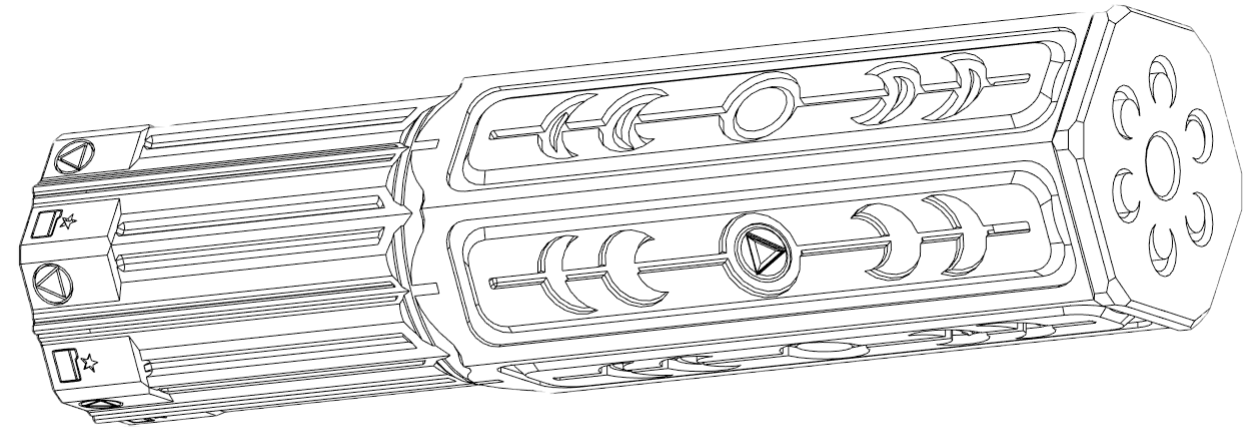
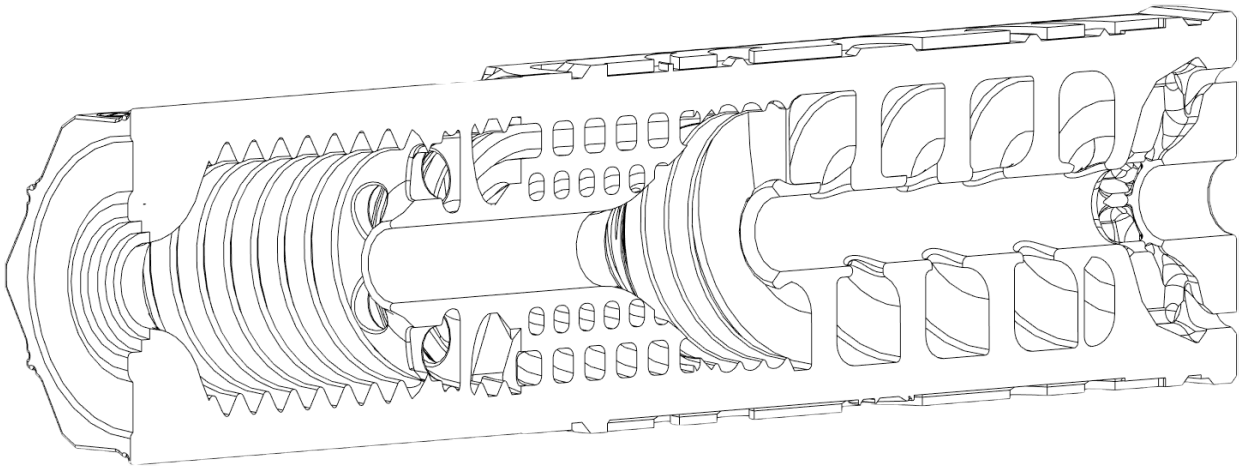
THE GATALOG PRESENTS





THE RGB CRESCENT

BY RUBYGB

Published by The Gatalog
June 7h, 2023
https://thegatalog.com/

Document Version 1.0

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"And since you know, I come from a place that restricts firearms ownership, the only way that I am able to safely test the firearm, to shoot it, is to try and be as quiet as possible. **That's why I need a suppressor.**"

-JStark1809

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FOREWORD

In America, the silencer market is cost and/or legally prohibitive for many, including myself. However, in many other parts of the world, acquiring a silencer is less difficult than acquiring a firearm. When jstark1809 published the FGC-9 MKI, a major barrier fell, and he sealed gun control's fate. However, many barriers remain in place, and there is much more innovation left for us to do before we undermine every gun control measure, around the world, once and for all.

My beta team and I learned much during the course of the development of The Crescent, and a number of techniques, ideas, and design elements emerged that enable everyone to have access to a quality, flow through, solid body, 9mm, pistol-caliber-carbine silencer. In addition, we proved that it is effective and durable with Subsonic 300BLK, which, for many Americans, is a boon. The theoretical upper limit to the cost for an American to make and use The Crescent is around $450, including the cost of a 3D-printer. The cost also includes a tax stamp, serial number plate, filament, a muzzle device for mounting purposes, and a wrench. For those who already own a 3D-printer, the total cost is around $250 or less.

I imagine the use cases for The Crescent are countless. After all, it is a safety device. Whether it is for home defense, competition shooting, range days with friends, defending your life and liberty against tyranny, defeating a military dictatorship in Myanmar, surviving as transgender person in America, or enjoying yourself as a simple firearm enthusiast, **this silencer is for everyone**.

Even if you are the kind of person who holds an irrational hatred of transgender people, like myself, I hope you find The Crescent useful. Remember though, a transgender woman who with no engineering degree, prior silencer use, or CAD experience designed it. What have *you* done to perpetuate freedom?

The Crescent is just the beginning of my work: Freedom from tyranny for all.

—Ruby Grace

ACKNOWLEDGMENTS

First and foremost, I would like to thank **jstark1809** for inspiring me in the first place. Though he may be gone, his spirit still lives and fights on.

I began this project alone, and as I worked, it grew in scale and scope beyond my wildest imagination. While I designed The Crescent myself, countless individuals' time, help, and support made the final release possible. There are too many volunteers to name, and some prefer to remain anonymous, so I will thank those I can.

