

Defense Systems DIGEST

2 JULY 2019 – THE LATEST FROM DEFENSE SYSTEMS INFORMATION ANALYSIS CENTER



NOTABLE TECHNICAL INQUIRY

What unclassified technical information is available on a foreign mortar weapon?

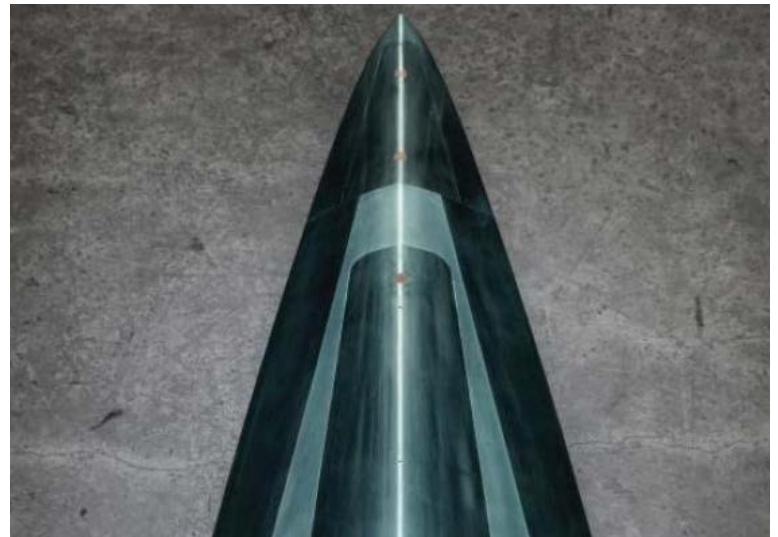
DSIAC was asked to compile technical information on the Bosnian 82-mm mortar produced by Bosnia-Novitracva—specifically, unclassified studies on materials specifications, operating pressures, ballistic pressures, and ammo types and specifications. DSIAC first searched the DTIC R&E Gateway and delivered a six-document bibliography to the inquirer, along with a U.S. Army Test... [Read More](#)

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FEATURED NEWS

Hypersonic Missiles Are Unstoppable. And They're Starting a New Global Arms Race.

On March 6, 2018, the grand ballroom at the Sphinx Club in Washington was packed with aerospace-industry executives waiting to hear from Michael D. Griffin. Weeks earlier, Secretary of Defense James Mattis named the 69-year-old Maryland native the Pentagon's Under Secretary for Research and Engineering, a job that comes with an annual budget of more than \$17 billion. The dark-suited attendees at the McAleese/Credit Suisse Defense Programs Conference were eager to learn what type of work he would favor.



The audience was already familiar with Griffin, an unabashed defender of American military and political supremacy who has bragged about being labeled an “unreconstructed cold warrior.” With five master's degrees and a doctorate in aerospace engineering, he was the Chief Technology Officer for President Reagan's Strategic Defense Initiative (popularly known as Star Wars), which was supposed to shield the United States against a potential Russian attack by ballistic missiles looping over the North Pole. Over the course of his career that followed, he wrote a book on space vehicle... [Read More](#)

VOICE FROM THE COMMUNITY



Dr. Amanda Schrand, Team Lead, Resilient Hybrid Electronics, U.S. Air Force Research Laboratory Munitions Directorate

I am a multidisciplinary science and technology leader in the U.S. Department of Defense (DoD). Our cross-service (Air Force, Army, and Navy) research team is currently exploiting innovative ways to use additive manufacturing to address the harsh shock/vibration environment presented to defense electronics. We are developing world-class, multimaterial, advanced manufacturing facilities and partnerships that will transform the U.S. capabilities to dominate time, space, and complexity in future conflict.

► Apply to be part of our network of over 1,000 subject matter experts.

UPCOMING EVENTS

sUAS-EOTACS Payloads

24 July 2019

2019 Propulsion Energy Forum

19 August 2019 to 22 August 2019

2019 Air, Space, & Cyber Conference

16 September 2019 to 18 September 2019

22nd Annual Systems and Mission Engineering Conference

21 October 2019 to 24 October 2019

► Want your event listed here? Let us know!

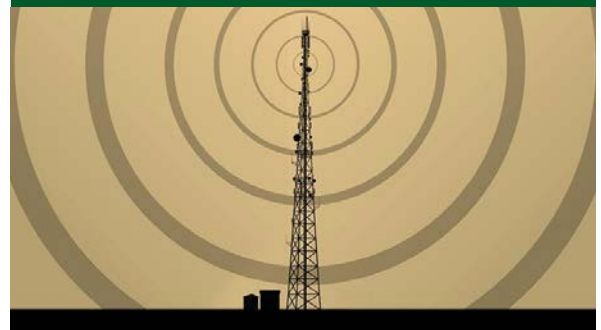
R&E GATEWAY

The screenshot shows the R&E Gateway website interface. At the top, there are logos for the Department of Defense and the R&E Gateway itself, with the tagline "PRESERVING KNOWLEDGE CONNECTING PEOPLE INSPIRING INNOVATION". Below the logos, the text reads "Welcome to the DoD's authoritative source for scientific and technical (S&T) information!". A search bar is prominently displayed with the text "Search Over 4 Million Records Including Technical" and a "Search" button.

Check out the newly redesigned DTIC R&E Gateway!

