

# Artillery charges improved at U.S. Army Yuma Proving Ground

#### By Mark Schauer

The intelligent use of artillery has proved a decisive factor in battle after battle, cannons having the ability to rain devastating, accurate fire on enemy troop concentrations.

As artillery technology evolved across previous decades, U.S. Army Yuma Proving Ground (YPG) was on the cutting-edge testing guided and semi-guided munitions capable of hitting within mere meters of a target kilometers away.

In recent decades, one of the innovations tested here was the Modular Artillery Charge System (MACS) that serves as the propelling charges for 155 mm artillery rounds. MACS consists of two types of propelling charges. The M231 is the low-zone component fired



Whenever the United States military fires an artillery round, the reliability of that round was meticulously proven at Yuma Proving Ground (YPG) long before making it into the hands of Soldiers. YPG's ammunition plant has been instrumental in building multiple experimental formulations, shapes, and configurations to update the Modular Artillery Charge System that serves as the propelling charges for 155 mm artillery rounds. (Photo by Mark Schauer)

either singly or in pairs for shorter ranges, and the M232 is the highzone component fired in multiples of three-to-five for extended ranges. MACS was developed in the early 2000s as a compliment to the Crusader self-propelled howitzer. MACS was necessary to accommodate the platform's ammunition autoloader.

"Prior to that, the propelling charges in use by the Army were bag-based," said Steve Flores, YPG Long Range Precision Fires Cross Functional Team Integrator. "They weren't very rigid or conducive to putting into an ammunition handling system. The designers made sure the new charges were still compatible

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# Yuma Test Center Employees of the Quarter

- Mission Support -

Name: Peter Lariviere Years of service: 8 Job title: Operations Research Analyst, Engineering Support Branch, Instrumentation Division **Recognition:** Supporting the Engineering Support Branch by developing and evaluating software applications to improve the data processing operations and contributing to the Yuma Proving Ground Data Literacy 101 class.

**Reaction:** "I wasn't expecting it. I didn't know anything was going on today. I was surprised."



Yuma Test Center Commander Lt. Col. Kevin Hicks presented Peter Lariviere with a Civilian Service Achievement Medal on June 18 for his selection as the Yuma Test Center, Mission Support Employee of Quarter. (Photos by Ana Henderson)

#### Name: Quentin Sorenson Years of service: 18 (civilian and contractor) Job title: Test Officer in the Munitions and Weapons Division

**Recognition:** Leading the Modular Artillery Charge System Modernization test Reaction: "Total surprise. I am just doing my job trying to make sure that things happen. I have to offer a lot of thanks to the support that's out there covering for me as I scrambled, made mistakes and muddled through. This is for everybody out there that helped me all those months and weeks."

– Mission —





Yuma Test Center Commander Lt. Col. Kevin Hicks presented Quentin Sorenson with a Civilian Service Achievement Medal July 1 for his selection as the Yuma Test Center, Mission Employee of Ouarter. (Photos by Ana Henderson)

# The Outpost

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A new shipment of weight machines arrives at Yuma Proving Ground's Fitness Center on June 24, replacing outdated machines in the center's weight room. (Photos by Elisa Reitman)

### YPG's fitness center gets an upgrade

#### **By Elisa Reitman**

From cardio to aerobics, basketball to volleyball, or boxing to weights there is always something to do at Yuma Proving Ground's (YPG) Fitness Center.

Now, the facility is giving YPG "gym rats" an upgrade of better equipment to work out with.

The YPG Fire Department and Department of Public Works helped the fitness center carry outdated equipment to make way for newer weight machines. The first shipment is already residing within the center, featuring seven new weight machines for use.

"With this shipment everything is being replaced one for one," said Dani Compton, YPG Fitness Center Manager. "The second shipment will have a couple of new pieces we don't have in this gym, which are kind of new and popular pieces in most gyms. I wanted to make sure we got it here to keep up with current workout trends."

Excitement filled the room with the staff watching the equipment offload out of the truck, comparing it to getting "a new Amazon package." Excitement is not the only reason YPG's Fitness Center is upgrading its equipment.