- A big thanks to @**Dr.Death**, @**Freeman1337**, @**Gerald.Katz**, for their encouragement, guidance, and, at times, sharing their design expertise. Extra thanks to Katz for letting me use his custom threading profile.
- Thank you @**Ethan.Hall** who gave me all the resources and information I needed to begin work on The Crescent. Your guidance was integral in forming my obsession with its design. Seriously, thank you.
- Shoutout to @**PLA.Boi,** the maker of the FTN Silencers, for being such a chill dude, and for his input and insight with the project.
- Thank you too to all the other developers and interested parties that I conversed with during the course of development and beta testing, y'all have some amazing ideas and some major talent. A special note of thanks to @**LyaSBR** for our chats: I'm glad I was able to help you see the world in a new light.
- Thank you to @**Kukitan** and @**RSmith28** for their help and work on the documentation.
- Thank you @**IAmArizona** for your encouragement, support, and for introducing me to the community in the first place. You made me feel at home. You're a real one.
- Thank you to my friends @**Vega_Holdings, @Sparquah, and** @**Halspai** for helping test the display, charm, and flash hider variants. Y'all are the best and I couldn't have done it without your care and support.
- A special thank you to **T** and to **Karkat**. I love you both so much.
- Last, but certainly not least, an incredibly special thank you to all the unnamed beta testers who made this project a reality. I literally couldn't have done it without y'all. Thank you from the bottom of my heart.

AMERICAN LEGAL WARNING

NOTE: We are not lawyers, and no part of this document is to be construed as legal advice.

SILENCER DEFINITION

The Crescent is a firearm silencer, as it is federally defined. A firearm silencer is "any device for silencing, muffling, or diminishing the report of a portable firearm, including any combination of parts, designed or redesigned, and intended for use in assembling or fabricating a firearm silencer or firearm muffler, and any part intended only for use in such assembly or fabrication." (18 U.S.C. § 921(a)(25))

PENALTY FOR ILLEGAL POSSESSION

The federal penalties for manufacturing a silencer outside of federal compliance prescribe that "upon conviction, [one shall] be fined not more than $10,000, or be imprisoned not more than ten years, or both." (18 U.S.C. § 5871)

LEGAL COMPLIANCE – FORM 1

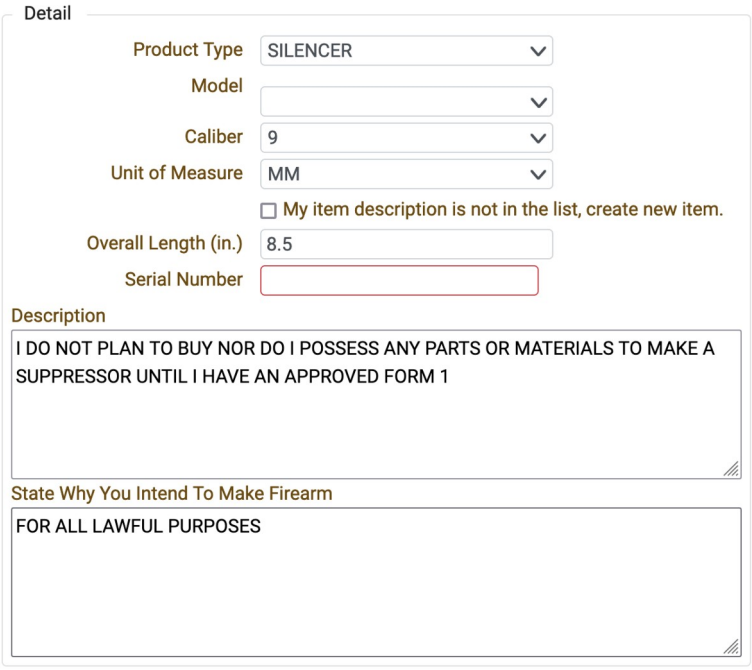
To avoid the aforementioned criminal penalties and legally manufacture a silencer (under federal law), you are required to file ATF Form 5320.1 (Form 1) and pay the applicable $200 registration tax. The easiest method of completing these required steps is to file using the ATF's eForm system at https://eforms.atf.gov.

FORM 1 INFORMATION

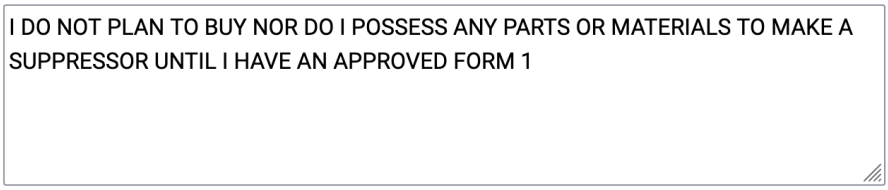
NOTE: This document does not automatically update. Requirements and best practices are subject to change. Please conduct your own research before filing ATF Form 1.

There are various guides available online for navigating the eForm website, such as this video. While the United States government legally obligates you to register your silencers, it is your protected constitutional right to omit any more than they legally require. The pertinent information for The Crescent is as follows:

- ▲ The "manufacturer" will be *'FORM 1 REGISTRATION'*
- ▲ The Caliber will be the largest diameter caliber it is rated for, which is *'9MM'*
- ▲ The overall length comes in at about *'8.5in'*
- ▲ The description should say variation of *'I DO NOT POSSESS, NOR DO I INTEND TO BUY ANY PARTS OR MATERIALS UNTIL I HAVE AN APPROVED FORM 1'*
- ▲ The intention should state *'FOR ALL LAWFUL PURPOSES'*



The final section will ask you for a photograph of what you intend to make. It is recommended that you upload a screenshot of your description, such as the picture below.



STATE AND LOCAL LAWS

Various state and local jurisdictions may require compliance with federal law, apply additional restrictions on silencer manufacture and/or possession, or prohibit silencers outright. Please research how your state and locality regulates silencers, and all other firearms, optimally. Consult an attorney if you have questions.

WHAT IF MY CRESCENT WEARS OUT OR BREAKS?

You are required to completely destroy your Crescent send a notice to the ATF that it is completely destroyed. To make a new one, you are required to file a new Form 1. These requirements, are, or course, something you never need to worry about if your Crescent never wears out or breaks. If a tree falls in the woods and nobody heard it, did it actually make a sound?

