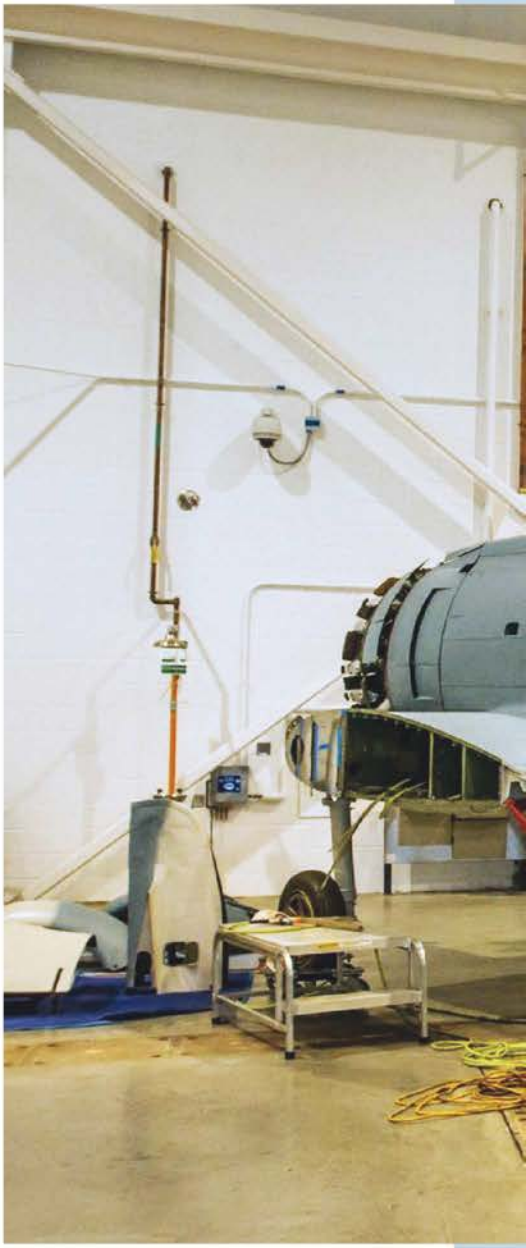
Bringing Back History

Behind the Scenes at the National Museum of the Marine Corps, Restoration Branch Breathes New Life Into Old Relics

NANCY S. LICHTMAN

LCpl Blake Burns, left, and Sgt Megan Talbott examine the wheel of a WW II-era Japanese infantry gun undergoing restoration at the Museum Support Facility in Dumfries, Va., Jan. 10. The two active-duty Marines are both assigned to the Restoration Branch staff.



By Sara W. Bock

Each year, roughly half a million visitors walk through the Leatherneck Gallery, the expansive atrium of the National Museum of the Marine Corps in Triangle, Va. Within its walls, many people find themselves transfixed by the immersive history of Marines in the air, on land and sea. Guests both young and old crane their necks to soak in the grandeur of some of the Corps' most iconic aircraft suspended motionless above the gallery, each telling a story without words. One of these aircraft, an SBD-3 Dauntless dive bomber restored to its wartime state, fuels the imagination by conjuring up visions of the frenetic skies over the Pacific during the Battle of Guadalcanal.

But what the casual observer may not consider while gazing up at the Dauntless, a stalwart aircraft that saw action for the entirety of World War II, is that they're looking at the finished product of a complete overhaul—one that took the museum's restoration team six years and 65,000 man hours to accomplish.