"Our purpose is to keep Soldiers ready," said Compton. "Whether it's because they're here for training, here for the free fall school, they all come from deployable units. So, being able to support them while they're here, whether it's two years that they're out here or 30 days that they're in a course, our whole purpose for being here is to support their readiness."

You can keep up with current updates from the YPG Fitness Center on its Facebook, 'Yuma Proving Ground Family and MWR.' Alternatively, for more information on what the Fitness Center offers call 928-328-2400.

### YPG Fitness Center promotes the grind with 1000 lb Club



Shauna Wells and Will Sanchez both hit their goals at Yuma Proving Ground's Fitness Center, becoming 1000 lb Club members. Anyone who has any interest in joining the club must lift the accumulative requirements set by the Fitness Center (500 lbs or above for women, and 750 lbs or above for men) with three types of lifts: squat lift, deadlift, and bench press. Any questions can be directed to the Fitness Center by reaching out to its phone number 928-328-2400. (Photos courtesy of Fitness Center)

Data is in a very real sense the chief product of test centers within the Army Test and Evaluation Command (ATEC).

U.S. Army Yuma Proving Ground (YPG) has been at the forefront of developing the local architecture and establishing data governance for practical use cases for artificial intelligence (AI) in support of the post's test mission.

From vision-based AI learning to automating Kineto Tracking Mount-calibration processes, YPG is already reaping dividends from the most recent technology, and more benefits are expected as the impact of the efficiency gains continues. To facilitate this, YPG has pioneered an introductory course in data management that recently graduated its second cohort.

Whether data from tests of military equipment or business data like equipment lifecycles and utilization rates, the ability to read, analyze, and communicate with data in a critical way is vital for YPG's operations.

"The folks are taking away the framework of what data literacy is," said Richard Hernandez, YPG's Chief Data Officer. "Hopefully





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they can take it and apply it to their daily operations and have enough information and the right context to move forward with data problems they encounter."

People taking the class ran the gamut from engineers and data scientists to Operations Research Analysts. Spanning two full workdays, the course gives an overview of the Army's overall digital modernization efforts and the ATEC data mesh before exploring practical use cases that occurred locally at YPG. Some of the course's instructors attended an Army-wide data management class at West Point early this year, then made substantial modifications to discuss practical application of the precepts relevant to YPG's specialized mission. In small group exercises during the two-day course, each group was encouraged to pursue problems relevant to their individual jobs and commodity areas.

"We want them to drive their own

exercises in the sense of defining their own data set," said Hernandez. "It helps them relate to the material and think about how their challenges can be approached using the concepts outlined in the course."

Students in the class came from a wide variety of commodity areas, and found the exercises fruitful.

"We've been going over statistical analysis and how it relates to our test mission areas," said Rob Fillinger, a test officer in the Ground Combat Division. "We also talked about artificial intelligence and machine learning to streamline those processes even further. I think it's going to be useful for us."

The course will run monthly for the next few months but may become quarterly based on enrollment.

"We'll continuously tailor content in future iterations of the course to make sure we're hitting the points folks are asking us to outline for them," said Hernandez.

# Garrison employees recognized

U.S. Army Yuma Proving Ground Garrison Manager Kenneth Musselwhite recently presented Civilian Service Achievement Medals to the following employees. (Photos by Mark Schauer)



Mariah Boykin Family Advocacy Program Manager



Michael Jonez Engineering Technician



James Rochester Supervisory Security Officer



Janae Espinoza Human Resources Specialist



Vincent Ricci Lead Police Officer

Garrison Professional of the first Quarter



Brian Brown Management Analyst

### **YTC Commander recognizes employee accomplishments**

Munitions and Weapons Division —





U.S. Army Yuma Test Center Commander Lt. Col. Kevin Hicks presented Office Support Assistant Fatima Mezquita- Megui a command certificate of appreciation for her support of this year's Range Commanders Council hosted at Yuma Proving Ground. He also saluted Munitions and Weapons Division test Officers Richard Bloomfield and Chris Tennant for 15 years of service. (Photos by Mark Schauer)



