a reform of the acquisition system called Better Buying Power, and Kendall ran with it when Carter became the No. 2 at DOD. Through several iterations, BBP aimed at applying more common sense to the Pentagon’s buying system, specifically proscribing “one size fits all” approaches to buying complex weapons systems and simple staples alike.

Kendall—who evolved BBP constantly, even though he held it out as a kind of new bible of purchasing—instructed acquisition officers to choose

Left: Deputy Defense Secretary Robert Work (l) and DOD acquisition chief Frank Kendall brief the media at a press conference in 2015. Above: An F-35 is readied for roll out at the Lockheed Martin factory in Fort Worth, Texas. Better Buying Power initiatives helped the strike fighter program turn the corner.



USAF photo by A1C Thomas T. Charlton



US Navy photo courtesy of Huntington Ingalls Industries, Inc.



USAF photo by Scott M. Ash

Control Act that imposed unreasonable and unthinking automatic cuts on the Pentagon when Congress couldn't agree on a budget. He complained that he spent much of his time working around those roadblocks, calling them dangerous and arbitrary.

Kendall was keenly aware at the time that congressional members and staffers were cooking up a restructuring of his office, and he had come out against proposals contained in earlier drafts of the legislation. In those previous iterations, the new A&D job was cast as the undersecretary for "management and support."

Members of Congress—particularly Sen. John McCain (R-Ariz.), head of the Armed Services Committee—had tussled with Kendall, saying that the situation was not all roses. Critics pointed to the failure of the Army's Future Combat System (FCS) and huge overruns on USS *Gerald R. Ford* aircraft carrier, Space Based Infrared System satellite constellation, and the F-35 fighter as examples of acquisition being "out of control," a phrase newly elected President Trump borrowed in a December tweet complaining about the F-35.

Kendall, in annual testimony about acquisition reform, would respond that the FCS and F-35, for example, were in trouble before BBP initiatives took hold, and that the F-35 had turned the corner.

The contracting disasters of the 1990s have largely been laid at the feet of another contracting fad, Total System Performance Responsibility (TSPR), that left contractors largely in the role

of policing themselves; and while the companies were supposed to be paid based on outcomes, TSPR wound up paying by calendar milestones. Thousands of Pentagon in-house contracting specialists and program management experts—including uniformed experts in the various services—were pushed out of those jobs, with a huge brain drain resulting. Kendall said he has labored to rebuild the acquisition workforce, and this has helped turn around programs in trouble.

IMPORTANCE OF SHARED RISK

Still, McCain insisted that contractors were not being held to account on major programs. He wanted most, if not all, programs—such as the new B-21 bomber—to be contracted at a fixed price, with the contractor eating any overages.

Kendall countered that inventing technology on a fixed price—another contracting fad, this one in vogue in 1980s—had proved disastrous on the C-17 transport and A-12 attack plane, as just two examples. Kendall argued that this is not a good idea and that new programs, because of their uncertainty, should instead be structured with some shared risk and incentives that reward success. Risk is further reduced by ensuring the government owns the technical data, so future upgrades can be put out for competition—instead of the original contractor having an inside track on all future related work.

Congress hasn't said exactly what the problem is at DOD that it's trying to fix, but it appears to be a nebulous

conglomeration of inefficiency, cost-growth, and schedule delays. Senate staffers have said they are trying to help the department by establishing a high-ranking "chief technology officer."

They want someone whose sole focus will be shepherding promising technologies into production at an unprecedented speed. It's a reaction, they said, to Deputy Defense Secretary Robert O. Work's Third Offset idea that the Pentagon is going to have to be more agile in staying ahead of competitors like China and Russia, whose technical capabilities are growing by the day. It's a mistake to weigh down a single individual with responsibility for science and technology, research and development, and acquisition and sustainment, they said. While R&D has to be about innovation and risky gambles, acquisition should be about getting good deals, the staffers argued.

Kendall has countered that it makes infinite sense to keep all those functions



Above left: SSgt. Jeffrey Michal (l) and MSgt. Gregory Long, both loadmasters, look out the back of a C-17. Above: The flight deck of USS *Gerald R. Ford* is completed at Newport News, Va. The aircraft carrier was beset with huge cost overruns. Left: Secretary of the Air Force Deborah Lee James and USAF Chief of Staff Gen. Mark Welsh III testify before the House Armed Services Committee in 2016.

together, so that the ultimate care and feeding of a system is taken into account at its inception, to avoid mistakes that are costly to fix later. Although development costs garner the lion's share of congressional and press attention, the bulk of a system's cost is actually in its use and sustainment.

In a May article commenting on his efforts at reforming acquisition, Kendall noted the "limitations of legislative tools" in this regard, arguing that "lasting improvements must come from within" the Defense Department. He said success really boils down to four things: setting reasonable requirements, putting professionals in charge, giving them the resources they need, and providing strong incentives for success. He said the trick is finding the right "nuance" in each step.

"None of this is easy," Kendall wrote.

The ultimate outcome of the National Defense Authorization Act (NDAA) language put many of Kendall's fears to rest, however. The post of USD for acquisition and sustainment will keep those functions together—what the Air Force has called "cradle to grave" management. Meanwhile, the other post, R&E, will concentrate on basic science and technology (S&T).

At a conference in December, shortly after the NDAA was approved, Kendall said he wanted to keep the "three major phases of a life cycle"—development, production, and sustainment—together under a single overseer, and the final NDAA language does that. The R&E job will have oversight of S&T, the laboratory system, and prototyping, and he said he's "fine with that."

What's unclear is who will actually have decision authority over milestones and perform functions such as certifying program costs, he said. Some of the NDAA reporting thresholds are fairly low dollar amounts, by Pentagon standards—\$25 million, in some cases—and those decisions may be escalated up to the deputy secretary or even Secretary level, imposing a burden that should rightfully be driven down to lower levels.

of working in defense acquisition, "it has become clear to me that there is no 'acquisition magic'—no easy solution or set of solutions that will miraculously change our results." Most attempts at quick fixes "have been counterproductive and often only increased the system's bureaucracy and rigidity."

While he pointed out that programs are doing much better, Kendall acknowledged two items of concern among the data. One, competition is down—symptomatic of industrial vertical integration, industry consolidation, low budgets, and an often too-challenging bar for new entrants in the business.

With limited funds, it's not always possible to pay double in development—for a second prototype or source—and production probably won't justify a second manufacturer,

Evolution of the Pentagon's Top Acquisition Job

- 1977:** Undersecretary of Defense for Research and Engineering
- 1986:** Undersecretary of Defense for Acquisition
- 1993:** Undersecretary of Defense for Acquisition and Technology
- 1999:** Undersecretary of Defense for Acquisition, Technology, and Logistics
- 2017:** (Pending) Undersecretary of Defense for Research and Engineering
(and)
Undersecretary of Defense for Acquisition and Sustainment

Still, Capitol Hill staffers argue that they are trying to make the Pentagon work more like a business. Most companies don't put their heads of procurement in charge of research and development as well, said one. The change will make it easier for the Pentagon acquisition leadership to "better interface" with contractors since they'll be talking "apples to apples," he said.

Kendall oversaw a tremendous bureaucracy with offices specializing in everything from combat aircraft to unmanned submarines to industrial policy. How those get divvied up between the two new undersecretaries will take time to figure out. Even then, given the remarkable overlap of some areas, turf wars are to be expected. In fact, to free up the two principal USDs to concentrate on the big stuff, legislators may, in the year to come, also have to shape a new organization and add some new positions—or even a third undersecretariat—to manage the various subdepartments.

Concluding the forward to his 2016 report, Kendall wrote that in his years

he said. The F-35 was an example of putting simply too many eggs in one basket, he observed. DOD should not "put so much capability in the hands of one prime contractor."

Second, there aren't as many programs as there used to be or ought to be. Given the rapid technological progress of threat nations and nonstate actors, "I don't think we're putting as many new products into the new product pipeline as we should," he said.

Senate staffers said putting the third-ranked Pentagon official in charge of rapid prototyping should give experimentation the attention and emphasis it deserves. Work has said experimentation has to become the state of mind in the Pentagon, and that if a defense organization is doing something the same way for more than a few years in a row, that way of doing things probably needs to change. Time—and the data—will tell if the changes to defense acquisition prove to be a help or hindrance. ★

The US has been fighting ISIS for two years without explicit authority from Congress. That's perfectly normal.



UNDECLARED WAR

By Jennifer Hlad



Above: An F-15 drops a bomb aimed at an ISIS headquarters target in Iraq on Sept. 12. Here: A bomb dropped during that September mission destroys an ISIS headquarters and chemical weapons facility.

Images from USAF video by TSgt. Jeremy Roman



Since August 2014, the US has been at war with ISIS forces in Syria and Iraq, bombing fixed targets and providing close air support for Iraqi army troops and Kurdish Peshmerga fighters. But while Congress has provided funds to carry out this air campaign, it has—so far—not explicitly authorized this particular action as a “war,” and will probably never get around to it.

In fact, though the US has been involved in many armed conflicts over the last seven decades, the last time Congress actually declared war was some 75 years ago, after the Japanese attack on Pearl Harbor. Since then, the US has gone to war largely at the behest of the President, with Congress supplying some covering legislation after the fact, such as the Gulf of Tonkin Resolution that underpinned the Vietnam War.

The authorizing history for the current fight goes back 15 years.

■ On Sept. 14, 2001, Congress passed a joint resolution to authorize the use of military force “against those responsible for the recent attacks launched against the United States.” This was a response to the 9/11 attacks.

■ President George W. Bush signed the legislation on Sept. 18, 2001, and the Authorization for Use of Military Force, or AUMF, became law. Less than three weeks later, on Oct. 7, the US launched Operation Enduring Freedom in Afghanistan.

■ In October 2002, another AUMF—authorizing the use of force in Iraq—was

approved by Congress and became law; Operation Iraqi Freedom began about five months later, in March 2003.

■ On Aug. 7, 2014, President Barack Obama authorized the first air strikes against ISIS, beginning the campaign now known as Operation Inherent Resolve.

THE SCOPE OF AN AUMF

Instead of pushing for a new AUMF, though, the Obama administration argued in September 2014 that the actions against ISIS are covered by the 2001 legislation.

“I have the authority to address the threat” from ISIS, Obama said Sept. 10, 2014, announcing the creation of a “broad coalition” against the terrorist group. “But I believe we are strongest as a nation when the President and Congress work together. So I welcome congressional support for this effort.”

More than two years since that speech, the fight against ISIS has only intensified. Yet despite support from lawmakers on both sides of the aisle, there is still no AUMF specifically for OIR—and there may never be.

The 2001 AUMF states that the President “is authorized to use all necessary and appropriate force against those nations, organizations, or persons he determines planned, authorized, committed, or aided the terrorist attacks that occurred on Sept. 11, 2001, or harbored such organizations or persons, in order to prevent any future acts of international terrorism against the United States by such nations, organizations, or persons.”

Stephen W. Preston, general counsel for the Department of Defense, has argued that ISIS is covered by the authorization because it is associated with al Qaeda. In a 2015 address to the American Society of International Law, he said that while “the name may have changed,” the group now known as ISIS or ISIL “has been an enemy of the United States within the scope of the 2001 AUMF since at least 2004.”

He explained, “A power struggle may have broken out within [Osama] bin Laden’s jihadist movement, but this same enemy of the United States continues to plot and carry out violent attacks against us to this day.”

Preston noted that while the 2002 AUMF allowed the use of force in Iraq based on the threat of Saddam Hussein’s regime, it “has always been understood to authorize the use of force for the related purposes of helping to establish a stable, democratic Iraq and addressing the terrorist threats emanating from Iraq” and therefore authorizes military operations against ISIS in Iraq.

Michael E. O’Hanlon, a senior fellow in foreign policy at the Brookings Institution, told *Air Force Magazine* he believes using the 2001 war powers authorization for the current fight is legal because, “while its name and leadership have changed multiple times—and while ISIS is now in fact in direct competition with another al Qaeda derivative in Syria—both those groups have common origins, ideology, and to some extent, membership with



Maintainers ready an F-15E for the mission against ISIS targets on Sept. 12, 2016. US assets including A-10s, F-15Es, F-16s, F/A-18s, and B-52s participated in the strike package.

the original al Qaeda organization that carried out the 9/11 attacks.”

Sen. Tim Kaine (D-Va.), the 2016 Democratic nominee for vice president, disagreed.

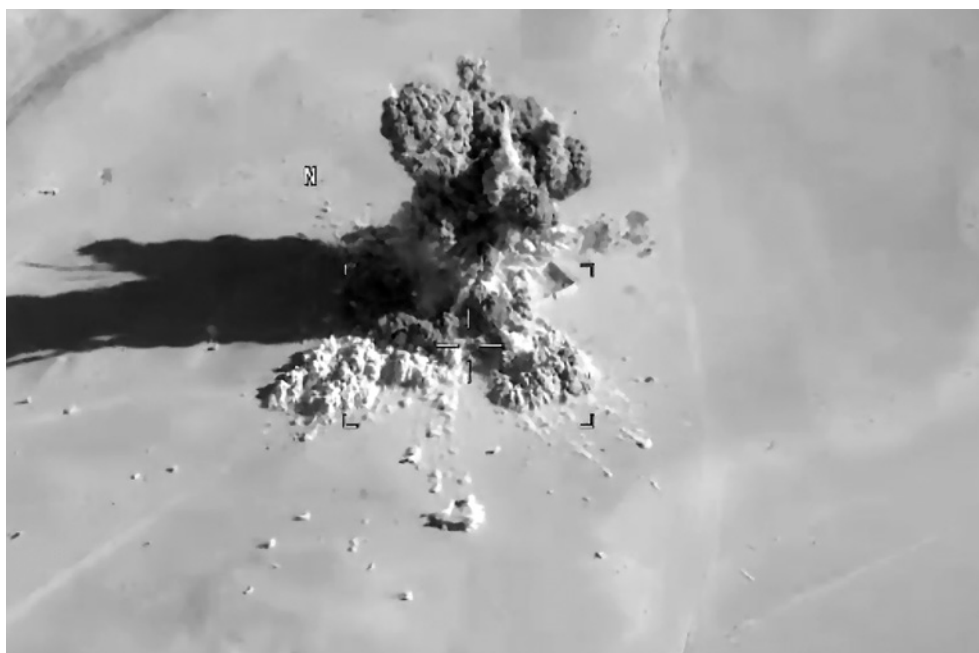
At an April 28, 2016, Senate Armed Services Committee hearing, Kaine said he is “in a minority in this body in Congress in believing that the 2001 authorization does not provide a legal justification for this war. And I think that there isn’t a domestic legal justification unless and until we” so vote.