WHAT IF I DON'T CARE?

Please reconsider. Do not underestimate what a felony on your record will do to you. A felony conviction will keep you from voting, keep you from serving in the military, keep you from attaining or force you to forfeit professional licenses, complicate finding a job, cost you in fines and legal fees, send you to prison, and worst of all, keep you from legally owning a firearm ever again.

WHAT IF I *STILL* DON'T CARE?

Well, shoot. I guess you don't. In that case, please avoid getting caught.

At the very least, watch this and this.

ABOUT THE CRESCENT

The Crescent is a solid-body, hybrid silencer rated for all 9mm, and 300 AAC Blackout subsonic ammunition. The Crescent's unique design grants it a number of advantages over previous 3D-printed silencer designs. It combines elements of baffled and flow-through elements, specifically designed for at-home, FDM 3D-printing as an alternative for gun owners who want practical hearing protection without shelling out a pretty penny. The Crescent is intended for use with fixed barrels. Without some some kind of piston, firearms with tilted barrel designs will not cycle.

I designed The Crescent with various utilitarian uses in mind, ranging from home defense, hunting, and competitive shooting. It is useful for recreational shooting purposes as well. I did not design it for use in any harmful or illegal activities, so please avoid engaging in them.

KEY FEATURES

- ▲ **Sound Suppression and Forwarding**
- ▲ **Full Flash Suppression (After the First Shot)**
- ▲ **Full Auto Rated**

I developed The Crescent with ease and accessibility at the forefront, and we tested it exclusively in eSun PLA+ with fantastic results. All are welcome to print it in other, stronger materials, but we established the baseline.

While The Crescent is useful right off the print bed, after it is complete, that does not necessarily make it best version of itself that it can be. There are three post-processing options, with each one having their own strengths and weaknesses. In order of increasing effectiveness:

Option 1: No Post Processing

The simplest option. One simply prints a threaded model, and then they mount it directly to the barrel. This option has the advantage of simplicity and ease, however it is the weakest overall, and it will likely suffer from earlier concentric drift as a result. If one does not have access to either of the other two methods, this method will suffice.

Option 2: Heat Reinforcement Threading (HRT)

Heat reinforcement threading is the process of using a heated, externally threaded muzzle break as a die to thread The Crescent. This allows one to screw The Crescent onto the muzzle break, which is quicker and easier than directly mounting it to the barrel. It also allows the muzzle break to act as a sacrificial baffle, helping to lessen wear on the inside of The Crescent during its course of use.

Option 3: PLA.Boi's Epoxy Reinforcement (PBER)

Developed by the brainchild of FTN developer PLA.Boi, this method uses epoxy resin to set a metal thread-changer. The epoxy provides some level of heat resistance for the area around it while also holding The Crescent firmly in place. This is the best option for reducing concentric drift and the risk of baffle strikes.

OPERATION & SAFETY

No silencer lasts forever, and The Crescent is no exception. If you ever played Metal Gear Solid V, You can expect The Crescent to outperform the Tier-3 silencers in the game, which break after 60 shots fired. One may also complete certain operational procedures in order to maximize the lifespan of their Crescent.

USE

Testing demonstrated that around ninety continuous shots or three (3) extended magazines of continuous fire is the limit of The Crescent before operational damage begins. Unless there was an error while printing, this is what you can expect.

The Crescent is operable wet or dry, as long as the liquid does not corrode or damage the material itself. This may help minimize the flash on the first shot.

OPERATIONAL DAMAGE

Operational damage generally consists of baffle strikes, wherein the threads warm, and the firearm's recoil cause The Crescent to wobble and drift off the center of the bore. This is why the epoxy reinforcement method is the strongest of all the post processing techniques, as it physically secures the threads in place and keeps the silencer concentric.

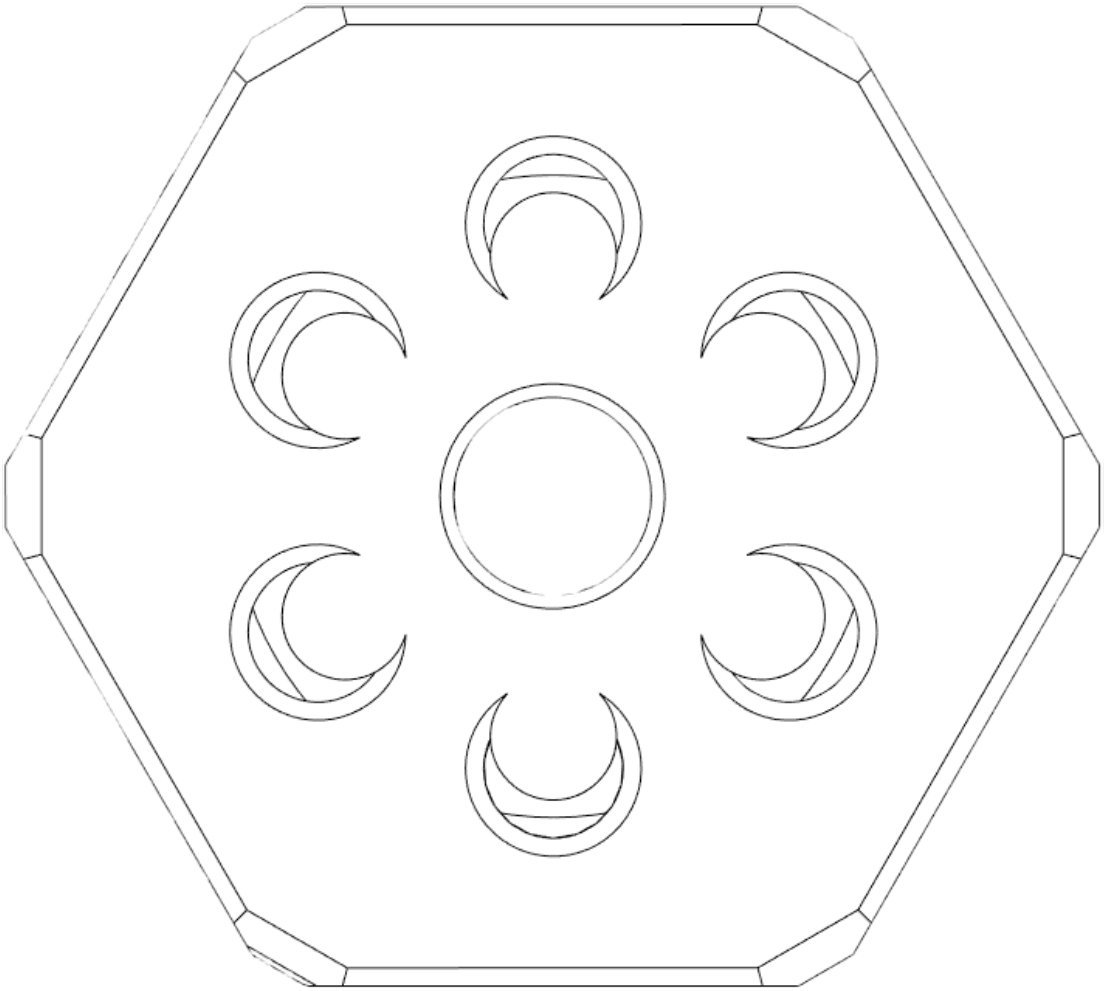
Another considerable source of operational damage is caused by warping. Warping occurs when the plastic is cooled too quickly after heating up. Removal of The Crescent from a firearm immediately after its continued use may cause more warping, as the hot gasses and air exit the blast chamber.

