Friends, Donors, and Fellow Lovers of Liberty,
I had intended to write this update after jacket design had been nailed-down. But some have asked for another update, and it has been some time since the last. The wait won't be much longer though, and I'll explain to you all some of the issues we face and have faced on the way to open-source and commercial release. This will be more technical than other updates.

Adhesive species has been selected.

The mechanics and dynamics of the core/jacket bond are a critical aspect of the Dagger's design. The bond must be strong enough to survive firing and yet weak enough such that the core and jacket separate in an optimal fashion upon terminal impact so as not to impede core penetration or jacket expansion, depending on the presence or absence of armor on the target. Additionally, the adhesive must behave properly during bullet assembly and curing. Finding an adhesive which optimally satisfies all these design criteria has been difficult. The adhesives industry is tailored to specific common applications and maximizing bond strength on a given substrate in adhesive selection and salesmen have been bewildered by our requests for a lower-strength solution between dissimilar materials. And of course no one in the world has ever used adhesive in such an application. So I'm pleased to announce that **several months of testing adhesives ourselves has led us to a superior adhesive formulation**, a cyanoacrylate produced by Loctite.

Jacket development continues.

Though we were closing in on a final jacket design last update, design feature dependency demanded we reprioritize adhesive selection before finishing the jacket. **Adhesive selected, we've returned to focus on jacket design.** Jacket design indeed comprises most of the optimization work since we unveiled the first crude embodiment of the Dagger nearly a year ago. Since then we've taken pains to tailor and test jacket geometry to optimize:

- Internal ballistics, ensuring that the bullet exits the barrel at the highest possible velocity and energy, and with as little variation as possible (to maximize accuracy) at the specified pressure.
- External ballistics, ensuring lower air drag and thus also maintenance of velocity and energy at range as well as flattened trajectory.
- Terminal ballistics, ensuring clean jacket shearing on impact with armor (so that the bullet's energy isn't wasted trying to pull the jacket into armor) and favorable jacket expansion in ballistics gel/flesh (for greater lethality).

As a result, **the current embodiment is decidedly superior to the first workable prototypes**, but it has and does cost significant time and effort, especially for external ballistics testing. We've also found some of these jacket-design properties to be performance trade-offs such that different versions of this technology (Piggy Popper vs. Dagny Dagger) will have to emphasize one performance domain over another. We are in the middle of a multi-faceted investigation of the effect of ogive shape on external and terminal performance, after which we only have left a simple test of differing bearing diameters to be finished with jacket (and whole bullet) design.

Piggy Popper manufacturing is planned to commence in March 2022!

As you may remember from last update, the Popper is the hunting (and for now general-purpose defense) variant of the Dagger technology, which will cost MUCH less than the premium Dagny Dagger while offering the same superior performance against unarmored targets at the cost of slightly decreased penetrative performance. **We have begun to ramp-up preparation for commercial production**, and Michael in particular has been busy ensuring we meet our intended ETA to market. We have been speaking to our friends at Fenix Ammunition about loading the projectiles we produce and are happy to have them tentatively on-board. Most of this effort is in the development of a machine and process to automate mass-manufacture this unique projectile.

Premium Dagger production will follow as close-behind as possible, however there is much greater logistical difficulty with Dagger production because of the cost and availability of the special alloy in commercial quantities. We will need much more capital than we can wisely manage right now to purchase the raw alloy. We will easily afford this cost after a short while of Popper sales, or more likely on-board sufficient investment shortly after Popper production begins, but the real issue is the standard 4-month lead time for the alloy has become ~9 in the communist covid/Biden economy of inflation and rampant material shortages.

We feel great pressure and responsibility to fulfil the donation favors promised to you, our gracious donors, and all along the way have searched for avenues to fulfil that responsibility ASAP. **We will certainly be able to make good on the keychains as development ramps into scaled production**. In addition, to those of you who donated ≥$100 before the crowdfunding goal was reached we promised a box of first-batch Daggers, and priority access to those who donated ≥$100 after the goal was reached. We certainly stand by that commitment, but we regret that due to said logistical factors simply outside of our control that it may still be some time before any premium Daggers may be produced beyond developmental prototypes. So when the time comes in the Spring, **we may offer you the option to claim a few boxes of the Popper** instead of one box of the premium Dagger **if you choose.** This is probably a good option for such donors in prohibiting states like CA and TX where we can't ship premium Daggers anyway.

Ghost gunner lathe work is stalled.

We've intended to add lathe capability to the Ghost Gunner open source mill in order to facilitate Dagger core production as our turn-key DIY solution. Unfortunately, the Ghost Gunner **spindle speeds (5-8kRPM) are simply too fast** for reasonable lathe work. We strongly believe that GG machines may be used to turn cores and even jackets, but we may have to wait to realize this potential until the release of a software update which will allow the machine to run at sane speeds, which I am told and believe is in development at Def. Dist. In the meantime, **we will try to find mechanical work-arounds** with what time we can spare, and **the core may still be DIY'd by other methods**, but we would certainly prefer CNC turning on the GG.

Printed jacket investigation continues.

SLA 3D printing remains our intended turn-key for DIY jacket production, and **still looks promising** after much investigation. Dimensional tolerances for bullets must be kept fairly tight, and controlling dimensional distortions endemic to 3D printing has been the focus of this investigation so far. Michael is the principal investigator on this matter, but must balance his time

between this aspect of DIY support and preparation for commercial manufacture. In fact this **fork between the open-source/DIY aspect of the project and commercial availability has been a decision point** for us for some time. The responsibility on us to deliver falls first to you donors whose support has taken us this far, but many of you are among the traditional gun crowd who simply want to see the product on store shelves and in your hand ASAP while many others are more interested in DIY/3D printed weapons and decentralized manufacturing. It is difficult to know which to prioritize. We will certainly be able to open-source all manufacturing specs upon commercial release to make good on our promise of non-monopolistic open-access, but we were hoping to also fully support DIY production upon commercial release, a goal which is still possible, but looks less likely in light of trouble with the ghost gunner.

Excitement mounts over here as we inch closer to production in the Spring. Some days it seems so close it's difficult for me to keep trucking on the development because I can already taste the finish, but I force my way through as always. I'm proud to say, performance-wise, the Dagny Dagger will be the best 9mm ammunition ever mass-produced. It's a tall claim, and a little over a year ago I wouldn't've believed it possible, but the testing results we're privileged to witness here convince me as they will any knowledgeable, discerning consumer. I can't wait to move back to Oklahoma for production, where we will finally have proper facility, equipment, and budget to ease and hasten development of the other calibers of Dagger tech. We'll move at light speed compared to the rag-tag, clandestine outfit we've had for 9mm Dagger dev. Not only that but we all look forward to moving on from the Dagger to even more interesting projects such as arc ignition and the Halley Hose. The future looks bright, for me personally, Atlas Arms as an organization, and the home-built and individually-purposed weapons space as a movement.

As always, we greatly appreciate your financial and social support which has made all this possible. Reach out any time by email or through Twitter.

--Austin Thomas Jones
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