Then-Defense Secretary Ashton B. Carter responded that while he agrees with Kaine that a new AUMF would “signify to the troops that the country is behind them,” he believes the 2001 law for OIR is, in fact, legal.

“I am told by the lawyers, and I believe this, that the legal basis ... exists in both domestic law and international law for everything we’re doing,” he said, adding that he’s not a lawyer and couldn’t explain the particulars.

The issue has been raised by Army Capt. Nathan Michael Smith, who in May sued Obama.

In the lawsuit, Smith wrote that he brought the legal action to ask the court “to tell the President that he must get proper authority from Congress, under the War Powers Resolution, to wage the war against ISIS in Iraq and Syria.”



USAF video image

The lawsuit was dismissed by a federal district court judge in November, however.

“This case raises questions that are committed to the political branches of government,” Judge Colleen Kollar-Kotelly wrote, according to a copy of the decision obtained by *The New York Times*. “The court is not well-equipped to resolve these questions, and the political branches [that] are so equipped do not appear to be in dispute as to their answers.”

The debate about how much power the President has over the use of military forces goes all the way back to the constitutional convention in 1787, explained retired Army Maj. Gen. John D. Altenburg, who served as deputy judge advocate general of the Army and is now a principal with the D.C. office of the Greenberg Traurig law firm. Altenburg is also a law lecturer at the George Washington University Law School.

The clause originally read “make war,” and they specifically edited it and changed

and Italy). However, since the 1790s, Congress has passed statutory provisions authorizing the President to use military force in locations around the world. The Vietnam War and the Korean War were never “declared,” for instance.

ROOM FOR DEBATE

In 1973, Congress overruled a presidential veto to pass the War Powers Resolution, in hopes of ensuring that the “collective judgment of both the Congress and the President will apply to the introduction of United States armed forces into hostilities.”

Beyond explicit congressional authorization, there is an argument that if Congress has appropriated funds for a military operation, that provides enough authority for the President to continue using military force, Altenburg said.

“Congress can, in one vote, stop the funding,” he said.

use of military force to degrade and defeat ISIL.”

In a letter to Congress about the proposal, he stated that it would not authorize “long-term, large-scale ground combat operations” like the wars in Iraq and Afghanistan. Instead, it would “provide the flexibility to conduct ground operations in other, more limited circumstances, such as rescue operations involving US or coalition personnel.”

The draft included a suggested endpoint—three years after the date of enactment—and would repeal the 2002 Authorization for Use of Military Force against Iraq. However, it did not address the 2001 authorization, though Obama in the letter to Congress said he was committed to refining it.

“Enacting an AUMF that is specific to the threat posed by ISIL could serve as a model for how we can work together to tailor the authorities granted by the 2001 AUMF,” he wrote.

The proposal stalled in Congress, as Republican lawmakers argued for a less limited AUMF.

Then-House Speaker John A. Boehner (R-Ohio) said in a statement that “any authorization for the use of military force must give our military commanders the flexibility and authorities they need to succeed and protect our people. ... I have concerns that the President’s request does not meet this standard.”

Sen. John McCain (R-Ariz.), chairman of the Senate Armed Services Committee, said he was “pleased” that Obama had proposed an AUMF, but McCain confessed to “deep concerns” about aspects of the proposal, “including limitations placed on the constitutional authority of the Commander in Chief, the failure to articulate an objective for the use of military force, and a narrow definition of strategy.”

Other initiatives for a new AUMF—including versions sponsored by Sen. Lindsey O. Graham (R-S.C.), Rep. Adam B. Schiff (D-Calif.), Rep. Adam D. Kinzinger (R-Ill.), Sen. Robert Menendez (D-N.J.), and Kaine—have also failed to advance.

O’Hanlon said the problem is that “everyone wants to use the new legislation for their own, often conflicting, purposes. Hawks want to revalidate the war effort, doves want to curtail it in time or place or means. Thus, a new majority fails to emerge on any specific proposal.”



Above left: In an Air Force video, an F-15E backseater checks the area of operations during a mission. Left: USAF forces destroyed an ISIS training camp (shown here in a screenshot from a USAF video) near Raqqah, Syria, Nov. 19. Above: F-15s fly in formation. The Sept. 12 strike mission included four F-15s.

As for the question of whether a new AUMF is necessary, Altenburg said there is “room to debate on both sides, but there is room to say that the 2001 and 2002 authorizations for the use of force are adequate for ... conducting operations against al Qaeda, ISIS, and similar organizations.”

Even though Obama and administration officials said they didn’t need a new AUMF to pursue the fight against ISIS, Obama nevertheless sought one.

He called on Congress to pass a new AUMF in his January 2015 State of the Union speech, and in February of that year, he submitted a draft AUMF that he said would “authorize the continued

it to ‘declare war,’ the implication being, it’s the executive that actually makes war and conducts tactics and strategy and the like, but Congress is the only one that can declare war,” Altenburg told *Air Force Magazine*.

Since that time, there have been just 11 declarations of war for five wars from the War of 1812 through World War II (when the US declared war on Germany, Japan,



Image from USAF Central Command video

Left: An F-16 pilot signals to another aircraft during an Operation Inherent Resolve mission. The OIR air component comprises some 20 nations. Below: SSgt. Trevor Lowder, a contingency response group airman, on the flight line at Qayyarah West Airfield, Iraq, in November. CRGs rapidly deploy personnel to establish, expand, sustain, and coordinate air mobility operations at austere bases.

they don't like the one that the President has sent them, there's nothing wrong with that; they can turn around and pass an AUMF that they believe in their heart is the right sort of thing to do and show the unity of the Congress."

USAF photo by SrA. Jordan Castelan



Altenburg agreed. "The difficulty in drafting another AUMF is, will there be an even bigger argument about how it would be restricted?" Altenburg asked. "We'll be in a debate that never ends" about what it should look like, he asserted.

So why pursue a new AUMF in the first place?

Preston, in his speech to the international-law society, said the most obvious reason the President would seek a new AUMF is that "the world needs to know we are united behind the effort against ISIL, and the men and women of our military deserve clear and unified support."

HERE'S TO A NEW AUMF

Chairman of the Joint Chiefs of Staff Marine Corps Gen. Joseph F. Dunford Jr. told the House Armed Services Committee in December 2015 that he "absolutely" believes "that a clear and unequivocal statement of support for the men and

women [who] are prosecuting the campaign and our allies from their elected officials" would be helpful.

O'Hanlon said a new AUMF could offer "greater precision and specificity."

It could "clarify that, for example, we shouldn't be using substantial numbers of US forces to attack Boko Haram, or a Salafist organization besides ISIS and al Nusra/Conquest Front in Syria, or another offshoot of the original movement that is too far away in location or too different in membership [or] leadership for the same single AUMF to cover that, too."

Retired Marine Corps Gen. James N. Mattis, the former head of US Central Command and nominee for Defense Secretary, in April 2016 told a group at the Center for Strategic and International Studies that an AUMF for the fight against ISIS "would again demonstrate American stability and focus on the region."

Referencing Congress' apparent inability to pass a new AUMF, he said: "If

Instead, he said, "they appear to be more willing to sit outside and criticize the President than to put themselves on the line and say, 'Here's where we stand.'"

Still, Obama seemed undeterred by the congressional inaction. In his January 2016 State of the Union address, he urged Congress to "take a vote" if members were "serious about winning this war." By late November, the administration was planning to expand the reach of the 2001 AUMF to include al Shabab in Somalia, according to *The New York Times*.

Lisa O. Monaco, Obama's top counterterrorism advisor, said in a statement that the terrorist threat "is constantly evolving and requires an adaptable response," the *Times* reported. ★

Jennifer Hlad is a freelance journalist based in the Middle East. Her most recent article for *Air Force Magazine* was "Separation Anxiety" in the February issue.



CORPORATE MEMBER SPOTLIGHT



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A CENTURY OF ACTION

An aerial photograph of two A-10 Thunderbolt II aircraft flying in formation over a landscape. The lead aircraft is in the foreground, viewed from a high angle, showing its four engines and the number 10998 on its nose. A second aircraft is visible below and behind it. The terrain below is a mix of green fields and brownish land, with some roads and structures visible.

Photography by Rick Llinares

Text by Wilson Brissett, Senior Editor

Selfridge Air National Guard Base, north of Detroit, marks 100 years of operation this summer.

Selfridge Air National Guard Base's history runs contiguous with the history of human flight. The installation's namesake, 1st Lt. Thomas E. Selfridge, was the first military casualty of flight. In September 1908, he died when the plane he was in—piloted by none other than Orville Wright—crashed at Fort Myer, Va.

Selfridge ANGB has trained or fielded pilots for every major US conflict since World War I, and this summer it will celebrate its centennial with an open house featuring the USAF Thunderbirds air demonstration squadron.

Selfridge's host unit, the 127th Wing, is no show pony and is fully engaged in today's missions. The wing is home to A-10s of the 107th Fighter Squadron, the "Red Devils," and KC-135s belonging to the 171st Air Refueling Squadron, the "Michigan Six-Pack." They anchor more than 40 tenant units, from every US service, on the base's 3,000-plus acres.

Since the 107th FS started flying A-10s in 2009, Selfridge's airmen have supported several major deployments, such as to Afghanistan in 2011-12 and to Southwest Asia for Operation Inherent Resolve in 2015.



Four A-10C aircraft and a KC-135R fly in formation from Selfridge ANGB, Mich.



1

The 2015 deployment involved 350 airmen supporting the A-10s, including a healthy maintenance contingent, and some 200 KC-135 personnel. By the end of that deployment, the Red Devils had flown 1,600 sorties and logged 11,000 combat flight hours. Other Selfridge airmen flew three of the most heavily used KC-135s in the Air Force at the time, chalking up some 300 missions and 2,200 combat flight hours. The six-month stretch was the longest mass deployment of Selfridge airmen since the Korean War, according to wing officials.

As 2016 ended, approximately 100 airmen from the 127th Wing were on duty in the US Central Command region for Operation Freedom's Sentinel and other contingencies. The deployed airmen were from the 127th Air Refueling Group, encompassing both the 171st Air Refueling Squadron and 191st Maintenance Squadron for KC-135 operations.

"In the past year, airmen from the group have performed short-term deployments in the European, Pacific, and Central Command areas of operations," read a Selfridge news release.

Clearly, Selfridge is no stranger to a high operating tempo. Sustaining these operations has been "an all hands on deck effort," said TSgt. Daniel Heaton, 127th Wing public affairs officer. But it hasn't stopped Selfridge's airmen from taking on additional missions. Beginning in January 2016, the base became a staging ground for the Federal Emergency Management Agency's response to the Flint, Mich., water crisis. The wing set up a FEMA storage and distribution depot, supply-

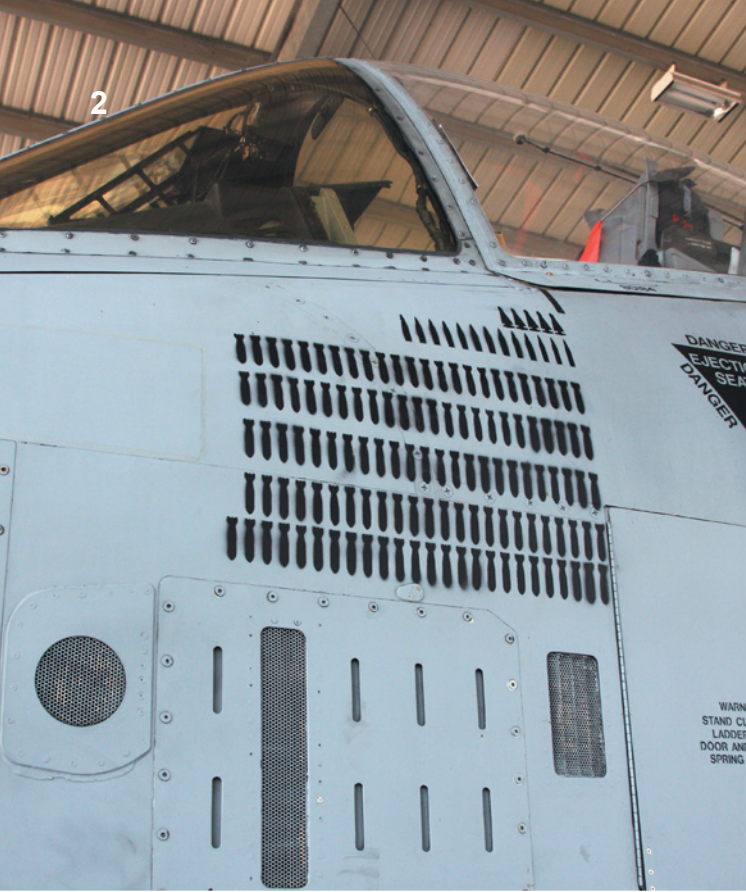


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/1/ An A-10 rolls away while deploying flares from dispensers underneath the fuselage. /2/ Markings indicating OIR missions are displayed on a fuselage of an A-10. /3/ Maj. John Rubin in the cockpit of his Warthog. /4/ SrA. Brandie Nosakowski works on a boom unit on a KC-135 tanker. /5/ SSgt. Joseph Shonk chooses a tool needed during a preflight routine on an A-10. /6/ A KC-135 on the runway. /7/ Four A-10s maintain a tight formation.



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ing nearly three million liters of bottled water to residents of Flint, which is 70 miles from Selfridge.

The FEMA mission illustrates how Selfridge sees itself as “Michigan’s hometown Air Force,” Heaton said. “We try to lift the bar a little higher.”

The hard work in both international combat operations and the local humanitarian missions has been recognized: In 2016, the wing received an Air Force Meritorious Unit Award for superior performance during its 2015 combat deployments.

Preparations for the 2017 centennial celebration, Aug. 19-20, are in full swing. In addition to the Thunderbirds, the wing is planning a display of historical aircraft from past missions. It’s even trying to find a JN-4 Jenny, the first aircraft assigned to Selfridge Field, where pilot training began in July 1917.