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### Instrumentation Division —



Yuma Test Center Commander Lt. Col. Kevin Hicks awarded Charity Garber and Herb Kiser with Commander's Coins. The award citation recognized Garber for her "professionalism, knowledge, dedication, and commitment" while working on a test program. The award recognized Kiser for serving as the Range Manager for Instrumentation Range Support Program where his, "diligent efforts" resulted in cost savings. (Photos by Ana Henderson)





The U.S. Army Test and Evaluation Command awarded Yuma Test Center's Flight Services Division an Award of Accomplishment in Safety. The award from the Department of the Army's U.S. Army Safety Program recognizes the division for its top-notch safety during the last 12 months. Maintainers, pictured, are entrusted to keep aircrafts ready for flights. (Photos by Ana Henderson)

# Keeping safe in the skies: YTC's Flight Services Division earns recognition for safety

#### By Ana Henderson

The U.S. Army Test and Evaluation Command (ATEC) awarded Yuma Test Center's (YTC) Flight Services Division an Award of Accomplishment in Safety.

The award from the Department of the Army's U.S. Army Safety Program signed by ATEC Commander Maj. Gen. Patrick Gaydon recognizes the division for its top-notch safety during the last 12 months.

The team conducted missions without any Class A, B or C mishaps. These classes encompass property damage up to 2-million dollars and injuries ranging from minor requiring one day off work to as severe as a fatality.

Mission Pilot Scott 'Data' Myers, a Marine/Naval Aviator veteran, says this award is a result of the entire team keeping safety at the top of their list.

"Safety is the ultimate team sport, because no one person can cover the huge number of known variables and mitigate against the unknown variables alone; there will always be unknown variables, and real-time changes that need to be made during an event, but the process of planning is vital."

The Flight Services Division is made up of pilots, an airfield manager, airfield electronics technician, airfield quality assurance inspector and equipment manager. LOGMET, LLC, the aviation services support contractor supplements their team by providing personnel for many functions including maintenance pilots, crew chiefs, air traffic control, airfield operations, production and quality control, avionics, aviation maintenance, supply, ground support equipment and aviation life support.

Engineer Technician Stuart 'Smitty' Smith, a Marine veteran who works in aviation electronics says the team's highly specialized experience in the military and aviation is a key factor.

"This place attracts folks with far reaching experience."

The seasoned pilots collectively have more than 17,300 flight hours total. The aviation service personnel experience varies from a few years to over four decades.

"Even our youngest member has



Engineer Technician Stuart 'Smitty' Smith and Mission Pilot Scott 'Data' Myers, both veterans, are two of the many who keep safety at the top of their list in the Yuma Test Center Flight Services Division.

the safety attitude engrained into them from the induction," said Smith.

In addition to experience, safety is a way of life with aircrafts. Especially in the testing world,

"We have more checks and balances on an aircraft than you would normally see," explained Smith.

Each member's work is triple checked. Providing layers of safety. The hangars are immaculate. Their maintenance workspaces organized; each tool is accounted for before and after flights and at the end of the day. Nothing is left to guesswork because they are not only responsible for multi-million-dollar items, but they are also responsible for safeguarding lives.

Myers gives one group a lot of credit, "Maintainers are a huge part of safety."

To ensure each aircraft is in tip-top shape Flight Services' maintainers perform daily preventative maintenance checks and turnaround inspections after tests. They also perform checks after logging a set amount of flight time.

"I am very appreciative of their hard work."

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with the legacy weapons systems."

Though Crusader was never fielded, the MACS endured. Since there was a difference in chamber volume and barrel length between the Crusader and legacy systems, compromises were necessary to allow for interoperability across systems. Recently, YPG has been testing improvements to the MACS system for the current generation of artillery. A common ignitor for both the M231 and M232 is also being evaluated to minimize maintenance of the weapon.