This particular Dauntless didn't see action during the war, but spent 50 years submerged in the waters of Lake Michigan following a 1943 training mishap. The aircraft was recovered from the lake in 1991 and became part of the collection at the National Museum of Naval Aviation, where it underwent an initial restoration process. In 2002, the Marine Corps acquired the Dauntless in an exchange agreement, and it arrived in Quantico three years later in 2005. An inspection revealed that corrosion and lake sediment rendered it structurally

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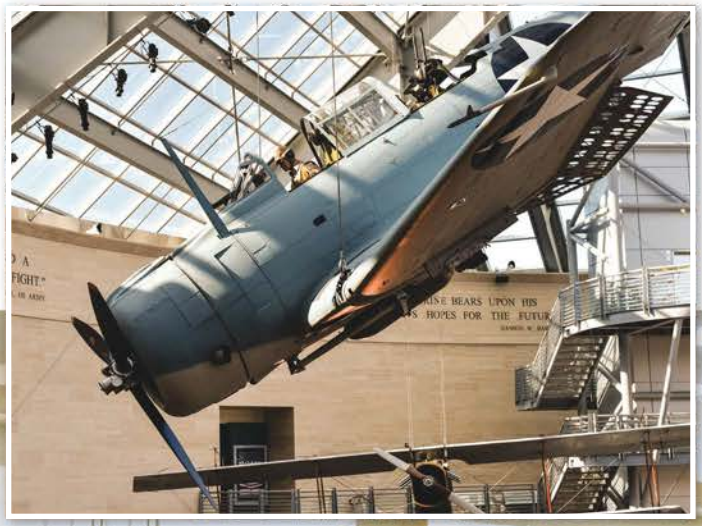


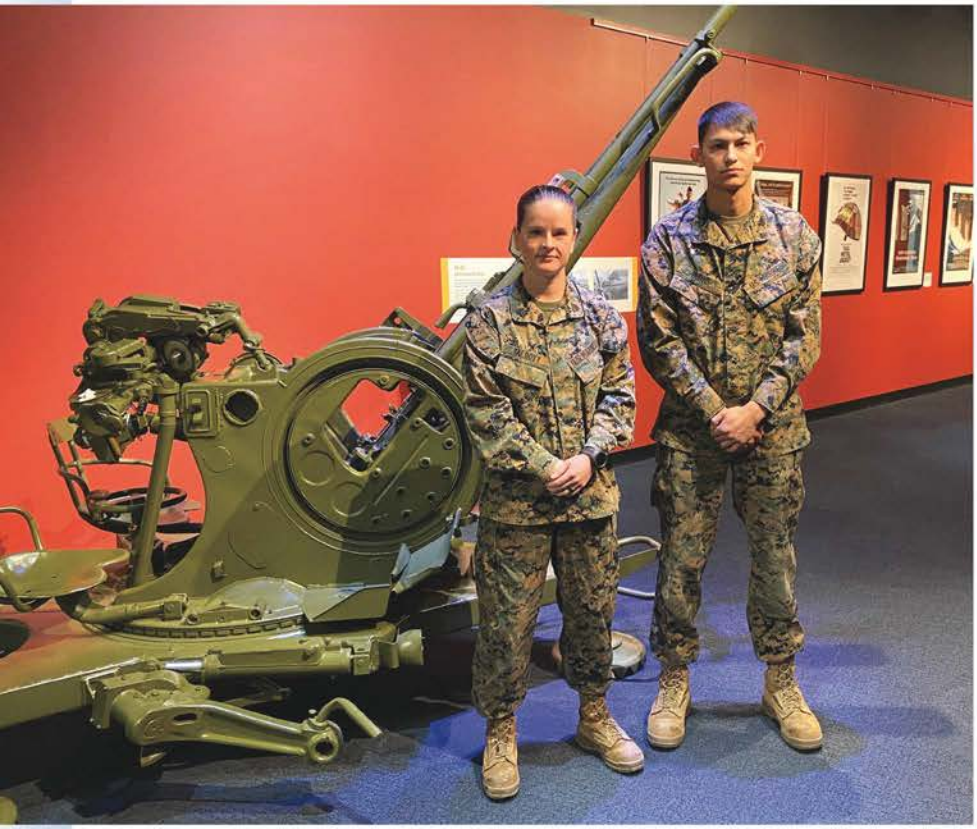
Suspended above the Leatherneck Gallery at the National Museum of the Marine Corps, an SBD-3 Dauntless dive bomber, painted in the colors of an aircraft that flew over Guadalcanal during WW II, is pictured below undergoing the final steps of restoration at the National Air & Space Museum's Udvar Hazy Center in Chantilly, Va., in December 2015. The aircraft was installed in the museum in February 2016. (Photos courtesy of National Museum of the Marine Corps)

unsound, necessitating another more extensive restoration in order for it to be suitable for suspension above the gallery.