The celebration will be forward looking, though, and Selfridge’s immediate future looks exciting.

In December, the Air Force named the base as one of five finalists for the location of one of the new F-35A Lightning II ANG squadrons. There will be two Guard F-35 squadron locations.

/1/ A 30 mm GAU-8/A seven-barrel Gatling gun mounted on an A-10 at Selfridge. /2/ Rubin and Shonk preflight an A-10. /3/ A Warthog trailed by a Stratotanker. /4/ TSgt. Shaun Hover shows the marshalling signal for stop. /5/ A tanker on the ramp at Selfridge. /6/ SrA. Robert Akers, a boom operator, secures an exit door on a KC-135 before a mission. /7/ SSgt. Garrett Pillow (l) and SrA. Adam McMann (r) inspect survival kits carried by A-10 aircrews. /8/ The 127th Wing’s 107th Fighter Squadron is nicknamed “Red Devils.”



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ANG photo



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Brig. Gen. John D. Slocum, 127th Wing commander, thinks the new mission is a logical next step.

"The F-35 is a natural fit at Selfridge," he said. "Fighter aircraft have been operating at Selfridge for 100 years. We believe an enduring fighter mission makes sense. . . . The Michigan National Guard operates two world-class training facilities in northern Michigan, just a 30-minute flight from here."

Slocum said the cross-service relationships Selfridge maintains offer a unique opportunity to deploy the strike fighter "to work closely with the Army, Marine Corps, and some of our allied partners in a joint environment."

The final F-35 decision should be made sometime in 2017, and if selected, Selfridge would begin receiving the fifth generation fighters in the mid-2020s.

An F-35 squadron at Selfridge would put the Air Force's newest fighter at the same base where 2nd Lt. Curtis E. LeMay, future head of Strategic Air Command and USAF Chief of Staff, flew in his first Air Corps assignment nearly 90 years ago—in pursuit planes, of course. ✪

/1/ Airmen work on an A-10. The equipment in the foreground loads and unloads rounds for the Gatling gun. **/2/** SSgt. Logan Lyon (l) and Nosakowski perform maintenance on a KC-135 boom. **/3/** An A-10 maneuvers beneath a refueler. **/4/** L-r: Rubin, 1st Lt. Chris Ellsworth, SrA. Jordynn Horner, and Capt. Jason Holm at the front desk for wing operations. **/5/** Ellsworth and Rubin head out to their aircraft. **/6/** MSgt. Rich Gibbs places unit markings on a KC-135. **/7/** SSgt. Kenneth Stokely conducts preflight operations. **/8/** SrA. Scott Lange and other wing members helped the citizens of Flint, Mich., during their water crisis in 2016.

A Navy F/A-18 Super Hornet takes on fuel from a USAF KC-135 over Iraq on Sept. 28 during a mission for Operation Inherent Resolve.

The Joint Requirements Oversight Council makes the tough decisions on what's needed and what's affordable.



School of

JRO

By Wilson Brissett, Senior Editor

Operation Eagle Claw—the 1980 attempt to rescue 52 American hostages held by Iran at the US Embassy in Tehran—was an utter failure. The debacle threw into sharp relief how difficult it had become for US forces to operate across service lines to accomplish a complex mission. An after-action report criticized the “ad hoc nature of the organization,” especially the military’s failure to make use of a joint structure for planning the operation.

Three years later, the invasion of Grenada—Operation Urgent Fury—again laid bare the US military’s trouble organizing itself for a joint fight.

Technically a success, the operation revealed embarrassing disconnects between the services.

In some cases, for example, commanders’ radios were incompatible.

These two operational fiascos motivated the sweeping Defense Department reorganization of the Goldwater-Nichols Act. It was in this same spirit of reforming the military’s joint structure that the Joint Requirements Oversight Council was created.

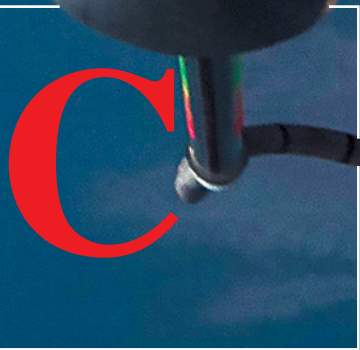
The JROC exists to achieve consensus across the services regarding acquisition priorities. Its job is to eliminate overlap and create efficiency in addressing the needs of field commanders and to give the consolidated requirements proper precedence in the Pentagon’s acquisition process.

The idea is for the JROC to balance the needs of the warfighter and the resources of the nation.

The group’s predecessor, called the Joint Requirements and Management Board, had been operating since 1984, but without the authority needed to overrule individual service chiefs.

The JROC itself was established in June 1986, four months before the passage of Goldwater-Nichols. The two headline-grabbing examples of the services not playing well together added impetus to its creation.

It was the third chairman of the council, Adm. William A. Owens, who envisioned the JROC as an authoritative body that could make the tough decisions for the joint force over the objections of individual service branch leaders, each of whom would naturally prioritize his own service. Owens’ JROC not only



worked on future programs, but turned toward existing systems to cut fat and increase interoperability.

Owens bypassed the Chiefs in the decision-making process and issued a recommendation that duplicative systems across the services be eliminated.

While his successors have often been more accommodating, Owens envisioned the JROC as a kind of joint police force for the individual services in the interest of creating a successful total military effort, and that vision has persisted.



DOD photo by TSgt. M. J. Green

Today, membership of the JROC is made up of the vice chairman of the Joint Chiefs of Staff, who leads the council, and the Vice Chief of each service. USAF Vice Chief of Staff Gen. Stephen W. Wilson represents the Air Force. Gen. Paul J. Selva, vice chairman of the JCS and also an Air Force officer, chairs the JROC.

A BALANCING ACT

“Keeping the US warfighter in mind is one of the most important aspects of my work for the JROC,” said Air Force Brig. Gen. David A. Krumm, deputy director for requirements with the JCS. He confirmed, though, that “the budget plays a very important part in JROC discussions” because “in an era of continued fiscal pressures, this [joint] perspective will continue to be very important.”

As such, the JROC must perform a perpetual balancing act. In the law governing its operation, the council is charged with “ensuring the consideration of trade-offs among cost, schedule, and performance objectives for joint military requirements.”

This makes the JROC a collaborative decision-making space. The top leaders from each service make the case for the systems they believe their service or the joint force needs the most, and then the group weighs the relative merits of some demands versus others.

Selva has focused on reconnecting the council with commanders in the field. During his July 2015 nomination hearing before the Senate, he said, “There’s an active effort inside the [JROC] to reinvigorate the relationship with the stakeholders who bring requirements to the table,” and he affirmed his commitment to that position.

As competitors like China and Russia modernize and advance, Selva has worked to speed up the JROC’s collaborative process.

When he arrived, decision-making on new requirements at the JROC had recently been trimmed from nine months to six months, on average. Selva is aiming to cut that time in half, so it will take only three months to move from setting a requirement to the start of an acquisition program of record.



The JROC is an arena of confrontation and critique. Each member is supposed to recognize that requirements must be trimmed and reconfigured

to meet the constraints of the DOD budget and the demanding tempo of ongoing operations.

Retired Gen. Larry O. Spencer, vice chief of staff of the Air Force from 2012 to 2015 and now president of AFA, said that at the beginning of his

JROC tenure, the process had grown to an unmanageable size.

“When I got there it was a room full of people,” Spencer recalled. “You didn’t even know who was involved.”

The sheer numbers slowed down the work of the JROC, but there were other

problems as well. Representatives of military contractors would often be present during deliberations involving their company’s programs, Spencer said, preventing a frank discussion among the principal members of the JROC. By the time Spencer retired, the JROC had begun restricting attendance, limiting the participants to a regular group much closer to the core membership of the council itself.

Early in his years with the JROC, another council member tried to persuade Spencer to adopt a go-along, get-along attitude.

NEEDS ARE NEEDS

The colleague said, “If you don’t criticize what I need, then I won’t criticize what you need,” Spencer said. But his time on the JROC convinced him that the council works best when its members are unafraid to question each other’s arguments about which systems are truly required. “It’s my job to criticize something I think is not critical to the joint mission,” Spencer said.

This confrontational edge produces results, he believes.

But what does JROC success look like? Council decisions sit at the top of the requirements hierarchy. The Deputy’s Management Action Group (DMAG) shapes the President’s defense budget and could still refuse to fund systems that received JROC approval, however. So for Spencer, “the more effective we were in the JROC, the more impact we had in the DMAG.”

Budget concerns have a lot to do with what the JROC decides. When the council has come under fire it’s often been because of a perceived unwillingness of members to say no to each other.

The JROC “has taken on a life of its own,” then-Rep. Loretta Sanchez (D-Calif.) said in a June 2014 meeting of the House Armed Services Committee. “Sometimes, just to get through the process can take more than a year. ... And it also seems to me, under JROC, that they didn’t want to pick winners and losers, and ... they’re still usually saying yes to everything.”

Sanchez, who lost her November bid for a Senate seat, might have had in mind the F-22 Raptor. Spencer



USAF photo by SSgt. Shawn Nickel



Government of Iran photo

Above left: Soldiers prepare to depart for a patrol during Operation Urgent Fury in Grenada on Oct. 28, 1983, with a C-130 taking off in the background. Above: SSgt. Eugene Tabita (l) watches as SSgt. Jacob Rinker, a JTAC, coordinates close air support for soldiers during a Red Flag exercise in June. Here: A destroyed helicopter lies in the desert after the attempt to rescue 52 US Embassy staffers held captive in Tehran on April 24, 1980.



USAF photo by A1C Joseph Pick

programs that the council knows could not all be afforded, Spencer said. The most important internal rhetorical tool at the JROC's disposal, therefore, is the phrase "yeah, but," Spencer said. The vice chiefs' mandate is to faithfully transcribe the requirements communicated by the combatant commanders (this is the "yeah"), but at the same time tailor those requirements to the realities of a joint force competing for limited resources (the "but"). Spencer acknowledged this is a tough balance to strike.

It seems that progress is being made in this direction. Without offering specifics, Krumm said that as a result of

mentioned it as an example where the JROC was not successful.

The F-22 program was originally slated to produce more than 700 aircraft but was reduced in several stages. Though a number of 381 had been endorsed by the JROC, then-Defense Secretary Robert M. Gates terminated the program. The last F-22 was delivered in 2012 after only 187 operational aircraft had been produced. Gates had said the jet had no application in the war in Afghanistan and that war with China or Russia was too remote a possibility.

Unless the JROC makes tough decisions to create a balance between "what we need to be successful in war and what we can afford," Spencer said, the system won't work.

CHIEF OF GOOD ENOUGH

Retired Vice Adm. David J. Venlet, then the former program executive officer for the F-35, made a similar point in response to Sanchez in 2014. He termed the JROC's mission as crucial. "We need somebody to be what I would call the 'chief officer of good enough,'" he said. He explained that the mission of the JROC is to find a compromise between requirements and resources without "dumbing down the requirements for our warfighters' needs."

These are "difficult decisions," Venlet went on to say, but "I believe the creation of the JROC was meant to do that," and the JROC leader then—Adm. James A. Winnifield Jr.—"has a very good view to push back on the programs."

USAF photo by TSgt. Javier Cruz



Top: Gen. Stephen Wilson (l), USAF vice chief of staff, speaks to Lt. Gen. Brad Webb, head of Air Force Special Operations Command, at Hurlburt Field, Fla. Above: An F-15 lands at Tyndall AFB, Fla., as an F-22 taxis to a parking area Dec. 12. The aircraft were participating in Checkered Flag 17-1 and Combat Archer 17-3, exercises to enhance interoperability between fourth and fifth generation aircraft.

Spencer agreed. "Every service wants the very best they can get," he said. "We all walk in there with a uniform on." But the joint nature of the JROC is intended to enable its members to transcend their commitment to individual services for the good of the total force.

It's tough, but "you have to figure out a way to take your service patch off," Spencer said.

Walking this line dominates JROC deliberations.

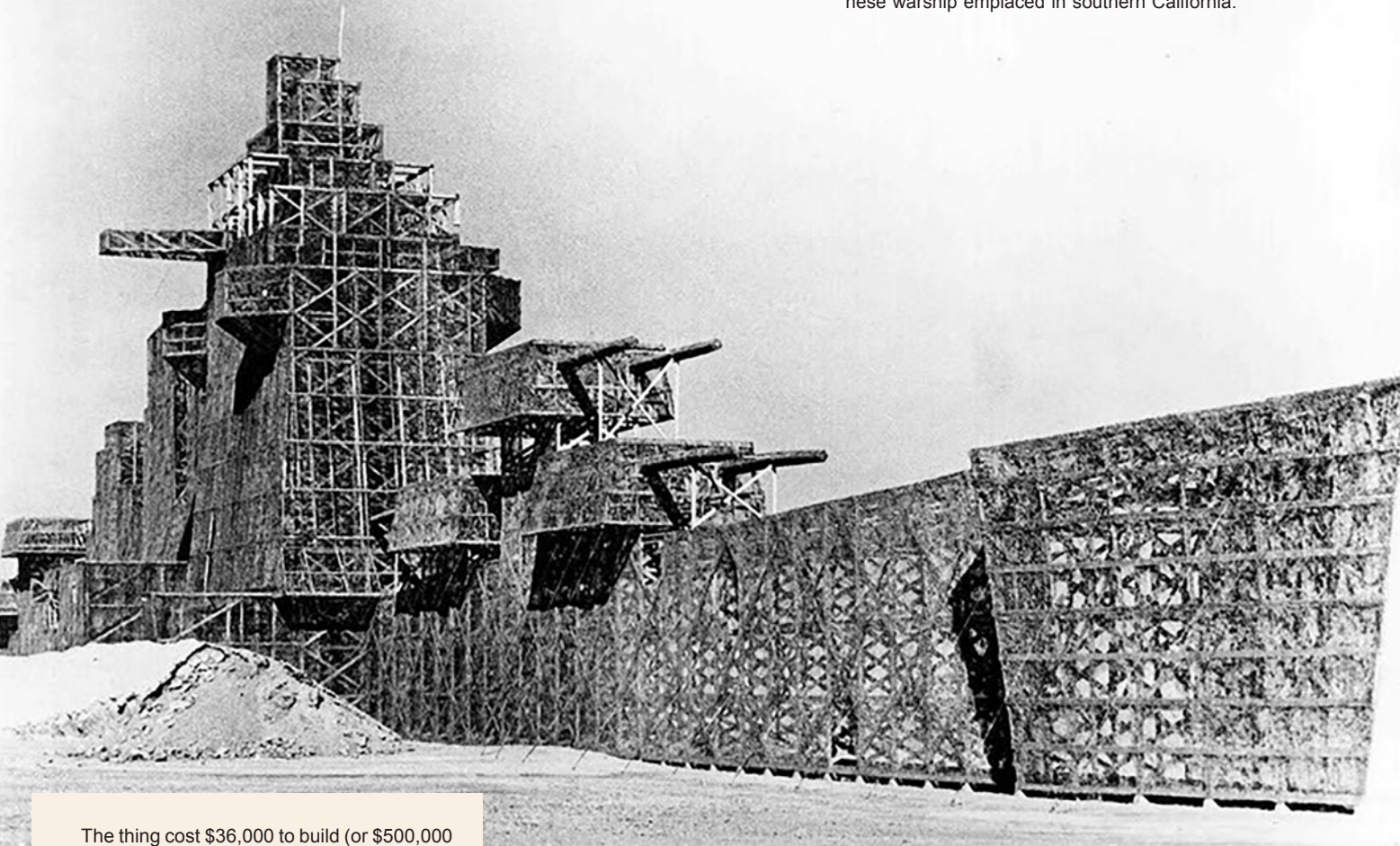
"It would not be responsible for us to send up a laundry list" of dream

its last review in 2015, the JROC had made changes to "make the process more deliberative."