CATASTROPHIC FAILURE

While The Crescent is designed for durability, there is always a possibility of catastrophic failure, especially if you are using it outside the range of rated calibers.

However, I have some good news. FDM 3D-printed objects are weakest along their Z axis. In the event of a catastrophic failure, The Crescent will separate along the Z axis, and the front end of The Crescent will project forward a number of feet. A catastrophic failure will leave the shooter, as well as anything adjacent to them, unscathed.

A slightly less catastrophic ‘catastrophic failure’ is caused by thread stripping. Throughout the course your Crescent’s use, the heat of the barrel, in combination with the force and recoil of the shots, will strip the threading and launch the silencer forward. This is especially likely if you utilize the pre-threaded option. If this happens to you, you can repair your Crescent by reprocessing it with epoxy and a thread changer or applying more material to the formerly threaded area with a 3D pen.



MATERIALS, TOOLS, & MACHINERY

To construct The Crescent, you will require the following:

A 3D-Printer & A Developed Understanding of How to Use It

Note: The length of The Crescent is 218.5mm. Please ensure the Z-Axis of your printer's build volume is at least this tall. Sorry, Prusa MK3(S) owners.

A Stovetop

You will use this item in the HRT option for post-processing. It does not matter your stove a gas or electric one. All that matters is that you can use it to heat a piece of metal to around 160-180°C.

eSun PLA+

Use of other filaments is experimental. Please exercise caution if you choose to do so.

12in/300mm Long ¾”/10mm Wooden Dowel

This object is a tool to ensure your Crescent is aligned properly with a barrel. You will also use this item in the PBER method for post-processing.

1/2”-28 to 5/8”-24 Thread Changer

You will use this item in the PBER option for post-processing. These are available through various online retailers.

Epoxy Resin

You will use this item in the PBER option for post-processing. It is available through various online retailers as well as your local craft and hardware store.

Externally Threaded Muzzle Break

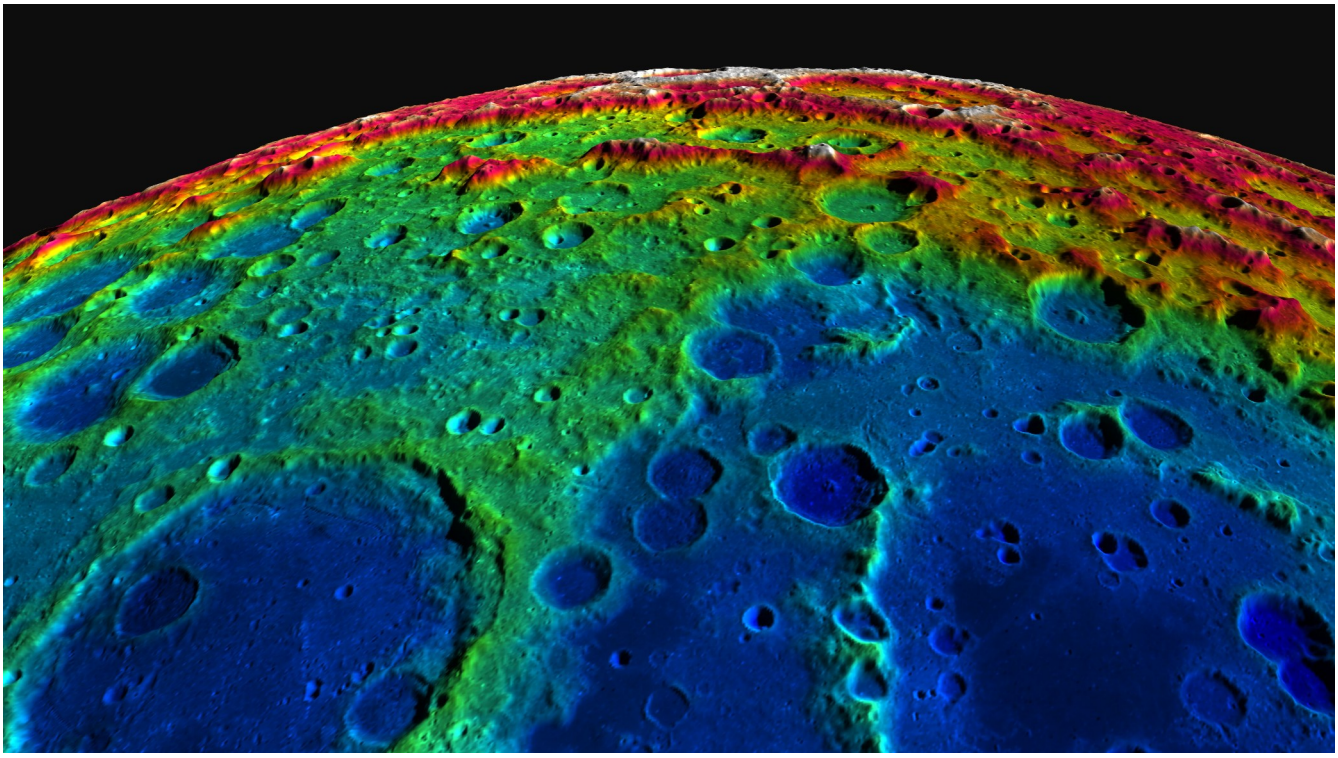
You will use this item in the HRT option for post-processing. They are available through various online retailers in conjunction with a mounted blast can.