What visitors to the Corps' world-class museum also may not realize as they explore the rest of the sprawling 120,000 square-foot facility, is that the items they see on exhibit are just the tip of the iceberg. According to Ben Kristy, the museum's collections chief, the National Museum of the Marine Corps has approximately 65,000 artifacts ranging in scale from coat buttons to 70-ton main battle tanks.

"We can display less than 10 percent of it at any one time," said Kristy, who has served on the museum staff since it opened its doors in 2006. "We don't add things to the collection lightly—we don't dispose of things lightly. It's a long process and a lot of intellectual work goes into that."

While many of the museum's artifacts are currently out on loan to other museums and installations, the bulk of its collection is housed off-site. At one point, said Kristy, the collection was stored across seven different buildings around Quantico—most of which were



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Sgt Talbott, left, and LCpl Burns stand in front of a ZU-23 Iranian antiaircraft gun on display at the National Museum of the Marine Corps, Jan. 24. Talbott and Burns were heavily involved in the restoration of the artifact, which was captured by Marines in the Strait of Hormuz during Operation Praying Mantis in 1988.

non-climate controlled, unsuitable environments for what he calls "long-term, good collections care." The bulk of the restoration efforts on "macro artifacts" like the SBD-3 Dauntless previously were conducted in Larson Gymnasium, a crumbling pre-WW II aircraft hangar aboard the base.

In 2015, during the final reassembly of the Dauntless, the hangar-turned-gymnasium was condemned and the restoration team had to relocate the aircraft—and their work on it—to the National Air & Space Museum's Steven F. Udvar Hazy Center in Chantilly, Va., where the Smithsonian Institution provided them with a space to finish the project.

In 2018, Naval Facilities Engineering Command procured a leased commercial space in nearby Dumfries, Va., to serve as a Museum Support Facility and home to the Restoration Branch. It's a brand new building with a warehouse-like interior, featuring a state-of-the-art paint booth, which Kristy says is vital to being able to perform a "national museum-level paint job" on a macro artifact like an aircraft or vehicle, something they previously did not have access to. There's also a full woodworking shop, a machine shop and a welding shop, allowing the team to now perform nearly all of its restoration work in house.

The museum's storage configuration is currently going through a transitional period, said Kristy, with its art collection and a number of other small artifacts in the process of being relocated out of those various buildings on base into a separate, similar space next door to the one occupied by the Restoration Branch.

And while the museum doesn't currently have its own conservation lab for micro artifacts like flags and leather goods—they contract that work out—there's a long-term goal of building their own lab and hiring conservation specialists to perform more of that work in house, said Kristy.

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Various containers of nuts, bolts and other hardware can be found around the Museum Support Facility, where specialists work to restore artifacts with the utmost historical accuracy.

For now, the restoration team, made up of three civilian staff members and two active-duty Marines, sometimes with the help of part-time special assistants or volunteers, are the ones doing the labor-intensive work behind the scenes, and they strive for perfection when it comes to implementing the curator's guidance for a particular artifact. Throughout the entire process, they rely greatly on communication and collaboration with the curators as they work together to produce a finished product that's in line with the story the curator wants to tell.

For example, when the museum acquired the Dauntless, Kristy knew that he wanted it to represent a different airplane than the one that had sat on the bottom of Lake Michigan.

"We had our airplane depict the first Marine airplane from the first Marine squadron to land at Guadalcanal," said Kristy. "I went through, found photographs, wrote a detailed description of how to do the paint, what configuration we needed the airplane, turned that in, and then as they worked on it, we would go back and forth," he added of his collaboration with the restoration team.