Asking members to set aside their parochial views and see things in light of what's best for the all-around force isn't easy, especially for generals and admirals who've spent a career successfully advocating for their service's distinct needs. But when the JROC is able to do these two things, it provides crucial advice about what systems are "good enough" to win the fight and still live within the dollars available. ★

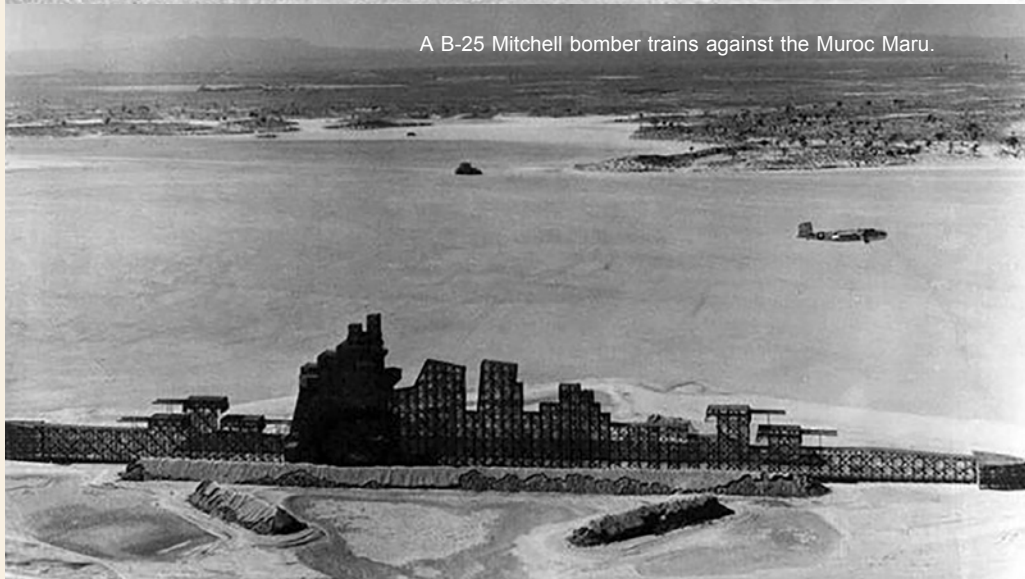
Ship of the Desert

The Muroc Maru was a 650-foot-long mock Japanese warship emplaced in southern California.



The thing cost \$36,000 to build (or \$500,000 today). It had a framework made of four-by-four lumber and chicken wire, which was then covered with tar paper. When completed in March 1943, it was given the designation of "AAF Temporary Building (Target) T-799." To military pilots at Muroc AAF, Calif., though, it was the "Muroc Maru" and looked for all the world like a 650-foot-long Japanese *Atago*-class heavy cruiser. From 1943 to 1950, Army Air Forces used the target for bombing practice, strafing practice, and identification training. Muroc Maru was banked with sand and that, along with the shimmering effect of the desert, made it seem to be sailing through the desert. The mock warship was declared a flight hazard and dismantled in 1950.

A B-25 Mitchell bomber trains against the Muroc Maru.



THE AIR AT



A painting hanging in Britain's National Museum of the Royal Navy shows a torpedo plane from HMS *Illustrious* attacking the ships at Taranto harbor on Nov. 11, 1940.

Painting by Charles David Cobb, The National Museum of the Royal Navy

The British torpedo bombers left three battleships sunk or sinking in the main harbor of the Italian battle fleet.



RAID TARANTO

By John T. Correll

On the night of Nov. 11, 1940, most of the capital ships of the Italian navy—including all six of its battleships—lay at anchor in the harbor at Taranto, which the Italian admirals believed to be secure. They were not overly concerned about the risk from concentrating the fleet.

Taranto, located inside the heel of the Italian boot, had strong defenses that included sound-detection devices to pick up airplanes 30 miles away, submerged breakwaters, jetties, anti-torpedo nets, barrage balloons, and hundreds of anti-aircraft guns.

The admirals recognized the theoretical danger of air attack. Taranto was within operational range for British carriers in the Mediterranean, but never in history had carrier-launched aircraft been used to strike a heavily defended naval base.

Previous assumptions about such an attack were about to be blown away.

Just before midnight, the first of two waves of open-cockpit Fairey Swordfish biplanes, launched from the British carrier HMS *Illustrious*, swept down on the anchorage at Taranto. The first two aircraft dropped flares to illuminate and backlight the Italian ships in the harbor. Close behind them came more Swordfish dropping torpedoes and bombs.

In 65 minutes, the attackers sank or severely damaged three of the battleships, two cruisers, two destroyers, and assorted other targets. Two of the Swordfish were shot down by anti-aircraft fire. In the House of Commons, Prime Minister Winston Churchill proclaimed that the loss to Italy of half its battleships “affects decisively the balance of naval power in the Mediterranean.”

Some nations were paying closer attention than others. Japan was especially interested and dispatched its naval attaché from Berlin to investigate. A group of Japanese naval officers visited Taranto for a further look, bringing a long list

of questions and interviewing as many eyewitnesses as they could.

Taranto is often described as the precursor or blueprint for the Japanese attack on Pearl Harbor 13 months later, but that is something of an exaggeration. Adm. Isoroku Yamamoto was already thinking about a strike on Pearl Harbor, possibly with aerial torpedoes.

There is little doubt, though, that Taranto confirmed the feasibility of Yamamoto’s idea. Serious planning of the attack and experiments to modify aerial torpedoes for use in the shallow waters of Pearl Harbor—about the same depth as at Taranto—began in early 1941.

CHALLENGE IN THE MED

Adm. Andrew B. Cunningham, commanding the British Mediterranean Fleet, was caught short-handed when Italian dictator Benito Mussolini declared war on Britain June 10, 1940.

Some of Cunningham’s assets had been transferred to the Home Fleet for the impending Battle of Britain. Other British forces were tied down in North Africa, where an Italian army was massed on the frontier between Egypt and Libya.

Cunningham had to keep the sea lanes open to the Suez Canal, the critical passage to India, Australia, and British possessions in Asia, but he had only a squadron of surface combatants and the aging carrier HMS *Eagle*, a converted battleship with an improvised flight deck.

The day after Mussolini declared war, Italian bombers from Sicily pounded British bases on Malta. Several clashes at sea ensued in July and August.

The Italians held a substantial numerical advantage in both ships and aircraft and a position of strategic advantage from their base at Taranto. Nevertheless, they had several weaknesses.

The fighting potential of the Regia Marina, the Italian navy, depended on its battleships. There were no aircraft carriers, Mussolini having decided that the entire peninsula of Italy functioned as a carrier. The defense of Taranto included Italian air force interceptors, but their bases were some distance away. None of the aircraft in southern Italy had a night-fighting capability.



Royal Navy photo by Lt. S. I. Bedell via Imperial War Museums

Fairey Swordfish torpedo bombers on a training flight from Scotland in 1940. Two waves of the open-cockpit bombers launched from *Illustrious* to wreak havoc on Taranto.

Italy's resources were strung out and strained by Mussolini's military adventures from the invasion of Ethiopia in 1935 and participation in the Spanish civil war to the invasions of Albania in 1939 and Greece in 1940 and the current challenge to the British in North Africa.

Mussolini's advisors warned him that the Italian industrial base could not readily replace ships lost in war and the admirals were reluctant to take risks. After Cunningham received reinforcements—including the newly commissioned carrier *Illustrious*—in September, he believed he could beat the Italians in an all-out naval battle.

STRING BAGS AND TORPEDOES

If the Italians, following their cautious strategy, would not come out to fight a major engagement, Cunningham would go into Taranto to get them. The notion of a carrier-launched attack on Taranto dated back to the Ethiopian invasion.

The plan was updated in 1939 and the man who had updated it, Lumley Lyster, arrived in September aboard *Illustrious* as the new rear admiral for carriers of the Mediterranean Fleet. He presented a plan for attack to Cunningham, who laid it on with the designation of Operation Judgment.

The strike was set for Oct. 21, the anniversary of Lord Nelson's celebrated

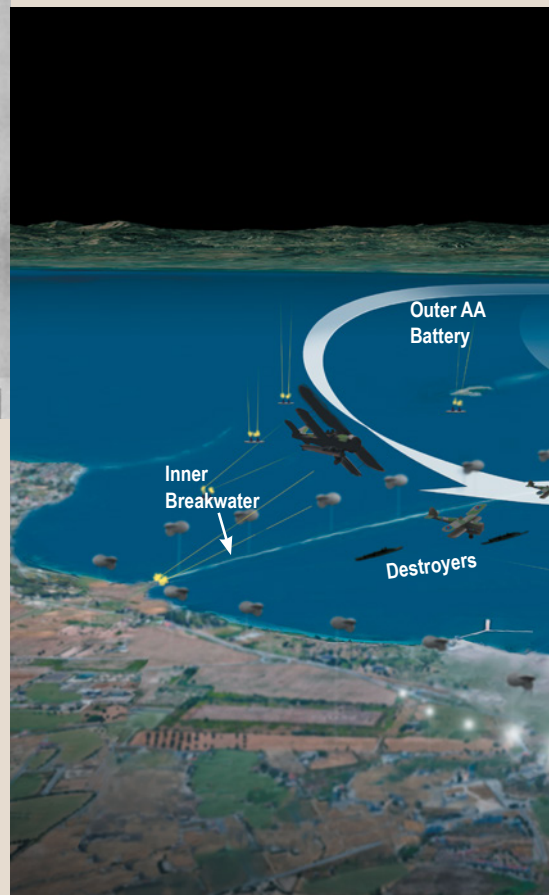
victory at Trafalgar in 1805. The two carriers, *Eagle* and *Illustrious*, were to launch a total of 30 Fairey Swordfish aircraft, carrying a combination of torpedoes and bombs.

The Swordfish entered service in 1936 and was outmoded even then. Its biplane configuration was old-fashioned and it was painfully slow. The top speed was officially rated at 143 mph when carrying weapons, but according to fleet air arm crews, it seldom went faster than 100. The aircrews in the open cockpits wore heavy insulated flying suits for protection against the cold.

For all of that, the Swordfish was sturdy and reliable. It was popular with the crews who affectionately called it the "String bag," named supposedly for the knotted string bags used by shoppers in England and referring to the Swordfish's versatility in carrying things. By an alternate explanation, "String bag" derived from the web of rods and struts between the upper and lower wings.

The Swordfish normally had a crew of three: a pilot, an observer, and a gunner. The observer, more important than suggested by his title, handled navigation, reconnaissance, and target recognition. The pilot sat in the front cockpit and the gunner and the observer shared the larger second cockpit.

The Taranto mission required supplementary long-range fuel tanks, which were usually slung under the Swordfish fuselage. That was not possible when carrying torpedoes, which had to be mounted centerline between the wheels. Thus the fuel tank was put into the observer's space. The observer moved



to the smaller seat previously occupied by the gunner, who was scrubbed from the crew.

The base at Taranto was divided into inner and outer harbors, connected by a small canal. The battleships were in the larger outer harbor, protected by a breakwater and anti-torpedo nets. Several of the cruisers and some of the destroyers were in the inner harbor.

The battleships with their heavy armor plating were too tough to knock out with bombs so half the Swordfish carried torpedoes. The other half would use bombs against the cruisers and destroyers.

The conventional wisdom was that air-dropped torpedoes could not be used in water less than 75 feet deep. If the water was too shallow, the torpedo would not be able to recover from its steep plunge and begin tracking

toward the target. Taranto harbor was 40 feet deep.

What the Italians did not know was that the British had found a solution. The nose of the torpedo was hooked to a wire wound on a drum beneath the aircraft. Upon launch, the wire pulled the nose of the torpedo up so

the carriers in the dark. The operation was rescheduled for Nov. 11, with fewer aircraft.

The next glitch came in early November with the discovery that *Eagle* needed emergency repairs. The hull had been shaken by near misses during the summer battles, damaging the pipes

Swordfish plenty of room to maneuver between them.

On Nov. 11, the day of the attack, the Italians had scheduled a gunnery exercise at sea and spent much of the morning in the extensive task of removing the torpedo nets around the ships. The exercise was canceled but the torpedo nets had not been rigged.

The movements of *Illustrious* were concealed within the broader context of Operation MB8, an elaborate series of British actions in early November timed to provide additional cover for the air strike. Among other distractions, a group of cruisers and destroyers would run slightly ahead of *Illustrious*, between the carrier and Taranto.

The delay from the fire had put the attack on Taranto after Italy's invasion of Greece Oct. 28, which further obscured the activity of the British fleet.