MAF Serial Plate

These are available for purchase from MAF for $15 each, and they will engrave the plate for you.

Soldering Iron

You will use this tool for the installation of the MAF Serial Plate. They are available online and at your local hardware store.



PRINTER SETTINGS

Note: The following are merely recommendations based on the experiences of the beta testers. All beta testing was in eSun PLA+. You know your 3D-printer better than we do, but please understand that any deviation is experimental.

Orientation: As Depicted

Nozzle Temperature: 215-220°C

Bed Temperature: 60°C

Layer Height: 0.16mm

Wall Thickness: 3.0mm

Top/Bottom Thickness: 2.0mm

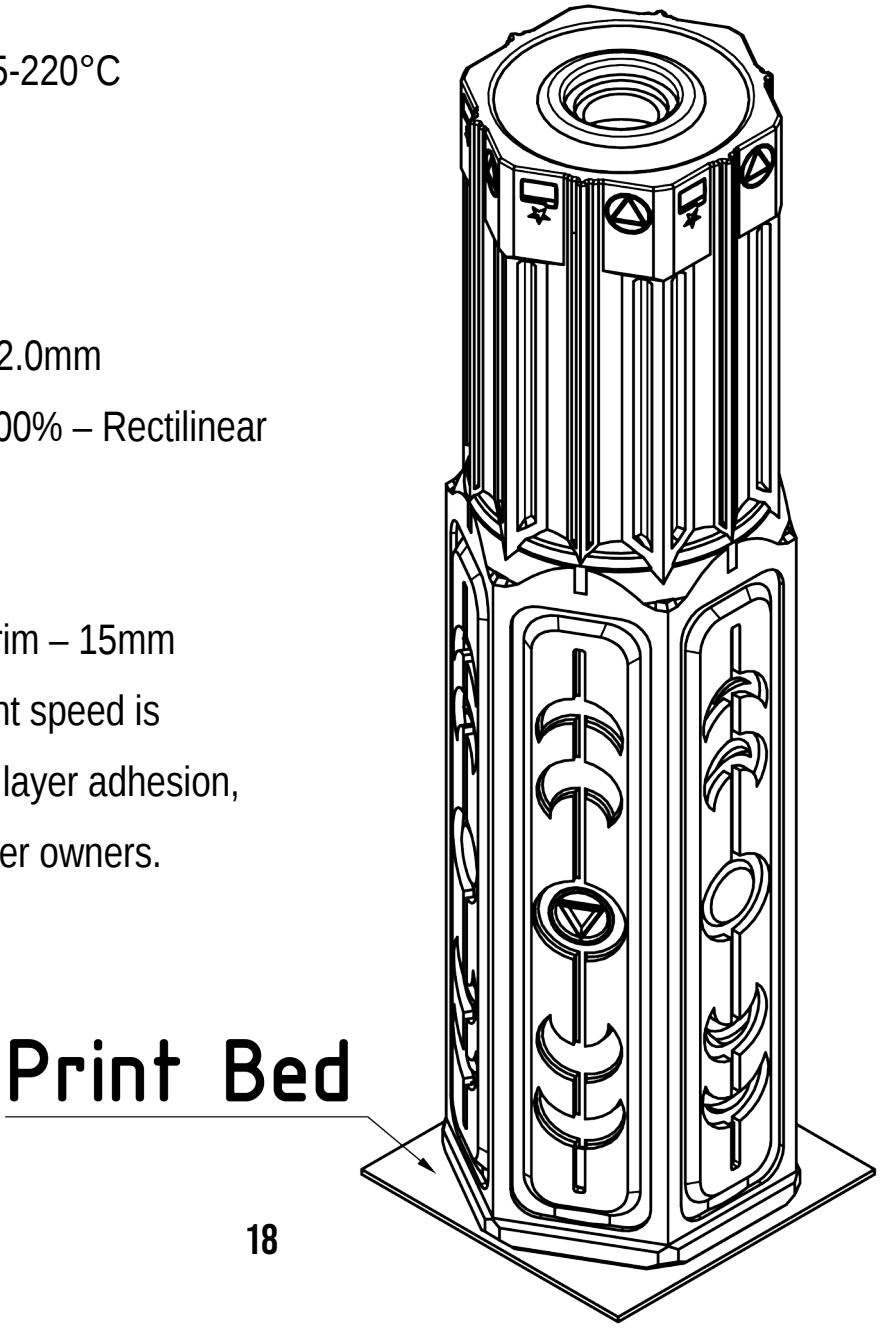
Infill: 99% – Gyroid OR 100% – Rectilinear

Print Cooling: 30%

Supports: None

Build Plate Adhesion: Brim – 15mm

Print speed: A slower print speed is recommended to improve layer adhesion, especially for Bambu printer owners.