Often, restoration requires first taking an object entirely apart and performing a complete inspection before brainstorming ways to fix or recreate the elements that are missing, damaged or deteriorated, said Shaun Pettit, the museum's restoration specialist and a Marine veteran who previously was assigned to the facility from 2008 to 2011 while serving as an active-duty airframe mechanic, in between a tour of duty in Iraq and another in Afghanistan.

In 2013, after leaving active duty, Pettit returned to the restoration facility as a civilian and now serves as the team lead, overseeing a staff that includes two other civilians as well as active-duty Sergeant Megan Talbott, an airframe mechanic, and Lance Corporal Blake Burns, a Motor-T mechanic.

For Talbott and Burns, it's an extremely unique opportunity within their military occupational specialties

to use their Marine Corps training as a foundation for new skills and outside-the-box thinking and problem solving.

"It's a learning experience every single day because no project is the same, no repairs are the same, no techniques are the same and there's no manual," said Pettit, who relishes the opportunity to mentor young Marines in the same billet he once held. "It's just discovery work and learning new techniques and mimicking what they've done in the past."

Typically, the replacement parts they need are for aircraft, weapons or vehicles that are no longer in production, so the staff has to create tooling and make hardware in order to manufacture new parts themselves. Sometimes, they reach out to conservators at other museums, or even private collectors, to see if they have spare parts or can remove a part and send photos of it so the team can attempt to accurately replicate it.

"It's a challenge but that's what drives us. That's how we get through these projects," said Pettit in January, pointing out a 1940s Roebling Alligator III amphibious tractor in the process of restoration. "We could get through this thing and be done in a couple months, but what's taking time is doing everything exactly right, the way they'd done it in the past."

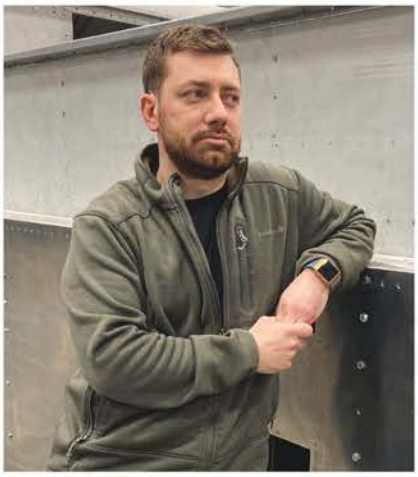
Pettit picks up a part that had been removed from the Alligator.

"You can see something that's been so badly corroded that we can't reuse it," he said. It's the specialist's hope that they have access to the blueprints for the item they're restoring. "For this one, we're not as lucky," added Pettit.

While they try to retain as much of the original material as they can, sometimes a part or component is no longer suitable for use. When that's the case, the restoration team gets to work on problem solving using what Pettit refers to as "reverse engineering."

> **"The key for us is we don't necessarily just do everything right to the naked eye. We replicate the originals even down to the parts that nobody sees."—Shaun Pettit**

"We'll have to fill the gaps," said Pettit. The process involves taking measurements, studying reference photographs and using original materials as templates.



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Shaun Pettit, who previously was assigned to the Restoration Branch while he was an active-duty airframe mechanic, now serves as the museum's restoration specialist who oversees the daily operations at the Museum Support Facility located in Dumfries, Va.

And it's not just about making the exterior of an aircraft, vehicle or other artifact look museum-ready. The team is laser focused on making every single detail perfectly accurate and in line with the curator's notes.

"The key for us is we don't necessarily just do everything right to the naked eye. We replicate the originals even down to the parts that nobody sees," said Pettit, who used the cockpit of the Dauntless as an example. Even though a museum visitor can't see its entire interior, it was immaculately restored down to every last dial and switch.

"At this kind of level the curators aren't involved as much. This is his world—he knows how to put these things together," said Kristy of Pettit. "Once you get to the markings and the final coatings, then we [the curators] kind of come back into play and again we're oftentimes driven by whatever reference images we can find."