"They are reconfiguring and improving upon the charges for use in the current cannon system," said Flores. "They are improving the way it ignites for more uniformity and to mitigate breech oscillations at high zones."

Over time, un-uniform powder ignitions can leave unwanted residues in a gun barrel, and oscillations can eventually create reliability problems for a howitzer's firing mechanism.

"Another key piece of data propelling charge designers require is how the gun tube is wearing after firing the new charge," said Flores. "They need to know if it is wearing faster than with the legacy charge."

YPG's ammunition plant has been instrumental in building multiple experimental formulations, shapes, and configurations for new propelling charges

"Every time the product manager has an experiment they want to try out, all of the propelling charges and ignitors are hand assembled at the ammo plant," said Flores. "The ammo plant will assemble them to the customer's instructions in any and all combinations of things."

In test fires of the MACS, the velocity of the fired round is measured. As each round is in flight, workers back at the howitzer take readings from pressure gauges inside the gun barrel. Testers also look for residue in the gun tube, using a camera aimed at the breech during the test and physically inspecting it after the round has been fired. For these tests, however, inert rounds are fired.

"For testing propellant you don't really need the actual high explosive round, you just need something that is representative," said Flores. "We intercept empty projectile shells at the factory before they are filled with high explosive and carefully load them with wax to the exact weight of a high explosive round and put an inert fuze fabricated at YPG on it. The propellant does not know the difference between that round and an actual high explosive round."

Whenever the United States military fires an artillery round, the reliability of that round was meticulously proven at YPG long before making it into the hands of Soldiers.

"There is no other facility that is a one-stop shop, from the ammunition plant that hand-assembles these items to having ready access to all of the different cannons," said Flores. "We have experienced weapons operators, sophisticated test instrumentation and infrastructure, a large range, and specialized gun tube inspection capabilities."

### **YPG Commander talks test capabilities**



U.S. Army Yuma Proving Ground Commander Col. John Nelson gave a presentation outlining the post's world class testing capabilities at the Institute for Defense and Government Vehicle's Armored Vehicles Conference in a packed hall at the MGM Grand Detroit on June 25. With a conference theme of 'Modernizing the U.S. Armored Force for 2030 and Beyond,' Nelson discussed how Yuma Proving Ground's more than 200 miles of rugged surveyed road courses closely simulate what a Soldier might experience in a combat theater in desert, arctic, and tropical environments. (Photos by Emma Rosenzweig)





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Yuma Proving Ground (YPG) participated in a STEM project day at Woodard Jr. high on June 20. Chief Meteorologist Nickolas McColl and Metrology Branc Chief Savanna Silva presented an overview of YPG and conducted the STEM lab with the 17 students. The lab had students build a car using LEGO STEM kits and learn how to code allowing the car to move through an obstacle course. Young volunteers, Oliver and Orlando Silva, and Gavin Conley assisted teachers with helping students through the whole activity. (Photos courtesy of Patricia Conley)

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### Family Advocacy Program giving back to fathers on Father's Day

The Family Advocacy Program (FAP) sponsored a pop-up Father's Day book table at the BROC Atrium June 12. Several men were thankful for the table, with comments such as, "I'm grateful that you're doing something for Father's Day." Fathers were welcome to take informational material, notebooks and pens with the FAP resource phone number. (Photos courtesy of Mariah Boykin)



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### Army Community Services thanks volunteers for their contributions







Army Community Services hosted an award ceremony to recognize the Soldiers and civilians who have dedicated their time to help others around post. On June 11, Volunteer Coordinator Gisela Robles called up each of the volunteers to receive an award and token of appreciation. A representative from each of the volunteer locations spoke about how the volunteer's contributions made an impact. (Photos by Ana Henderson)



#### **YPG volunteers**

Adwoa Agyemang Angelizt Perez Acuna Arianna Begay Bryant Hernandez Daniel Musselwhite Darya Campagna David Quintana Hardi Patel Ian Wrigglesworth Jason Yang Jeffery Snell John Johnson Juan De La Rosa Tabitha Lefevre Martin Clark Nicholas Venus





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