POST-PROCESSING

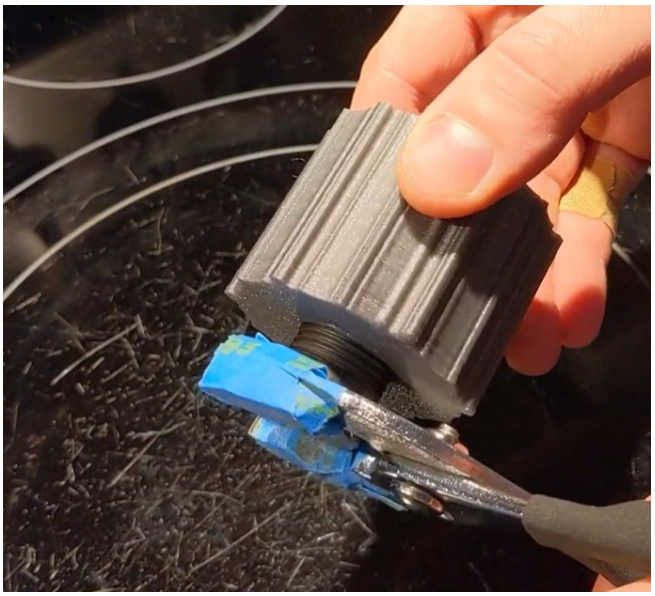
HEAT REINFORCEMENT THREADING (HRT)

1. Heat the muzzle break on your heating element of choice.

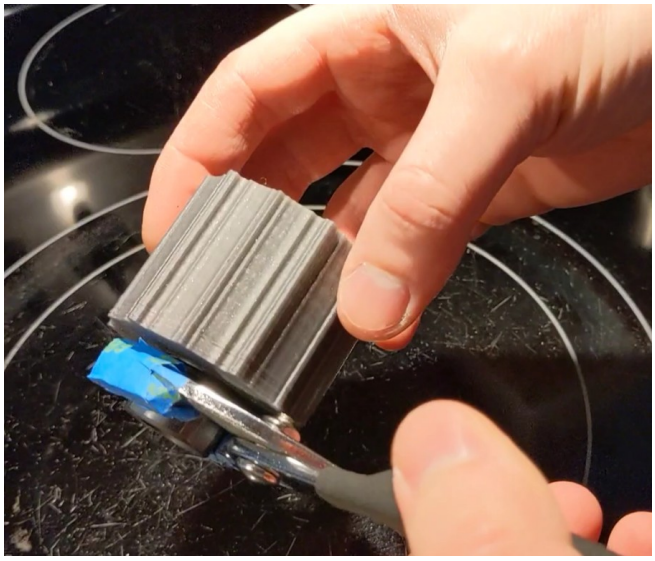
2. Use pliers to place the front of the muzzle break onto The Crescent once it is at an appropriate temperature (160-180°C).

3. Gently apply force until the muzzle break is inserted up to the external threading.

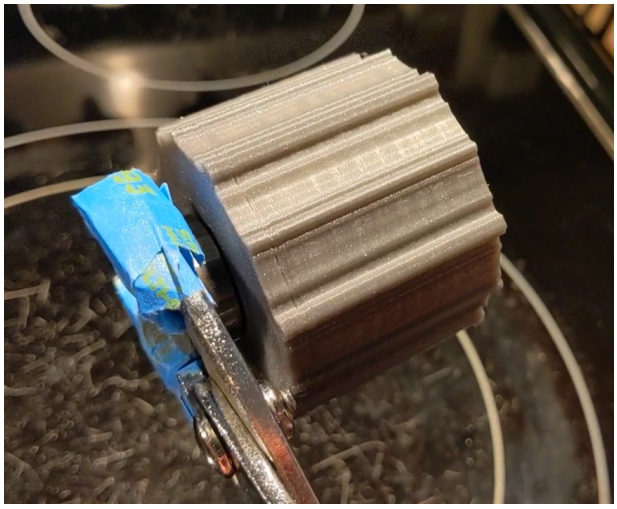
Note: *Despite what the images depict, this process is optimally performed with the front face of The Crescent resting on a flat surface.*



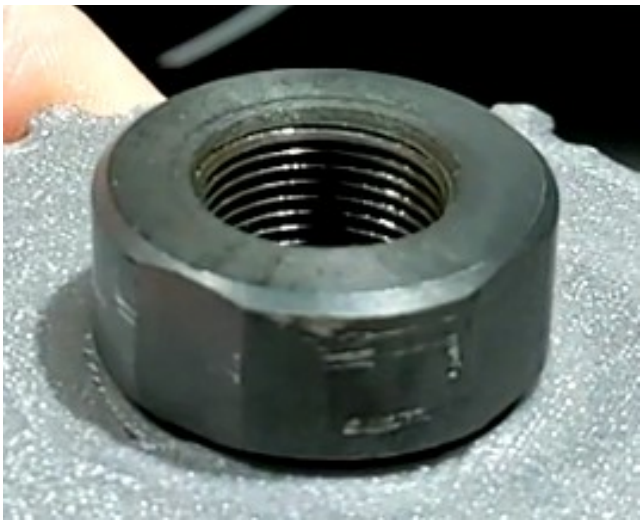
4. Gently apply pressure to the top of the muzzle break while twisting in the direction of the threads. If the muzzle break cools too much, unscrew it to remove it, and return it to the heating element.



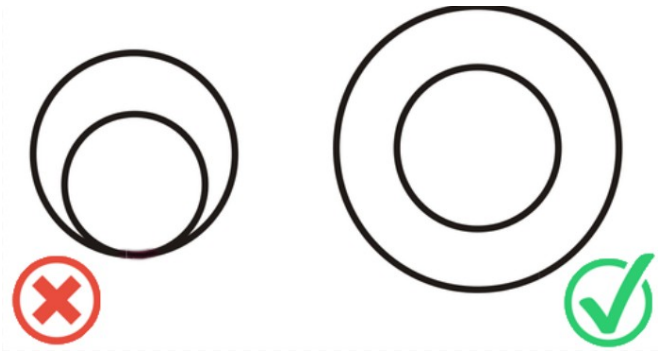
5. Continue tightening the muzzle break until it is seated flush against the top surface.



6. Visually inspect leveling while rotating the crescent a full 360°, and check alignment along the bore.



Note: When checking concentricity, if you see that the various circles along the bore do not line up concentrically, you may attempt to gently ‘correct’ the alignment while it is still warm, however you may risk improperly seating the muzzle device in your Crescent.



7. Let your Crescent cool until it is at room temperature. You may want to consider putting it into a slightly warm oven to cool. (Preheat for one minute.)

   Your work is now complete.