When it comes to replicating every precise detail from their guiding reference photos, particularly when it comes to paint and markings on aircraft, the team puts hours upon hours into what Kristy calls "perfecting the imperfections."

Most paint jobs done in the fleet, he said, don't follow the regulations to a "T," so using the manuals for markings wouldn't result in an accurate depiction

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The process for restoring the Roebling Alligator III amphibious tractor pictured in the photo to the left has included using the vehicle's original deteriorated track components, pictured in the above photo on the left, to manufacture replicated replacements, pictured on the right.

Kristy found the two Marine pilots who had primarily flown the helicopter in 2003 and brought them in to be "cast" as figures of themselves that will sit inside the aircraft in the museum.

of what they actually looked like.

"We spend a lot of time trying to figure out how to recreate the mistakes that were made. These things were painted on a moving flight deck or by a lance corporal who was given a roll of tape and said, 'Here, go do this,' " said Kristy.

When working on the Dauntless, he added, they spent dozens of man-hours trying to recreate what was probably "a 30-minute slap-dash job" and sometimes was conducted by multiple people working on different areas of the aircraft at once.

The same thought process goes for something as seemingly negligible as replicating patch repairs on aircraft.

"Patch repair 100 years ago was completely different than it is now, so we replicate patch repairs and other structural repairs the way that they've done it in the past, not how we do it today" said Pettit. "We try to mimic everything to the detail as much as we can possibly mimic."

Across from the Alligator, there's a Bell UH-1N Huey that was part of the March Up in Baghdad in 2003 and saw action at Nasiriyah. The Huey will soon be finished with restoration and moved to the site of the Iraq gallery in the museum's forthcoming final phase, where it will tell the "story" of the role of a forward arming and refueling point (FARP) during the war.

With a little bit of research, Kristy found the two Marine pilots who had primarily flown the helicopter in 2003 and brought them in to be "cast" as figures of themselves that will sit inside the aircraft in the museum and give visitors the opportunity to see what it looked like with a crew inside. It was an experience Kristy won't forget.

"They hadn't seen this helicopter in years, and they climbed back in and went through the preflight checklist like it was yesterday," he said of the pilots. "They told all kinds of amazing stories that we'll reflect. The small little details."

For example, at one point one of the pilots gave his chest armor plate insert to a Marine on the ground that hadn't received his. In its place, he tucked a folded American flag in the pocket where the armor had been and carried it with him as he flew missions over Iraq. Even though no one will ever see it, a folded flag will rest in the cast figure's front pocket, giving the display more accuracy than any visitor could ever imagine.

Another story the Huey pilots told the museum staff was that they typically flew with a box of toilet paper rolls under one of the seats in the back of the helicopter and made a game of throwing them to the Marines on the ground below. When it takes its place in the museum, Kristy will make sure the Huey has a box of toilet paper in the back.

"That's not going to be in any signage in the museum," said Kristy. "It's for the one-tenth of one percent of people who will know." This particular Huey was retired in 2013, so the restoration team had to figure out how to make it look like it would have in 2003. They were able to find the antenna housings for part of the aircraft's antiaircraft missile warning system, which had been taken off later in the aircraft's life, and changed the squadron name on the aircraft. They also crafted a fake infrared countermeasure that was originally part of the aircraft's defensive system but was removed due to the highly classified technology it contains, using tinted orange plexiglass. That level of attention to detail requires a great deal of time and effort, but the Restoration Branch team won't have it

Ben Kristy, the collections chief for the National Museum of the Marine Corps, (below) points out intentional imperfections in the paint job on a Bell UH-1N Huey that will be installed in the museum's Iraq gallery. The helicopter (right) flew in the March Up in Baghdad, Iraq in 2003.