THE SWORDFISH LAUNCH

A few hours before the attack on Nov. 11, an RAF reconnaissance airplane from Malta overflew Taranto and confirmed that the Italian fleet was still in place. Packed into the inner and outer harbors were six battleships, nine cruisers, 28 destroyers, and other vessels.



Staff illustration by Mike Tsukamoto

The first wave of Swordfish aircraft (white arrow) struck the ships in the harbor at 11:35 p.m., the second (orange arrow) at 12:11 a.m. The entire raid lasted a little more than an hour.

that after falling from low level, it hit the water in a belly flop instead of a dive. Attack was possible in water as shallow as 22 feet.

BAD LUCK AND GOOD LUCK

Both the makeup of the air strike and the timing were changed by intervening surprise events. On Oct. 18, three days before the scheduled mission, a mechanic fitting an auxiliary fuel tank on one of the Swordfish dropped a tool, setting off a spark and causing a fire that destroyed two airplanes and badly damaged three others.

The attack had to be postponed. The moon would not be full again until the middle of November, which would give the aircrews greater visibility over Taranto and when returning to

that carried aviation fuel within the ship. The danger of fire or explosion was so great that *Eagle* was withdrawn from action.

Illustrious would be the lone carrier for the strike. Several more aircraft were lost in accidents Nov. 9-10, leaving 21 Swordfish as the attack force aboard *Illustrious*.

These misfortunes were offset by several pieces of good luck for the British. Initially, the Taranto harbor was protected by 90 barrage balloons, tethered on steel cables that could tear the wings off low-flying airplanes. Sixty balloons were lost in a storm Nov. 6 and had not yet been replaced. With only 30 balloons remaining, the cables were 900 feet apart—three times the previous spacing—allowing the

Royal Navy photo by Lt. C. H. Parnall, via Imperial War Museums



Adm. Andrew Cunningham, commander of the British Mediterranean Fleet, was elated by the success of the daring torpedo and bombing raid.

The Swordfish were divided into two waves because *Illustrious* could launch only 12 of them at a time. The first wave, led by Lt. Cmdr. Kenneth Williamson, was off at 8:30 p.m. Six of the airplanes had torpedoes; four had bombs, and two had flares and bombs.

En route, they encountered thick fog. Most of the squadron, following standing orders, climbed to higher altitude to get above it, but Lt. Ian Swayne did not. Separated from the others, he assumed he had fallen behind and proceeded to Taranto at lower altitude to make up time. In fact, he was well ahead, arriving 15 minutes before his colleagues, alerting the air defenses and setting off flak from the shore batteries.

The sound-detection equipment had picked up Swayne's approach some distance out but the Italian air force had no night-fighter interceptors nearby. The Italians would not put up a single fighter that night, which was critical to the survival and success of the slow-moving Swordfish.

As soon as the last of Williamson's airplanes were away, the ship's crew brought the nine aircraft for the second wave up to the deck—five with torpedoes, two with bombs, and two with flares and bombs. Launch began at 9:20 p.m., with Lt. Cmdr. J. W. Hale leading.

The last two Swordfish bumped wings on the deck. Lt. W. D. Morford was able to take off, but Lt. Edward W. Clifford was held back until the repair crews fixed the damage to his aircraft, which took about 15 minutes. He launched anyway, hoping to catch up.

Meanwhile, Morford was having problems. The bump had caused more damage than was apparent. The straps holding the extra fuel tank gave way and the tank fell into the sea. He had to abort and return to the carrier.

The mission was now down to 20 Swordfish, one of them arriving early at Taranto and another one getting there late.

OVER TARANTO

The first wave reached Taranto at 11:12 p.m. The first two airplanes circled around at high altitude and dropped a string of flares along the eastern rim of the harbor, backlighting the targets for the strike aircraft approaching from the west. The ground gunners banged away at the flare droppers, but it did no good. The flares fell 1,000 feet before igniting and the airplanes had moved on.

Close on the heels of the flare droppers came flight leader Williamson with Lt. Norman Scarlett as his observer. They swept in very low, between the barrage balloons, and released their torpedo 20 or 30 feet above the water. It tracked unerringly to the battleship *Conte di Cavour* and blew a 40-foot hole in the hull.

Moments later, Williamson and Scarlett were shot down. Their airplane crashed into the harbor but the Italians

fished them out. They spent the rest of the war as POWs.

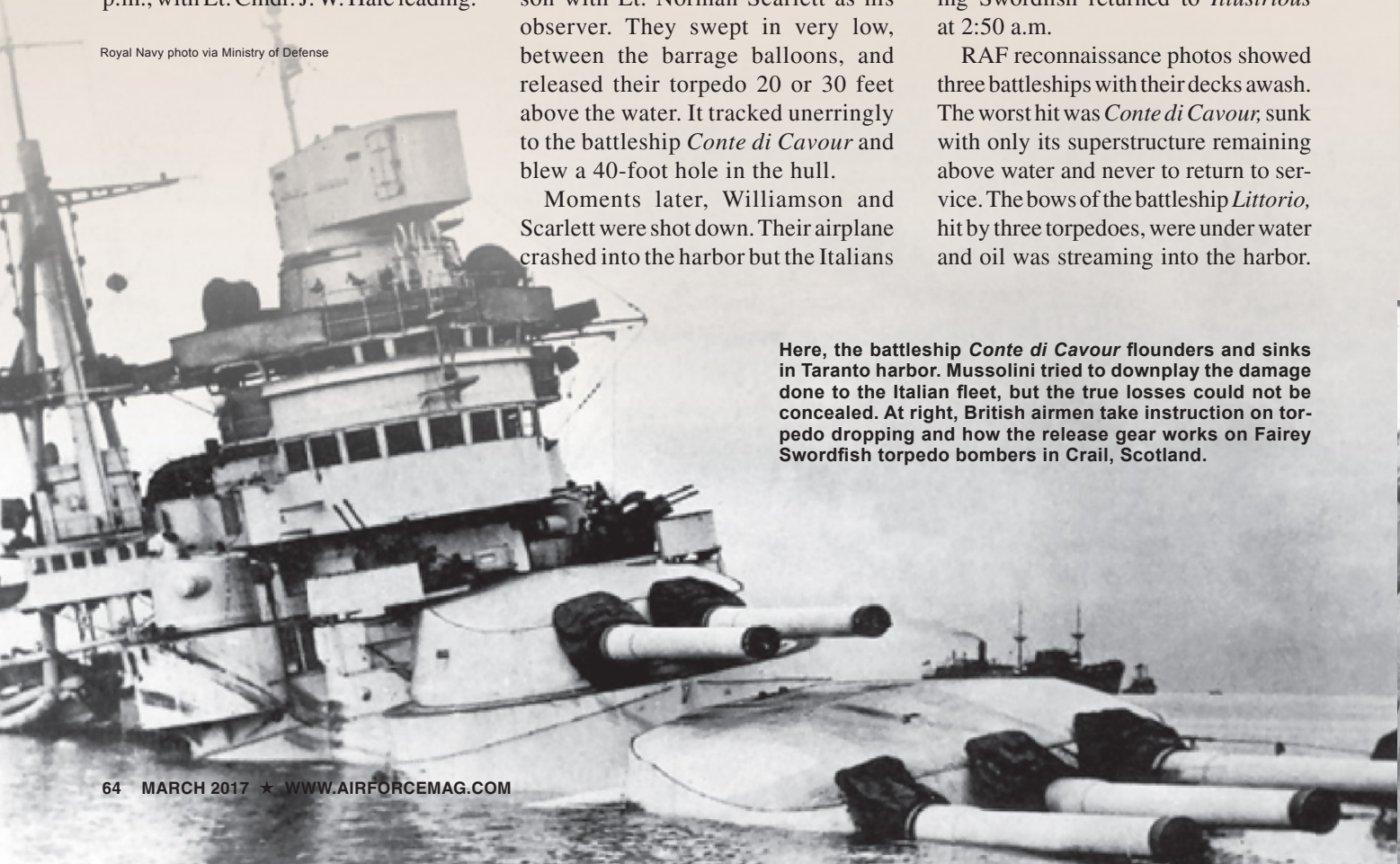
Other Swordfish were scoring hits, too, but it was difficult to tell which weapons were causing what damage. The attackers were flying so low the Italians could not shoot at them effectively at depressed trajectory for fear of hitting their own ships. Nor could they make good use of their searchlights, which would mostly have blinded their own gunners.

The first wave completed its strike at 11:35 p.m. and there was a lull before the second wave attacked at 12:11 a.m. Again, the flare droppers came first and the strikers continued the toll on the Italian fleet. A second Swordfish was lost to a direct hit by the anti-aircraft guns. Neither of the airmen, pilot Lt. G. W. Bayley or observer Lt. H. J. Slaughter, survived as their airplane burst into flames and fell into the water.

About 12:30 a.m., shortly after the last of his colleagues had departed, Clifford reached Taranto, his wing repairs holding up just fine. He attacked a cruiser in the inner harbor, but his bomb was defective. It punched a hole in the deck but failed to explode. Clifford was clear of the harbor defenses by 12:35 a.m. and the air raid was over. The last surviving Swordfish returned to *Illustrious* at 2:50 a.m.

RAF reconnaissance photos showed three battleships with their decks awash. The worst hit was *Conte di Cavour*, sunk with only its superstructure remaining above water and never to return to service. The bows of the battleship *Littorio*, hit by three torpedoes, were under water and oil was streaming into the harbor.

Here, the battleship *Conte di Cavour* flounders and sinks in Taranto harbor. Mussolini tried to downplay the damage done to the Italian fleet, but the true losses could not be concealed. At right, British airmen take instruction on torpedo dropping and how the release gear works on Fairey Swordfish torpedo bombers in Crail, Scotland.



A third battleship, *Caio Duilio*, was beached in shallow water to prevent its sinking completely. The torpedo had blown a hole between two magazines. Had it struck a few yards either way, *Caio Duilio* would have been done for.

The raid had also sunk or damaged two cruisers and two destroyers as well as causing fires and losses to other ships, the oil storage depot, and the dockyard. Two of the battleships were refloated, repaired, and eventually returned to service.

IN THE WAKE OF TARANTO

The Italians tried to minimize the bad news, announcing that one ship was “gravely damaged” and that they had shot down six British airplanes, but the actual losses could not be concealed. In *The New York Times*, Hanson W. Baldwin noted that the British “achieved their greatest results with the torpedo rather than the bomb” and that the raid marked an “increasing accuracy of attacks from the air against ships on the sea.”

Cunningham was jubilant, declaring, “In a total flying time of six and a half hours—carrier to carrier—twenty aircraft had inflicted more damage upon the Italian fleet than was inflicted upon the German High Seas Fleet in the daylight action at the Battle of Jutland.”

The Italians, rattled by the attack, pulled their major warships out of Taranto for a safer harbor at Naples, far to the north and no threat to the British convoys. They never again used Taranto as a major base for their battle fleet.

The strategic gain in the Mediterranean was diminished somewhat in 1941 when the Germans, no longer trusting the Italians, moved Luftwaffe bombers and

fighters into the area in large numbers to block and harry the British.

Seldom in the history of warfare had a handful of old airplanes inflicted so much damage on an enemy, but Taranto never received the acclaim of other noteworthy battles. Little more was said after Churchill’s statement to the House of Commons about the balance of power in the Mediterranean. Later, ruminating on the war on the southern flank and the 1942 Battle of El Alamein, Churchill said, “Before Alamein we never had a victory. After Alamein, we never had a defeat.”

The Swordfish remained in service until 1945 and figured in one more major engagement. In May 1941, it was Swordfish torpedo bombers flying from the carrier *Ark Royal* that disabled the German battleship *Bismarck*, enabling British battleships and destroyers to finish the job and sink it.

Cunningham returned to Britain in 1943 as First Sea Lord, holding that position until his retirement in 1946 in the five-star grade of admiral of the fleet. Vice Adm. Inigo Campioni, commander of the Italian battle fleet, was relieved of duty and became governor of the Dodecanese islands in the Aegean.

Illustrious, attacked by more than 70 German bombers and fighters in the Mediterranean in January 1942, sustained major damage, was repaired in the United States, and returned to duty. After the war, *Illustrious* served as a training carrier and troop transport until decommissioning in 1955.

The United States was slow to catch on to the significance of Taranto. In a letter in February 1941 to Adm. Husband E. Kimmel, commander of the

US Pacific Fleet, the Chief of Naval Operations, Adm. Harold R. Stark, expressed the opinion that “a minimum depth of water of 75 feet may be assumed necessary to successfully drop torpedoes from planes.” Pearl Harbor, where Kimmel’s fleet was anchored, was 40 feet deep, about the same as Taranto.

That assessment was modified by a round-robin message dispatched in June 1941 by Rear Adm. Royal E. Ingersoll, assistant CNO, who said that in view of “recent developments”—specifically citing Taranto—the Navy could “no longer assume a requirement of depth of 75 feet for aerial torpedo operations.” Incredibly, he added erroneously that the torpedoes at Taranto had been at depths between 11 and 15 fathoms, meaning 66 to 90 feet.

PREVIEW OF PEARL HARBOR

The Japanese naval attaché discussed what he had learned at Taranto with Cmdr. Minoru Genda, who planned the Pearl Harbor operation, and with Cmdr. Mitsuo Fuchida, who led the attack. The report from the Japanese navy officers who visited Taranto was studied carefully.

Early on, Yamamoto’s proposal for an attack on Pearl Harbor met with great resistance in military and naval circles in Japan, but Taranto lent strong support to his case. His decision to strike Pearl Harbor was made in December 1940. In January 1941, he assigned serious planning for the use of aerial torpedoes.

The Japanese did not use the spooled wire technique developed by the British for delivery of aerial torpedoes in shallow water. Their own experiments produced a torpedo with wooden fins which worked in 36 feet of water in tests between January and September 1941.

Forty of the Nakajima B5N bombers that Fuchida led over Pearl Harbor on Dec. 7, 1941, carried aerial torpedoes. They were very effective along Battleship Row. ★

John T. Correll was editor in chief of *Air Force Magazine* for 18 years and is now a contributor. His most recent article, “Jack Northrop and the Flying Wing,” appeared in the February issue.