PLA.BOI'S EPOXY REINFORCEMENT (PBER)

1. Mix the epoxy compounds together.

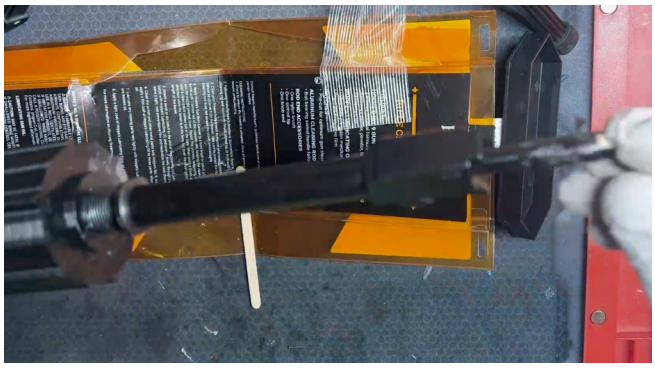
2. Thread the thread changer into the crescent before applying the epoxy, to ensure the threads are correctly in place.

3. If your barrel is greater than 6in, attach the thread changer onto a barrel. This will make the process easier.

4. Apply the mixed epoxy to the inside of the walls with a stick. You do not need to coat the entire surface, but cover a good portion of it.

5. Optionally, insert the 5/8” or 10mm wooden dowel into the thread changer / barrel combination. This will assist in ensuring that it remains concentric during the process.

6. Optionally, bring the threads to the entrance of the opening, and push the wooden dowel through as far as you can.



7. Begin twisting clockwise to thread the thread-changer into The Crescent.

8. Once the thread-changer is close to flush, or once it is too difficult to turn, use a wrench and turn it until it is fully seated into The Crescent.

9. If applicable, remove the wooden dowel. Unscrew the barrel from the thread changer. Let the epoxy cure for the required time stated on the label.

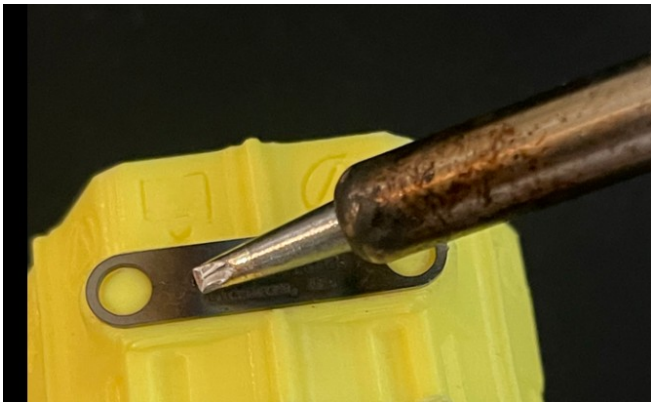
   Your work is now complete.

MAF PLATE INSERTION

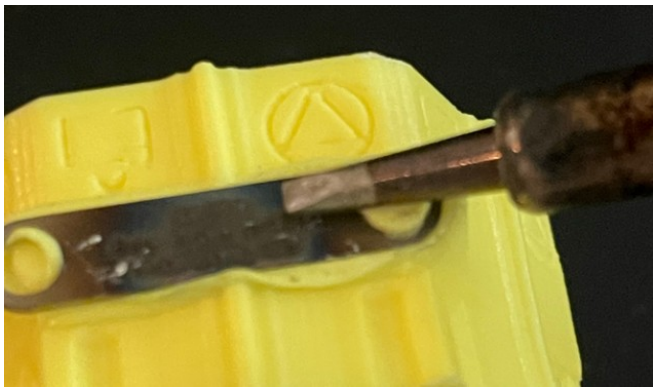
1. Place the MAF plate on the top portion of the neck. It should fit somewhat into the two raised circles.

2. Turn your soldering iron on and let it heat up.

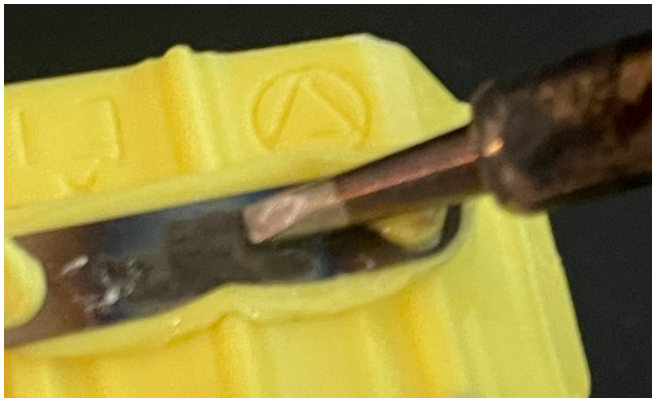
3. Gently place the tip of the soldering iron onto the plate. Start in the center, and work your way around the plate. Take care to lift the head when moving it, and hold it still when its touching. This will prevent accidental scratching of the plate.



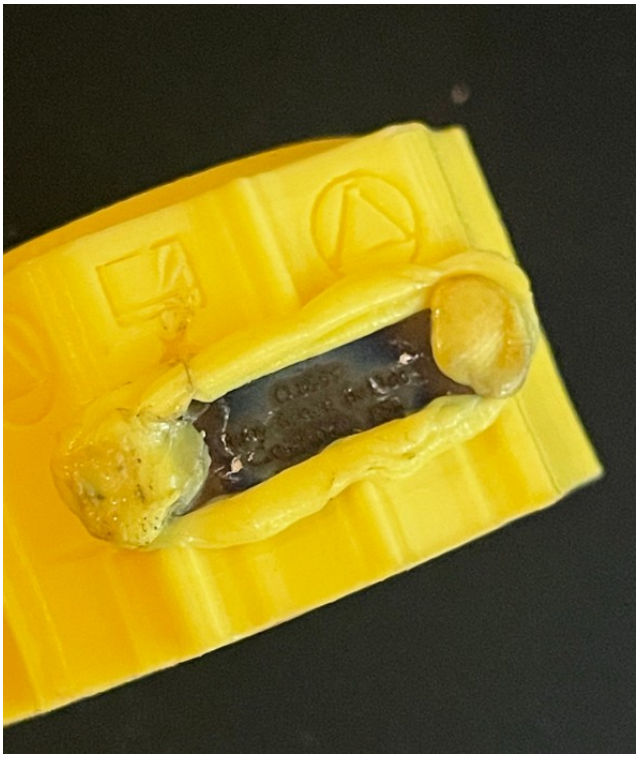
4. As it heats up, you will see plastic extrude through the holes and lift around the edges. Continue to work the tip around the plate, ensuring all parts get to the proper temperature. You may apply slightly more pressure.