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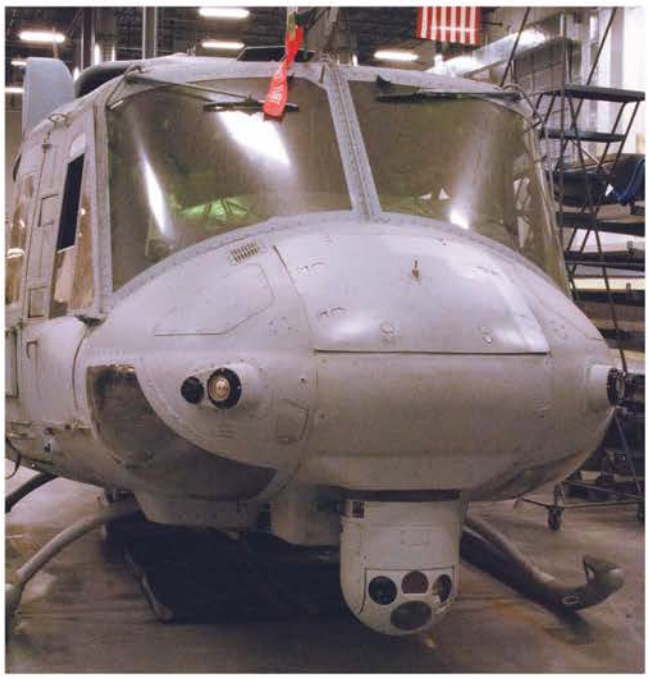

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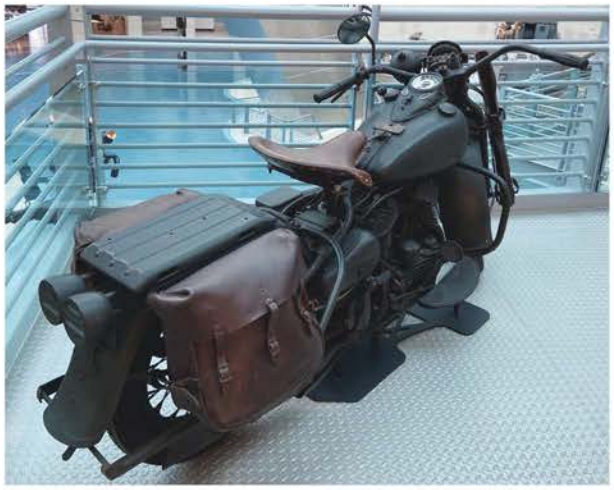

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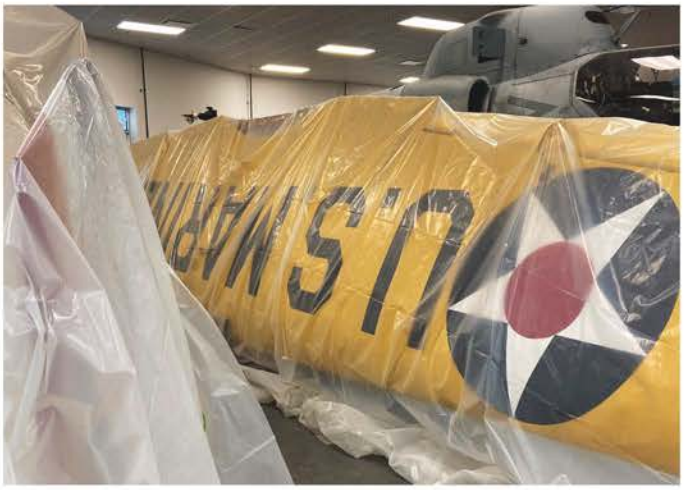
A Marine-issue Harley-Davidson motorcycle from WW II is on display at the National Museum of the Marine Corps and was a personal favorite restoration project for Sgt Talbott, a Marine airframe mechanic assigned to the Restoration Branch.



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The upper wing of a Boeing FB-5 biplane is currently being stored in the Museum Support Facility as the restored aircraft awaits installation in the forthcoming Inter-War Years gallery.

any other way. For them, it's all about telling the Marine Corps story and preserving its history for posterity.