Royal Navy photo by Lt. L. Peilman via Imperial War Museums



Maxims of Mad Dog Mattis

At the time, of course, no one knew he would become President Donald Trump's Secretary of Defense. James N. Mattis in the winter of 2015 was just a retired Marine Corps general with deep combat experience. The Senate Armed Services Committee wanted to hear his views on defense topics.

What they got was a pointed denunciation of Washington's "reactive crouch" and "strategy-free" actions under President Obama; insistence that America "lead from the front" and "remain strongly engaged" in foreign relations; and a roadmap for the proper use of US military power.

The world is awash in change. The international order, so painstakingly put together by the greatest generation coming home from mankind's bloodiest conflict, ... is under increasing stress. It was created with elements we take for granted: the United Nations, NATO, the Marshall Plan, Bretton Woods, and more. ...

The constructed order reflected the wisdom of those who recognized no nation lived as an island and we needed new ways to deal with challenges that, for better or worse, impacted all nations. Like it or not, today we are part of this larger world and must carry out our part. ... We must remain strongly engaged. ...

The international order built on the state system is not self-sustaining. It demands tending by an America that leads wisely. ... America [must] adapt to changing circumstances, to come out now from its reactive crouch and to take a firm strategic stance in defense of our values. ... For certain we have lived too long now in a strategy-free mode. ...

America needs a refreshed national strategy. ... There is an urgent need to stop reacting to each immediate vexing issue in isolation. Such response often creates unanticipated second order effects and more problems for us. ... We [must] act strategically and morally, using America's ability to inspire as well as its ability to intimidate to ensure freedom for future generations. ...

With a smaller military comes the need for troops kept at the top of their game. When we next put them in harm's way it must be the enemy's longest day and worst day. Tiered readiness with a smaller force must be closely scrutinized to ensure we aren't merely hollowing out the force. ...

Strategy connects ends, ways, and means. With less military available, we must reduce our appetite for using it. ... Absent growing our military, there must come a time when moral outrage, serious humanitarian plight, or lesser threats cannot be militarily addressed. Prioritization is needed if we are to remain capable of the most critical mission for which we have a military: to fight on short notice and defend the country. ...

The need for stronger alliances comes more sharply into focus as we shrink the military. No nation can do on its own all that is necessary for its security. ... A capable US military, reinforcing our political will to lead from the front, is the bedrock on which we draw together those nations that stand with us against threats to the international order. ...

"Views on Global Challenge"

Gen. James N. Mattis, USMC (Ret.)
Testimony
Senate Armed Services Committee
Washington, D.C.
Jan. 27, 2015

Find the full text on the
Air Force Magazine's website
www.airforcemag.com
"Keeper File"



Echoes from the past from retired Gen. James "Mad Dog" Mattis.

When we make clear our position or give our word about something, our friends (and even our foes) must recognize that we are good for it. ... This means that the military instrument must be fit for purpose and that ... our position is backed up by a capable military making clear that we will stand on our word.

When the decision is made to employ our forces in combat, the committee should ask if the military is being employed with the proper authority. ...

Are the political objectives clearly defined and achievable? Murky or quixotic political end states can condemn us to entering wars we don't know how to end.

Notifying the enemy in advance of our withdrawal dates or reassuring the enemy that we will not use certain capabilities like our ground forces should be avoided. Such announcements do not take the place of mature, well-defined end-states, nor do they contribute to ending wars as rapidly as possible on favorable terms.

Is the theater of war itself sufficient for effective prosecution? We have witnessed safe havens prolonging war. If the defined theater of war is insufficient, the plan itself needs to be challenged to determine feasibility of its success or the need for its modification. ...

Is the authority for detaining prisoners of war appropriate for the enemy and type [of] war that we are fighting? ... We should not engage in another fight without resolving this issue up front, treating hostile forces, in fact, as hostile.

Are America's diplomatic, economic, and other assets aligned to the war aims, with the intent of ending the conflict as rapidly as possible? We have experienced the military alone trying [to] achieve tasks outside its expertise. When we take the serious decision to fight, we must bring to bear all our nation's resources. *



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Learning lessons from combat is an essential part of the military art. Militaries anxious to avoid the old cliché of fighting the last war study carefully the conduct of previous armed conflicts, looking for new knowledge they can apply to the future.

In 1946, an officer teaching at the Army's General Staff School wrote an article for the service's flagship journal, *Military Review*. In it, Lt. Col. John H. Swenson looked at the 1944 Normandy campaign and concluded that while airpower had solved the problem of strategic maneuver, it hadn't been applied at the level of tactical maneuver.

Swenson's prescription was a "Horse Cavalry Glider Squadron," comprising three rifle troops equipped with machine guns and recoilless rifles, a weapons troop, and 800 horses. Some 100 gliders would transport this squadron. It would be flown/towed and then landed behind enemy lines. The troops would then mount up, draw sabers, and charge. Swenson believed that the appearance of such an unorthodox unit would cause panic among the enemy high command. The moral of the story: Not all lessons learned are *correct* lessons learned.

"Lessons learned" became an institutionalized effort in the US following

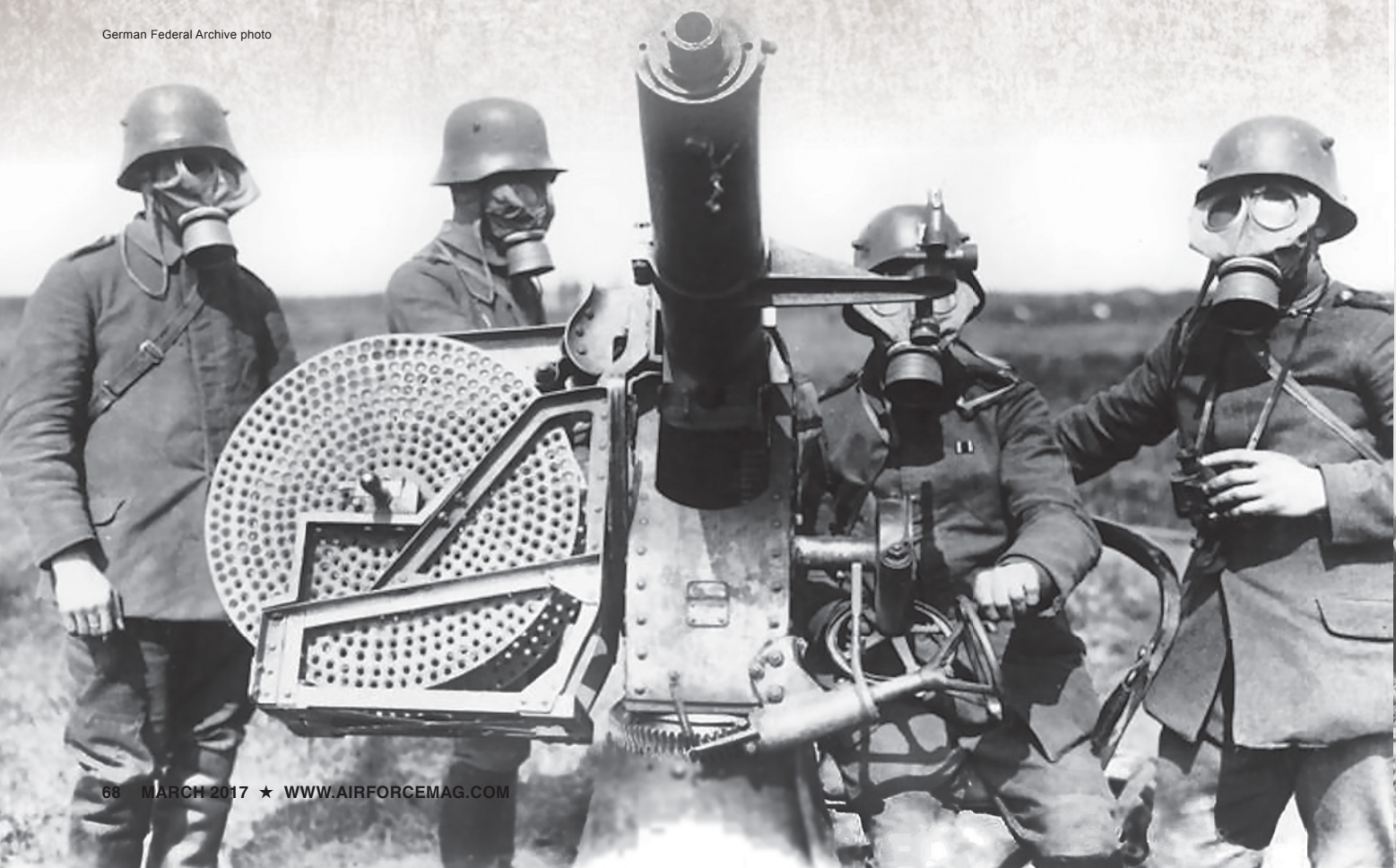
the 1991 Gulf War. The Joint Staff's J-7 directorate was given responsibility for analyzing operations, devising solutions to thorny problems, codifying new ideas, and then disseminating them to the services. The joint lessons learned "primer" lists the four phases in this process: discovery, validation, integration, and evaluation. A seemingly simple process, but if a lesson was not properly learned during the evaluation phase, the manual directed the unit to return to the integration phase and try again. In other words, lessons identified during the validation and integration phases were assumed to be

LEARNING THE NOT-SO-OBVIOUS LESSONS

Sometimes getting to real knowlege takes some digging.

By Phillip S. Meilinger

German Federal Archive photo



Previous page: A German anti-aircraft crew wears gas masks while manning their gun in 1915. The Germans and the French faced each other across trenches on the Western Front for four years.

correct. But what if you are codifying the wrong lessons?

The classic case of learning questionable lessons came after World War I. The French and German armies had faced each other across a stagnated front for four years. Despite massive casualties, neither side was able to break the trench stalemate until the very end. Arguably, the breakthrough and eventual Allied victory were as much the result of hundreds of thousands of American reinforcements and the cumulative effects of starvation and war weariness on the German side, as it was due to new ideas or tactics.

MAGINOT AND BLITZKRIEG

In the aftermath, both countries formed cadres of top combat veterans to study the war and propose ideas to ensure such a stalemated blood bath didn't reoccur. About 500 German officers—about a quarter of them airmen—examined the issue for a year and came up with a proposed solution: lightning war, later termed blitzkrieg, that would employ tactical airpower, combined with motorized/mechanized infantry and tanks. The Germans believed the last war demonstrated that mobility must be restored to the battlefield, and blitzkrieg was the way to do it.

The French, the melancholy victors, conducted a similar exercise but came up with a different answer—one that emphasized defense rather than offense. France aimed to avoid losing

German infantry troops on Aug. 7, 1914. The French developed the Maginot Line from "lessons learned" during World War I—but the Germans developed the concept of blitzkrieg.

French troops man machine guns in the ruins of a cathedral near the Marne in 1918. The French and Germans drew differing lessons from the horror of World War I.



Central News Photo Service-US War Department photo via National Archives

another generation of young men in the next war by creating an impenetrable barrier: what became the Maginot Line. This massive trench and fortress system, consisting of heavily fortified, fixed defensive bastions—in some sectors connected by underground rail lines—would force the Germans to bleed themselves white attempting to breach it.

Both sides had faced the identical tactical situation, but after due consideration, came to diametrically opposed solutions. In 1940 it was clear the French had learned the wrong lessons.

Airmen also studied the war closely, hoping to glimpse the future. In some cases, they proved prescient, in other instances, they guessed wrong.

In his first book, *Our Air Force: The Key to National Defense*, published in 1921, Brig. Gen. Billy Mitchell argued that pursuit aircraft (today's fighter and attack aircraft) should make up the bulk of an air force because they had the most vital mission. Within a decade, he'd changed his mind, emphasizing instead the role of bombing.

Mitchell's intellectual descendents in the Air Corps Tactical School (ACTS) at Maxwell Field in Montgomery, Ala., tended to agree. These bomber advocates, echoing the views of those like Giulio Douhet in Italy and Royal Flying Corps Maj. Gen. Hugh M. Trenchard in Britain, believed bombers were unstoppable, able to penetrate deep into enemy territory and destroy vital centers. They gave short shrift to the need for protective escort for bombers. In the era before radar this was not a silly notion. Even so, some pursuit advocates at ACTS disputed the ability of the bombers to defend themselves, arguing the bomber would not always get through.

CONSEQUENCES OF MYOPIA

Regrettably, pursuit experts who taught at the tactical school—men like Capt. Claire Lee Chennault (later of Flying Tigers fame) and 1st Lt. Hoyt S. Vandenberg (later USAF Chief of Staff)—rejected the notion of fighter escort for bombers. Both argued that the defining aspect of pursuit was

US War Department photo



its aggressive, offensive nature. It would be inappropriate and indeed counterproductive, they argued, to assign pursuit a defensive mission—the passive role of bomber escort.

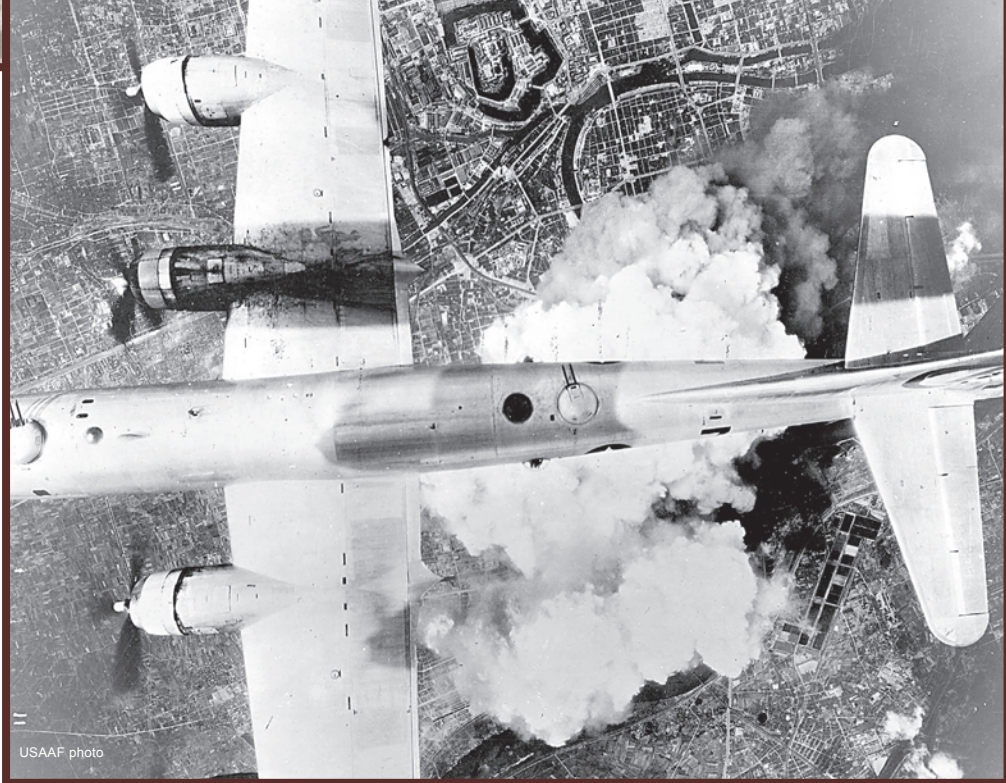
The consequences of this myopia played out early in World War II. British bombers retreated to the safety of night to avoid decimation during unescorted daylight raids. Meanwhile, the daytime bombers of Eighth Air Force suffered severe losses over Germany through 1943, when the P-47 and P-51 arrived with drop tanks, extending the fighters' range to equal that of the bombers. Coupling this development with a new offensive doctrine—employing escorts to seek out and destroy the Luftwaffe—provided air superiority and eventual victory. Combat experience had proved the need for escort fighters, and that was a valuable lesson learned.