To view, visit: <https://dtic.mil>

DSIAC JOURNAL SPRING 2019



Microdiode Lasers: A Safer Alternative for Electrically-Fired Energetic Devices

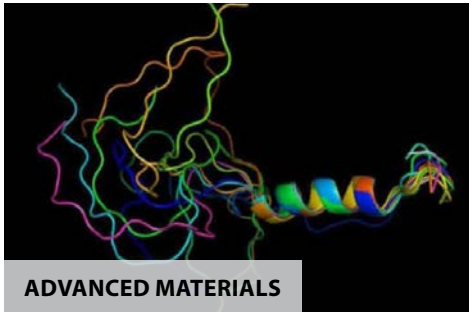
Also in This Issue:

- A Titanium-Based Igniter System for Hand-Grenade Fuzes
- Laser Power Beaming
- Random Error in Small-Caliber Dispersion
- Additive Manufacturing for Aerospace Maintenance and Sustainment



► Have an idea for a topic? Please contact us to write an article!

RECENT NEWS



ADVANCED MATERIALS

Researchers Can Now Predict Properties of Disordered Polymers



AUTONOMOUS SYSTEMS

Air Force's Future Stealthy Combat Drone Could Use AI to Learn



DIRECTED ENERGY

USAF Directed-Energy Weapon "THOR" Can Down Swarms of Drones Simultaneously



ENERGETICS

SpaceX Set to Launch Defense Department Space Experiments On Board Florida Falcon Heavy



MILITARY SENSING

Sailors Get a Firsthand Look at the Navy's New SPY-6 Radar System



NON-LETHAL WEAPONS

Here's How the Army Wants to Stop Bad Guys Without Killing Them



RMQSI

Pentagon, Lockheed Martin Failed to Ensure Proper Parts for F-35



SURVIVABILITY AND VULNERABILITY

Nearly 40 Percent Lighter Body Armor Coming to Marines in 2020



WEAPON SYSTEMS

SOCOM Wants a New Armor-Piercing Sniper Bullet. Here's One Option Engineers Are Developing



FROM THE BONEYARD TO THE TEST PAD: A SUPER HORNET TEST ARTICLE FINDS NEW LIFE AFTER 20 YEARS OF RETIREMENT



article identified for the Super Hornet Live Fire Test (LFT) program has been extending all the way from its use in the FA-18 E/F development in the mid-1980s to its current use in the FA-18 Block III episode in 2019. In all, the fighter jet has stood the test of time—as well as its share of fire—for more

FROM DT50 TO ST56

As with most aircraft test programs, the use of test articles is critical in shaping various aspects of the program. For both ground and flight testing, the number of available aircraft often dictates the volume and pace of test activities, and each article often must fill several roles. The Super Hornet test article discussed here, which was the third production FA-18E engineering and manufacturing development (EADM) aircraft, was no exception. Designated as a ground test article, the fighter jet was initially configured for test use as the full-scale aircraft (FS) test article, with the designation DT50. Then, after a series of revisions and successful drop tests, the Ground Engagements (GE) program personnel recognized the aircraft to fulfill its secondary role as the Strikeback Engagements Test article, with the designation ST56.

In September 1997, during one of the Strikeback engagement events, ST56 ended up on its back in the woods (see Figure 2). Ground Air Warfare Center Program Director (DAWG) and Boeing IT personnel were sent to assess the damage and determine if the remaining structure would still be a viable LFT test article. They found that the starboard side of the aircraft was in generally good shape. The left control surface was bent, and the fuselage was buckled as a result of landing into the woods. The team concluded, however, that the aircraft would be used for LFT if certain repairs were made to the aircraft and if some of the planned testing was relocated from the starboard side to the port side of the aircraft.

Accordingly, the FA-18E was shipped back to the Boeing facility in St. Louis, was repaired, and was configured to



Figure 1: The Evolution of the FA-18E Test Article



Figure 2: The Test Article After Strikeback Engagements Testing

most major primary LFT requirements. In particular:

- All flight control surfaces were packed and installed, except the right-hand horizontal stabilizer and the right-hand vertical stabilizer.
- All structural and nonstructural damage and fatigue were repaired.
- Fuel and hydraulic quantities integral to the wing were installed.
- Wing integral fuel tank shutoff explosion suppression fuse was installed.
- The rocket fuel tank Damage Control System (DSCS) forward lock (overriding mechanism) was installed between fuel tanks 3 and 4 and the fuel tank 4 tank.
- All fuel cells and related components were installed.

The fuselage system was installed in the applicable bays.

An operating F4U engine was installed (for some tests).

THE ABUSE CONTINUES

With some life—as well as a new designation of ST56—granted to the test article, the aircraft was delivered to NORTOP in China Lake, CA, in May 1998 for full-scale LFT (see Figure 3). And, in compliance with the LFT law, that began yet another phase of “test and abuse” in the FA-18E’s history. In fact, of the more than 200 ballistic shots conducted for the LFT program, nearly 30 ballistic tests were conducted on ST56, with threats ranging from missile warhead fragments to armor-piercing (AP) and high-explosive (HE) munitions.

Summer 2019 Aircraft Survivability Journal

The 2019 summer issue of the Aircraft Survivability Journal is now available online! Read or download it at <http://jasp-online.org/asjournal/>

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