Most of the items in the restoration facility are slated to go into the museum at some point in the future, said Kristy.

A Boeing FB-5 flown by the Marine Corps in the late 1920s and early 1930s sits in one corner, awaiting placement in the final phase's Inter-War Years Gallery. The museum hired a contractor in Wenatchee, Wash., to take on the restoration process during the time of transition from Larson Gymnasium, and the Restoration Branch will complete some minor work on it prior to its installation.

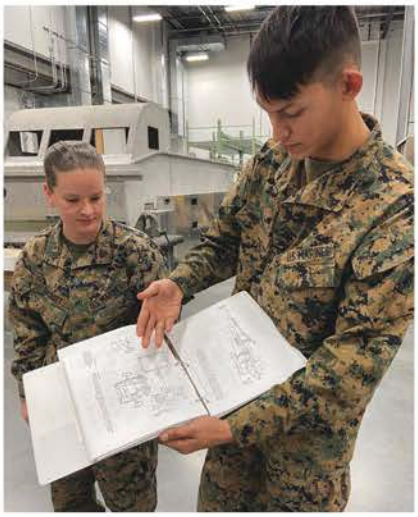
There's also a Bell AH-1W Super Cobra with the famed "Never Forget" 9/11 paint scheme, which was added to the helicopter by Marines in Afghanistan in 2011.

"From a restoration standpoint, it's more preservation," said Kristy of the Cobra, adding that the team cleans the aircraft to prevent corrosion, preserves the engines, and checks for any corrosion issues that might have been created by previous fuel leaks.

By 2025, museum visitors will be able to see it up close as part of a stand-alone 9/11 exhibit.

"We're actually kind of coming to the end of a chapter so to speak," Kristy said of the planned completion of the museum's phased galleries in 2025. "For the last 15 years we have been restoring things that were programmed to go into the museum. As we are finishing off the galleries, now we're getting to a point where we're either transitioning to restoring things that aren't necessarily slated for immediate display but need to be restored because of their condition, or potentially to support as a loan program elsewhere."

Recently, the team worked to restore a wheel from a WW II-era Japanese infantry gun that is part of the museum's collection, but is on loan to the Command Museum at Marine Corps Recruit Depot Parris Island, S.C. The wheel's wooden spokes had rotted and deteriorated, and at first Pettit assumed they'd just make new ones out of wood. However, they decided to experiment with casting, making a mold using one of the spokes that was in better condition and casting new spokes using urethane casting resin that will far outlast the wood.



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Sgt Talbott, left, looks on as LCpl Burns, right, explains the challenges involved in restoring the ZU-23 Iranian anti-aircraft gun using a manual written entirely in Russian, Jan. 10. Burns, who was since promoted to corporal, is a Motor-T mechanic who says he'll take back to the fleet many valuable lessons from his work with the Restoration Branch.

"This was a skillset that we previously didn't have, so this was a way for the crew to expand what they're learning how to do," said Kristy.

For Sgt Talbott, it was a new and exciting opportunity.