Then-1st Lt. Haywood S. Hansell Jr., a member of the faculty at the tactical school in 1934, earned a reputation in the Bombardment Section there and began, along with several others, to articulate the doctrine of high-altitude, daylight, precision, formation bombing. Hansell was selected in 1941—along with others who'd also taught bombardment at the tactical school—to devise an air war plan for the defeat of Germany. Their effort, AWPD-1, was a milestone in the development of airpower—a blueprint for a huge strategic bomber campaign to achieve victory.

Not just a thinker and planner, Hansell also commanded a bomb wing in Eighth Air Force, putting his ideas into practice in the skies over Germany. Hansell's success prompted Gen. Henry H. "Hap" Arnold to name him commander of the new XXI Bomber Command in the Mariana Islands, home of the formidable new B-29s. Hansell launched into planning and conducting a strategic air campaign against Japan.

DIFFERENT AND DIFFERENT

But this was a different war, in a different theater, against a different enemy, employing different aircraft. The ideas and tactics Hansell had pioneered and used so successfully against Germany simply didn't work



B-29 *Incendiary Journey* during a mission over Osaka, Japan, in 1945. Gen. Curtis LeMay saw that bombing tactics that had worked well over Germany would not work in Japan and scuttled years of lessons learned practically overnight.

in the Pacific. In January 1945, Arnold relieved Hansell and replaced him with the pragmatic Maj. Gen. Curtis E. LeMay. He, too, had been an innovator and commanded bombers over Europe, but was not married to past doctrines and tactics. LeMay stripped the B-29s of their guns and sent the bombers in without escort at night, using incendiaries to bomb Japan into submission. LeMay's new tactics worked. Ten years of doctrine,

seemingly confirmed in the skies of Europe, were dropped at one sweep.

During the Cold War against the Soviet Union, bomber tactics were discussed anew. The intercontinental distances involved seemed to rule out the use of fighter escort. After much thought and experimentation, LeMay's Strategic Air Command would come to rely on low-level penetration, speed, decoys, and electronic warfare to survive Soviet air defenses. Fighter escort fell by the wayside.





An F-15E drops four JDAMs during a developmental test at Edwards AFB, Calif., in 2002. Precision weapons have become ubiquitous for their accuracy and efficiency.

During the Korean War, hard experience showed once again that unescorted bombers—B-29s at least—couldn't survive against Soviet-built jet fighters like the MiG-15. After suffering heavy losses, the bombers resorted to night operations unless heavy jet fighter escort was provided.

By the onset of the Vietnam War a decade later, the revolutionary aspect of aerial refueling converted tactical fighters like the F-105 and F-4 into strategic bombers. These aircraft would strike North Vietnam using in-flight refueling on their way to and from the targets. Other fighters, not carrying heavy air-to-ground ordnance, would serve as escorts.

During the 1950s and '60s when SAC was ascendant, the fighters of Tactical Air Command were focused on dropping nuclear weapons. The organization feared losing resources or being marginalized, and so developed large fighters like the F-105, incorporating an internal bomb bay for carrying a nuclear weapon. By 1965, USAF fighter pilots spent as much time practicing how to drop nuclear weapons as they did employing conventional munitions for interdiction or close air support. More ominously, their air-to-air combat skills were allowed to atrophy, and USAF fighters over North Vietnam could barely hold

their own against the enemy's nimble MiGs. It would take new programs and emphasis, especially Red Flag (and for the Navy, Top Gun) to refocus fighter pilots on air-to-air combat. By the end of the Vietnam War the transformation had taken place.

SUCCESS STORIES

Since the 1970s, new aircraft such as the F-15 and F-16, combined with new weapons and sensors and realistic training, have made USAF overwhelmingly dominant in air combat. The US hasn't suffered a single loss in air-to-air combat since 1973. This success stemmed from learning the right lessons over Southeast Asia.

Precision guided munitions (PGMs) are another success story. It is difficult to exaggerate the revolutionary effect of having munitions that routinely land mere feet from their aim points. Although tested in World War II, PGMs weren't used extensively in combat until the later stages of the Vietnam War. The iconic example of this was the Thanh Hóa Bridge in North Vietnam. Hundreds of unsuccessful strikes were flown against this vital railway bridge near Hanoi, at the loss of 11 aircraft. Then, in April, 1972, a single flight of F-4s carrying laser guided bombs dropped the bridge while sustaining no losses.

Even so, the 1991 Gulf War was the first conflict in which precision weapons played a major role. Although the US used several types of PGMs—electro-optical, infrared, laser guided, and cruise missiles using ground tracking radar—it was laser guided bombs that caught the public's attention. The world saw memorable cockpit display footage of bombs flying down air shafts and through bunker doors. Nonetheless, of the more than 200,000 bombs dropped during Operation Desert Storm, only seven percent were PGMs, and only a small percentage of US aircraft were equipped to drop them.

The lesson learned was that precision weapons sharply reduce the number of aircraft needed to destroy targets. The calculus changed from aircraft per target to targets destroyed per aircraft.

The Air Force and Navy thus embarked on an aggressive program to design and develop a wide variety of PGMs and expand the number of aircraft that could employ them.

During Operation Allied Force over Serbia in 1999, PGM use increased to 32 percent of all air weapons used, and in Afghanistan the number jumped to 55 percent. In Iraq, the percentage climbed to 70 percent, and nearly all US strike aircraft are now equipped to deliver PGMs, which have only gotten better with time.

Accuracy is now usually within a couple of yards, and new weapons can see through clouds, smoke, and sandstorms and can even track and strike moving targets. Some weapons can be loaded with their targets before takeoff, while others, such as the new Small Diameter Bomb II, can have its target changed during a glide of up to 46 miles from the release point.

PARALLEL WARFARE

This new capability—the capacity to strike many targets simultaneously with precision and at range, across an entire theater—is called parallel warfare and is one of the enduring lessons from the 1991 Gulf War. More individual targets were hit in the first 24 hours of Desert Storm than Eighth Air Force had struck in all of Germany during 1942 and 1943.

The development and use of PGMs during the Vietnam War, but especially in the decades thereafter, is one of the great lessons-learned success stories.

The US has enjoyed mixed results in wars since 1945. Korea was a tie—at considerable cost—and the Vietnam War, despite more than a decade of effort, over 58,000 Americans dead, and billions of dollars spent, failed to prevent that country from falling to communism. Desert Storm, as well as operations over the Balkans in the 1990s, Libya, and the initial takedowns of the Afghan and Iraqi regimes in 2001 and 2003, can all be counted as successful, but the long-term results of the campaigns in Iraq and Afghanistan remain to be seen.

American victories have broadly been marked by the judicious use of air and space power teamed with special operations forces (SOF), augmented by indigenous ground troops (such as the Kosovar Liberation Army in the Balkans, the Northern Alliance in Afghanistan, the Kurds in northern Iraq, and forces opposed to Muammar Qaddafi in Libya). Another critical element was the large and networked US system of intelligence, surveillance, and reconnaissance (ISR) assets.

In Afghanistan, SOF troops, teamed with the indigenous Northern Alliance and backed by ubiquitous ISR and American airpower, resulted in a rapid and lopsided victory. While the Northern Alliance, even abetted by SOF troops, were outnumbered by the Taliban 5,000



F-16s on a flight during Red Flag at Nellis AFB, Nev. Air-to-air combat skills atrophied after Vietnam. It took ambitious training exercises, such as Red Flag, to restore fighter pilot skills in air-to-air fighting.

USAF photo by TSgt. David Salanitri

to 2,000 at Mazar-e-Sharif, for example, they had airpower behind them, with targets called in and directed by SOF. Airpower proved the great equalizer.

RENDERED INEFFECTIVE

The same proved true in Iraq. Airpower reduced the Iraqi Al Nida Republican Guard Division—originally numbering 13,000 men and 500 vehicles—to 2,000 troops and 50 vehicles by the time US marines engaged it. Similarly, air strikes cut the Hammurabi Division to 44 percent effectiveness and the Medina Division to only 18 percent before they were engaged by coalition ground troops.

One US Army brigade commander, Col. William F. Grimsley, later said: “We never really found any cohesive unit of any brigade of any Republican Guard division.” As in Desert Storm, the bulk of the Iraqi army was rendered combat ineffective by airpower. One report states that up to 90 percent of the Iraqi army in some units deserted in 2003, driven away by the air strikes devastating their units.

The Air Force’s post-Desert Storm lessons learned report—the *Gulf War Airpower Survey*—rendered all these statistics and many more for future commanders to consider, creating a template for future analysis of how the US fights. Desert Storm showed the value

of stealth, for example, an attribute of modern airpower that has been applied in every major conflict since, with great success.

Lessons learned studies in the last 20 years have homed in on a few consistent points. In conflicts of choice, the US must maintain popular support both at home and abroad. Things tend to go badly when intervention costs a great deal of money or lives or produces widespread destruction in countries the US is trying to help.

In short, to best achieve its goals, the US must limit cost and risk, not only to itself, but also to its adversaries—and especially to the indigenous populations. The insertion of large numbers of ground troops greatly increases US risk while simultaneously incurring huge cost and—paradoxically—may lower the odds of success. US military experience since World War II has made these facts available.

It is time to reorient US military policy away from the use of conventional ground forces and toward more reliance on airpower (land- and sea-based) SOF, indigenous ground troops, and robust ISR. The old and traditional methods of war have not worked. It’s time to change.

This is the lesson that should be learned from modern conflict. ★

Phillip S. Meilinger is a retired Air Force colonel and command pilot, with a Ph.D. in military history. His latest book is *Limiting Risk in War: Second Fronts, Asymmetries, and Airpower*. He has contributed frequently to *Air Force Magazine*. His most recent article, “Supremacy in the Skies,” appeared in February 2016.

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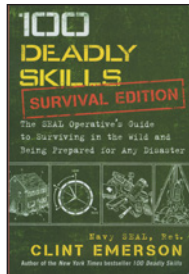
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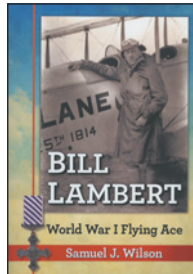




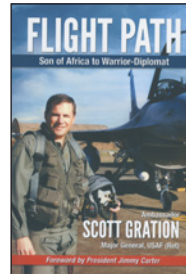
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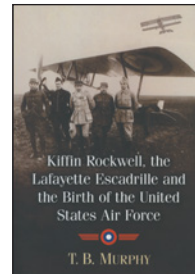
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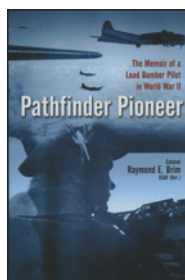
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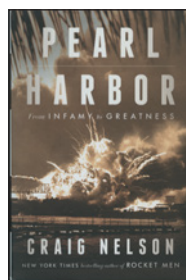
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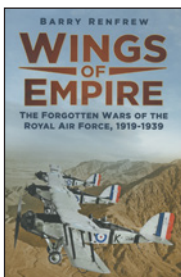
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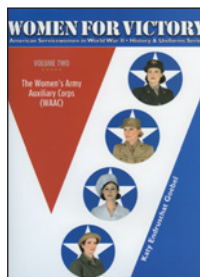
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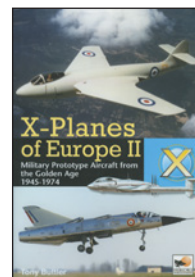
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Wings of Empire: The Forgotten Wars of the Royal Air Force, 1919-1939. Barry Renfrew. Order from: Independent Publishers Group, Chicago (800-888-4741). 288 pages. \$47.95.



Women For Victory: American Servicewomen in World War II History & Uniform Series, Vol. 2. Katy Endruschat Goebel. Schiffer Publishing, Atglen, PA (610-593-1777). 336 pages. \$89.99.



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Zones of Control: Perspectives on Wargaming. Pat Harrigan and Matthew G. Kirschenbaum, eds. The MIT Press, Cambridge, MA (800-405-1619). 806 pages. \$50.00.



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I Can Do This

A memorial to military women highlights their service.

By Beth Liehti Johnson

Women's Army Corps Sgt. Esther M. Blake enlisted in the Air Force as soon she could: just after the clock struck midnight, on July 8, 1948.

That was almost a year after USAF became an independent service but the first moment women were authorized as regular members of the armed forces.

Blake had originally enlisted to free up a soldier to fight, saying, "If I can do this, my efforts will be worthwhile."

NUMBERING 2.5 MILLION

The Women in Military Service for America Memorial preserves—and continues to seek out—stories like this.

The memorial is located in the historic hemicycle edifice (built in 1932 and refurbished in the 1990s) at the entrance to Arlington National Cemetery in Arlington, Va.

The Women in Military Service for America nonprofit foundation that manages The Women's Memorial—to use its shorthand name—salutes more than 2.5 million women who have served in the armed forces, going back to the American Revolution.

