



SOLUTIONS IN HIS POCKETS

How Andrew Mourad's 3D Printing Innovations Are Accelerating GPO Production



Andrew Mourad, who joined the GPO Recent Grad Program in August 2024, has a habit of carrying solutions in his pockets. Quite literally.

“Half the time my pockets are filled with pieces of plastic that I’m testing,” he says with a laugh—a reputation he’s earned at GPO’s Stennis facility, where his 3D-printed parts have quietly transformed how machines are repaired, maintained, and improved.

A General Engineer in the Government Secure & Intelligent Documents (GSID) department, Mourad is helping reshape GPO’s production process by using 3D printing to reduce downtime, cut costs, and empower teams to fix problems faster than ever before.

At its core, Mourad’s work addresses a simple but critical problem: waiting for parts slows everything down.

“3D printing helps GPO because it’s cheaper than shipping a new part, and we don’t have to wait for it to arrive,” Mourad says. “Sometimes we need a part just a little shorter or a little wider. It lets us fix problems much faster than ordering replacement parts.”

Using 3D software, Mourad models custom components and moves them through a rapid prototyping process—often producing usable parts in just a few hours.

Today, nearly every major piece of equipment involved in producing passports and smart cards—from Die Perf (DP) machines that cut passport books to A-lines that sew passport pages together and attach the covers to Kluges used for foil stamping and embossing to Melzers used to make smart cards.

“There are only three machines here in Stennis that don’t have a part I’ve made with 3D printing,” Mourad says.



One of his favorite examples involves the DP machines. Previously, technicians had to remove and reapply heat-shrink metal, a time-consuming process that risked damaging passports. As a solution, Mourad designed a flexible plastic “boot” that simply slips on.

“The boot works better than what was on the machine and improved its function,” he says. “It takes about 20 seconds to put that boot on versus two minutes before. I like being able to cut out that downtime for technicians. That time saved really adds up.”

The durability of Mourad’s designs has surprised even him. A metal part on a smart card machine typically lasts three to four months. A plastic version he designed has now been in use for four months with no visible wear.

“The issue was metal grinding on metal,” Mourad explains. “Now it’s soft plastic grinding on soft plastic, so it can last just as long, if not longer.”

According to Jordan Gunther, a General Engineer and Mourad’s supervisor, the speed of these solutions has made a measurable difference.

“If something breaks, realistically, we can be back up and running with a new part in half a shift,” Gunther says. “My stance has always been: if a 3D-printed solution makes our teammates’ lives easier and production better, let’s go for it.”

That support has shaped the culture around innovation at Stennis.

“Jordan’s stance has had a big impact,” Mourad says. “People feel comfortable walking up to me, asking for help, and talking through ideas for improving the production process. People will walk up to me and say, ‘I think we can change this up a little bit.’ And I want to find a way to make it happen.”

He’s also benefited from collaboration across GPO office locations, working closely with Management and Program Analysts, GSID Daniel Ashby and Julian Aviles-Pagan in Washington, D.C.

“They had more 3D printing experience than me,” Mourad says of his DC teammates. “It was great to be able to talk with people who do this kind of work every day.”

Mourad partnered with Aviles-Pagan on a project for the Melzers, designing a threaded sucker head to support smart card production. Mourad modeled the part in Stennis, Aviles-Pagan printed it in D.C., and the team iterated together based on production needs. The parts improved production, helping ink stick much less than it did to the brass part they had been using.

“I’ve got some in my pocket right now,” Mourad says of the part. “Now we’re testing different plastics to see if they would work even better.”

At GPO, those pocket-sized pieces represent something bigger: faster production, smarter processes, and a future built—layer by layer—through innovation.