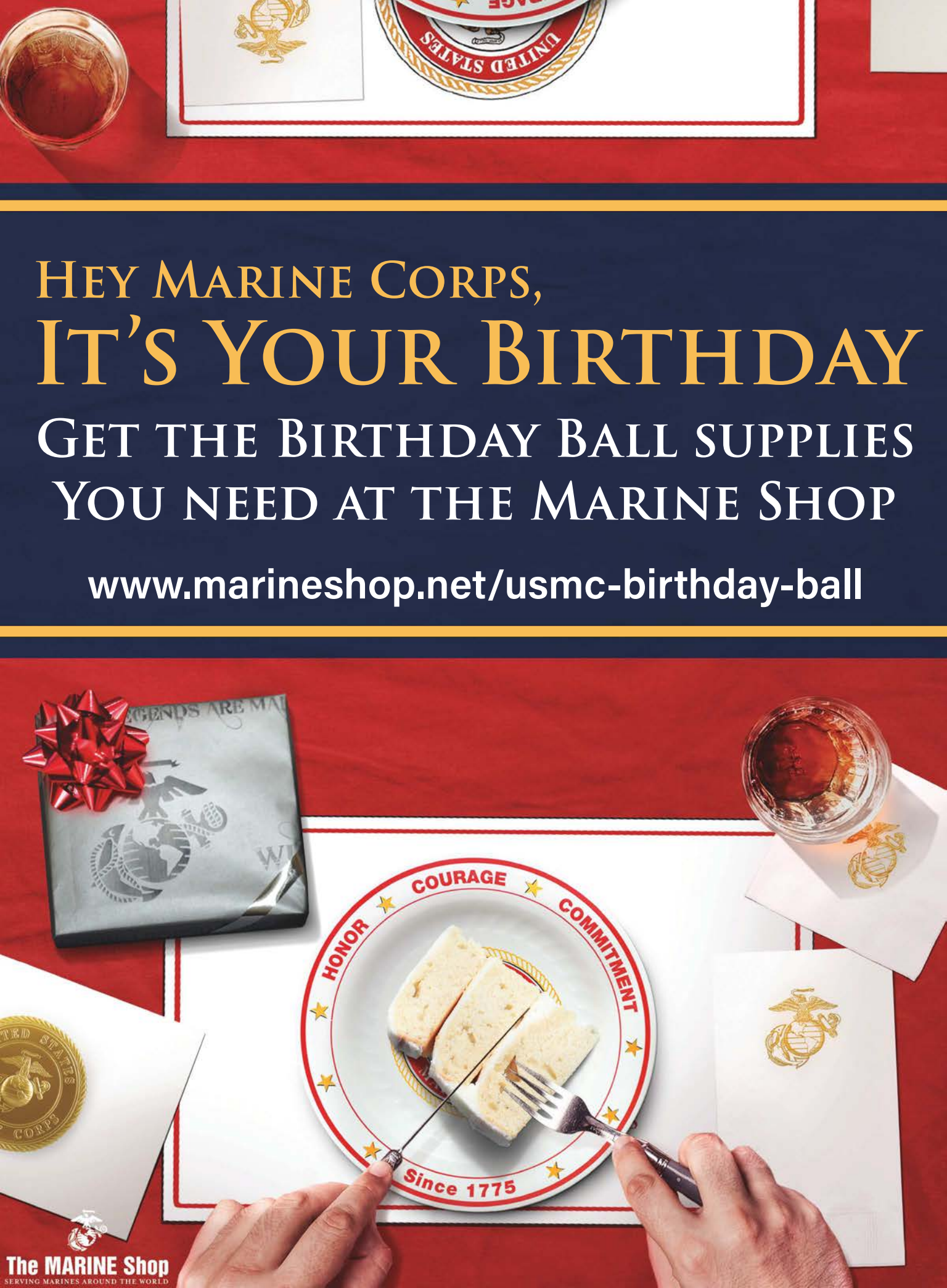
"That's something as an airframer I would never get to do. I really enjoy it," she said.

LCpl Burns particularly enjoyed working on the restoration of a ZU-23 Iranian anti-aircraft gun that was captured by Marines in 1988 in the Strait of Hormuz during Operation Praying Mantis. For disassembly and reassembly, the team had to rely on an old manual for the weapon written entirely in Russian. For Talbott, there's no better feeling than walking into the museum and seeing a WW II-era Marine-issue Harley-Davidson motorcycle that she spent hours working on.

"To actually see it in the museum, that's the best part," Talbott said.

When their time at the Restoration Branch is over, the Marines will return to the fleet where they'll bring with them a greater aptitude for creative problem solving and an increased attention to detail. And they'll never forget the once-in-a-lifetime opportunity to work for the museum while serving on active duty.

"We get to bring back history," said Burns.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