FOR THE RECORD

The heart of the memorial is its registry, a computerized database and historical record of women veterans who have recorded their experience in their own words. The registry contains entries for more than 260,000 women.

Over 46,500 of them (almost 18 percent) served in the Total Air Force, according to retired Army Lt. Col. Marilla Cushman, the foundation's director of public relations, and Britta Granrud, curator of collections.

The collection contains 1,100 oral histories.

Granrud especially encourages women who served in Iraq and Afghanistan to tell their stories because they have performed Air Force duties never before undertaken by women. Capturing these experiences adds to the repository documenting women's contributions to US military history.

"What we don't record, we lose," The Women's Memorial officials like to say.

IN THE ARCHIVE

The archive contains more than 5,800 artifacts, from the American Revolution to the Global War on Terror. Items donated include photographs, documents (journals and diaries), uniforms, personal items, medals, insignia, and unit patches.

Demonstrating the value and significance of this collection, some items are on loan to other museums, including the National Museum of American History, the new National Museum of African American History and Culture, and the National Civil Rights Museum in Memphis, Tenn.

The memorial's staff often receives queries from authors, scholars, artists,

The Women in Military Service for America Memorial is the only major national memorial of its kind. It also honors women who served in the Merchant Marine, NOAA, the US Public Health Service, and other organizations.

filmmakers, and the media for information about women in the military.

Families have contacted the staff to confirm a woman veteran's service. In several instances, the staff has been able to confirm eligibility for burial and memorial-service benefits, based on information the veteran provided in her registration, such as service number or discharge papers.

Several AFA members have an active role in The Women's Memorial, including retired Brig. Gen. Wilma L. Vaught, a Donald W. Steele Sr. Memorial Chapter member, who has shepherded the memorial since 1985; the foundation's board chairman, retired Brig. Gen. Eden J. Murrie of the Gen. Dan F. Callahan Chapter; and retired Brig. Gen. Barbara A. Goodwin, foundation secretary and a Gen. Charles A. Gabriel Chapter member.

This year, the Women in Military Service for America memorial will celebrate its 20th anniversary. Its website is at womensmemorial.org. ★

Retired Col. Beth Liehti Johnson, US Army, is a charter member of The Women's Memorial.

By Joseph Bisognano

Top 5 + One: TSgt. Mark Giromini, SrA. Aaron Stande, TSgt. Harvey Holloway, guest speaker Maj. Gen. Kimberly Crider, SMSgt. Charles Carlin, and SSgt. Shane Coakley (left to right).

Massachusetts honors its

Top 5.

Photo by Joe Bisognano

Best in the Bay State

Massachusetts has its own version of AFA's Outstanding Airmen of the Year program.

It's called the Top 5 Massachusetts Airmen.

The state's AFA organization and its Minuteman Chapter created the recognition program some three years ago.

They most recently honored the Bay State's five outstanding airmen last fall at a second annual awards dinner. It took place at the USS Constitution Museum in the Charlestown Navy Yard, Mass., right next to the landmark US Navy frigate nicknamed "Old Ironsides."

THE TOP FIVE

The Air Force in Massachusetts includes approximately 11,000 people assigned to four primary installations. The Minuteman Chapter and its president, Yvonne Thurston, worked closely with all of the state's wing and group commanders to find nominees who were the best in job performance and in the local community. Here are the Top 5 selected:

■ SMSgt. Charles Carlin is the superintendent of Logistics Plans/Deployment and Distribution, 439th Logistics

Readiness Squadron, Westover ARB. He managed a first-ever beddown, of more than 130 Pakistani air force personnel, plus nine aircraft.

■ TSgt. Harvey W. Holloway is the noncommissioned officer in charge for training, 66th Security Forces Squadron, Hanscom AFB. He headed several initiatives to handle active-shooter situations and prepared security forces for an Operation Inherent Resolve mission surge.

■ TSgt. Mark A. Giromini is an aircrew flight equipment craftsman, 104th Operations Group, Barnes Arpt. He deployed to Al Jaber, Kuwait, to aid Michigan's Selfridge Air National Guard personnel. (See "A Century of Action," p. 46.) Giromini supported 10 combat sorties a day.

■ SSgt. Shane T. Coakley is a security forces journeyman, 104th Security Forces Squadron, Barnes Arpt. He deployed to Kandahar Airfield, Afghanistan, for Operation Enduring Freedom and Operation Freedom's Sentinel. He stood up the Security Forces Unit Control Center for Kandahar indirect fire attacks and implemented anti-terrorism measures.

■ SrA. Aaron J. Stande is an aerospace medical technician, 102nd Medical Group, 102nd Intelligence Wing, Otis ANGB. In Ghana he supported a disaster preparedness initiative in Accra, teaching first responder courses. In Kenya, he was attached to the medical outreach team on an African Partnership Flight.

THEY REFLECT THE BEST

Approximately 135 people attended the awards dinner.

Maj. Gen. Kimberly A. Crider, the mobilization assistant to Undersecretary of the Air Force Lisa S. Disbrow, was keynote speaker. Crider described the accomplishments of each Top 5 airman and how their skills contributed to the Total Force concept of a shared mission between the components.

Massachusetts AFA and its 1,500 members were proud to recognize the contributions of these airmen who reflect not just the best in the state, but the best of the Air Force. ★

Joseph Bisognano is Massachusetts state president and a member of the Minuteman Chapter.

CHAPTER NEWS

By June L. Kim, Associate Editor

LONG ISLAND CHAPTER

The Long Island Chapter (N.Y.) marked the 75th anniversary of the Japanese attack at Pearl Harbor by dedicating a three-panel plaque during its annual “Dropping of the Roses” ceremony in Farmingdale, N.Y., in December.

Chapter President Fred DiFabio organized the event held at the American Airpower Museum and nearly 300 people attended, said William G. Stratemeier Jr., chapter VP for leadership development.

Among the crowd were Pearl Harbor survivors Gerard Barbosa and Seymour Blutt, New York state officials, military officers, representatives from military organizations, and AFA Northeast Region President Maxine Rauch.

In previous years, a pilot dropped red roses—and more recently, one white rose for 9/11—around the Statue of Liberty in New York Harbor at 12:55 p.m. (the exact East Coast time of the attack) on Dec. 7, but due to inclement weather, the actual dropping of the roses took place the following day.

At the end of the ceremony, Rauch presented DiFabio with an AFA Exceptional Service Award for 2016, said Stratemeier.

Photo courtesy of Bill Stratemeier



Former and current military officials salute during the Long Island Chapter's Dropping of the Roses ceremony in December. Chapter President Fred DiFabio is at left and Chapter Treasurer William Stratemeier is at right.

SALT LAKE CITY CHAPTER

Members of the Salt Lake Chapter (Utah) had the privilege of sending off local Gold Star children at the Salt Lake City Airport in December. The chapter partnered with Snowball Express, a nonprofit organization that serves families of fallen American soldiers, to greet them as they flew to Dallas for a retreat, said Robert George, Rocky Mountain Region president.

Chapter President Edward Felleson coordinated the event along with Chapter VP John Wagoner and Aerospace Education VP Patti White, arranging times, security passes, and parking passes with airport police, said George.

The chapter purchased 100 teddy bears so that the children could have “something to take with them on the flight,” he said. Felleson asked members of the Utah Air National Guard and Army National Guard to present the teddy bears on AFA's behalf, while AFA members distributed copies of *Air Force Magazine* to the chaperones of the flight.

Felleson learned about the opportunity when his friend, American Airlines employee Carl Sonderstrom, asked if the chapter would be interested in participating.

GOLD COAST CHAPTER

The Gold Coast Chapter in Florida hosted an open house last fall for members new and old, said Chapter President Virginia Montalvo.

Held at a local flying school at Pompano Beach Airpark in Pompano, Fla., the gathering of more than a dozen and a half listened to chapter member Milton Markowitz speak about his experiences flying 40 different aircraft throughout World War II, Korea, and Vietnam. “The younger members listened intently,” said Montalvo. “They ... were not disappointed.”

The chapter even donated a mini drone as a door prize, said Montalvo. The drone was suggested by chapter VP of aerospace Virginia Knudsen, who is a science, technology, engineering, and math teacher at Parkway Middle School of the Arts in Lauderhill.

Chapter VP for Membership Bob Morris provided refreshments.

Martin H. Harris, 1932-2016

Former AFA Board Chairman retired Col. Martin H. Harris died Dec. 9. He was 84 years old and resided in Longwood, Fla.

Harris was born in Brooklyn, N.Y., and after graduating from New York University joined the Air Force. He retired from the Air Force Reserve. He worked for Lockheed Martin for 40 years before retiring in 1997.

Harris had served as AFA's Chairman of the Board (1986-88), National President, and



National Secretary (1972-76). He was Florida's first AFA state president and chapter president. He also served as vice president and a trustee of the Aerospace Education Foundation and was instrumental in getting the Air Force Memorial constructed without using public funds.

He was named AFA Member of the Year for 1972 and was awarded the Exceptional Service Award by the Secretary of the Air Force.

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AFA Emerging Leader

Christopher J. Hinds

Home State: Wisconsin

Chapter: Thunderbird Chapter (Nev.)

Joined AFA: 2013

AFA Office: Past member, AFA e-Membership committee

Military Service: 2002-current, Active Duty

Occupation: Security forces

Education: A.A.S., Criminal Justice, Community College of the Air Force; A.A.S., Instructor of Technology and Military Science, Community College of the Air Force

How did you first hear of AFA?

In 2013 while I was stationed at JBSA-Lackland [Texas]. CMSgt. [Kathleen M.] McCool, [one of the Air Force's 12 Outstanding Airmen of the Year in 2011] had put out an all-call for motivated individuals who wanted to be part of AFA and help stand up the first AFA e-sub council.

What do you enjoy about AFA membership?

All the knowledge that is out there in AFA. It is such a diversified group with a wealth of knowledge and experience, I honestly learn something new every time we meet. It has also given me the opportunity to lead and be part of something much bigger than [myself].



Photo by Susan Hinds for Purest Light Photography

Chris Hinds trains Pprada, a military working dog, at Nellis AFB, Nev., in January 2017. Hinds is the NCOIC of the military working dog section.

How can AFA create more awareness about what it does for airmen and their families?

We could bring the information from the chapter meetings to the base and get more of the younger enlisted involved without the hassle of having them trying to get off work or find a ride to the chapter meeting. ... There is so much that AFA fights for and does for the Air Force family, but it always seems to go unrecognized. I believe that putting ourselves out there, educating, advocating, and supporting, we will be able to grow our numbers and support for the organization.



MAXWELL

Death in Manila

On April 6, 1917, the US entered the Great War. It was a matter of instant significance for William C. Maxwell, an obscure student at the University of Alabama. His response would, over time, make his name famous throughout the Air Force.

Maxwell was born into humble circumstances in tiny Natchez, Ala., one of seven children. Their father, John R. Maxwell, and mother, Jennie, moved the family to Atmore, where he grew up.

Maxwell, 24 when war came, was older than the usual undergraduate. He possibly began college late because he lacked the money. When he did arrive in Tuscaloosa, he enrolled as a Reserve Officer's Training Corps student, tuition paid by Uncle Sam.

For Maxwell, however, the war meant college days were over. He abruptly left campus and joined the Army in 1917.

Maxwell wanted to be a military pilot. He was selected for flight school and was sent to Kelly Field, Texas. In April 1918, with his training completed, he was commissioned as a second lieutenant in the Air Service and received his wings.

World War I ended before he could get to it. Maxwell's military flying career continued apace.

In 1919, he was assigned to the 3rd Aero Squadron, which the peacetime Air Service was transferring to the Philippines. Elements arrived in Manila in August 1919 and organized at Fort Stotsenburg.

Soon, Maxwell was generating sorties from a new, air-only section of Stotsenburg: Clark Field. The young aviator was flying the Dayton-Wright DH-4 biplane, a US version of Geoffrey de Havilland's famous two-seat, single-engine British bomber.

On Aug. 12, 1920, disaster struck. Maxwell was on a routine flight when he experienced engine trouble. The 400-hp Liberty engine was usually reliable. On this day, it was not.

Maxwell attempted an emergency landing in a nearby sugarcane field. On approach, losing altitude, he saw that a group of children was playing in a clearing directly in his path. He swerved away and maneuvered into the field.

Hidden in the tall sugarcane, however, was a large flagpole stanchion, and the DH-4 slammed into it. Maxwell died instantly.

He was laid to rest in Robinsonville Baptist Church Cemetery in Atmore, 100 miles from the Montgomery Air Intermediate Depot. At the suggestion of Maxwell's former commander, Maj. Roy C. Brown, the depot was on Nov. 8, 1922, renamed Maxwell Field. Maxwell Air Force Base today is one of USAF's most recognizable names.

The base has a rich history of its own, being one of the world's earliest flying schools (established by the Wright brothers) and site of the famous Air Corps Tactical School in the Air Force's early days.

Today, Maxwell AFB is home to Air University, USAF's premier center for airpower studies, and associated organizations.

WILLIAM CALVIN MAXWELL

Born: Nov. 9, 1892, Natchez, Ala.

Died: Aug. 12, 1920, Manila, Philippines

Occupation: US military officer

Service: ROTC; US Air Service

Era: World War I/post-WW I

Years of Service: 1917-20

Grade: Second Lieutenant

Combat: None

College: University of Alabama

MAXWELL AIR FORCE BASE

State: Alabama

Nearest City: Montgomery

Area: 6.4 sq mi / 4,100 acres

Status: Open, active

Opened: (by Army) April 1918

Original Name: Wright Field

Renamed: Engine and Repair Depot (April 1918)

Renamed: Engine and Plane Repair Depot #3 (September 1918)

Renamed: Aviation Repair Depot (March 1919)

Renamed: Montgomery Air Intermediate Depot (January 1921)

Renamed: Maxwell Field (Nov. 8, 1922)

Named as AFB: September 1947

Former Owner: US Army

Current Owner: AETC

Home Of: Air University

1. Second Lieutenant William Maxwell, a native of Atmore, Ala., for whom Maxwell Air Force Base is named. Unknown date. 2. Maxwell with a Curtiss Jenny. 3. The Air Corps Tactical School, then located at Maxwell Field. 4. Air University today.



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