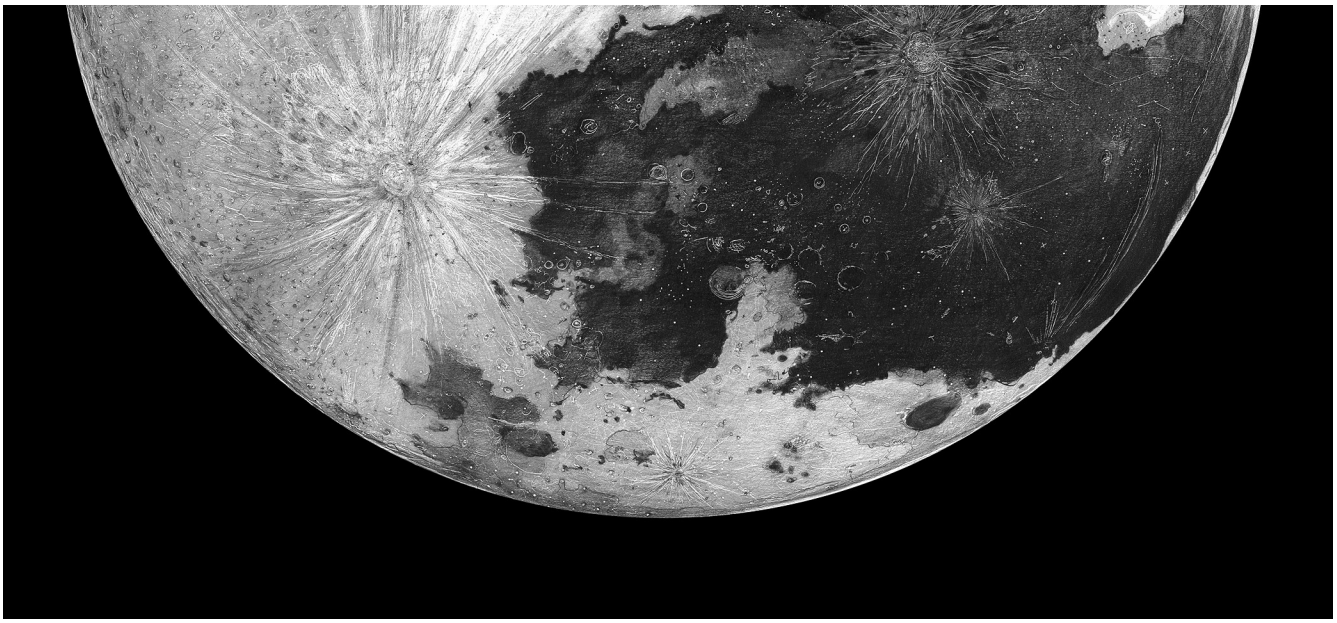


5. Once you believe there is enough material extruded in and around it, you may remove the soldering iron and set it aside.



6. Using a tool, compress some of the extruded material on top of the serial plate, encasing it within the plastic. Take care not to cover up any of the lettering!





DISPOSAL

If, for one reason or another, you decide that you need to destroy your Crescent and any tangible evidence of its existence, the most effective methods involve high heat or fire. Remember, if there is no record of an object existing, it never existed!

Due to the messy nature of melted plastic, toxic gaseous byproducts, and other risks associated with fire, we recommend completing these processes outside.

Generally, PLA and its closely associated alloys, like eSun PLA+, burn cleanly and produce little smoke when sufficient oxygen is available. Within in hour, it should become unrecognizable, but it will take a while longer for the plastic to burn completely.

In the event of a failed print or failure during post processing, the best method for disposal is a simple process:

- Place the failed print upright on a raised metal grate, preferably outdoors.
    - Four upright bricks underneath the metal grate will provide adequate height. Light a small fire underneath.
- Your unwanted Crescent will melt into a lump of plastic.
- Once it is thoroughly melted, remove the remains from the grate or extinguish the fire.
- When the remains are cool enough to handle, break them apart into further pieces.
- Dispose of the remains accordingly.

COMMON QUESTIONS

Q. WHAT IS WITH ALL THE STUFF ON THE SIDES?

A. The sigils are derived from the layers of the gyro-baffle as it prints. On top of that, I thought that the 90 angles, as well as the variations in the surface might help slightly improve durability. It made sense in my head.

Q. WILL IT *EXPLODE?*

A. Normally I would urge you to reread the ‘About The Crescent’ section, but since you are already here, it is designed so that, in the event of a catastrophic failure, rather than ‘explode’, the print will fail along the layer lines, and the body will project forward a number of feet. This renders it relatively safe for the shooter and anyone adjacent to them.

Q. WHAT ABOUT OTHER CALIBERS?

A. We tested The Crescent with other calibers, including 300BLK supersonics. Results were mixed. With smaller calibers, we had no issues. However, the results did not give me enough confidence to publish other calibers yet.

Q. HOW’D YOU EVEN COME UP WITH SOMETHING LIKE THIS?

A. Being an Autistic Trans Chaos Magician has its perks!

Q. NO BUT REALLY...

A. My focuses are in logical thinking and art. I am skilled in identifying problems, planning out a solution, and executing a design. My engineering knowledge is a bit rudimentary, in contrast. Because of that, as well as my lack of overall firearms knowledge, I let my imagination and the limits of my

computer, take the lead. Who says the humanities are useless?

Q. OH, SO YOU'RE POOR.

A. I am rich in other ways, but yeah, that is one of the reasons I started this project in the first place.

Q. IS THERE ANY WAY I CAN DONATE TO HELP YOU OUT?

A. That is not necessary, but it is greatly appreciated. I only use Monero.
Wallet ID: 8BjBoT1eDZrDMgjTpDR68DNbaAc6HqXFnUMureVhucMqWjZ8ZYVoU2WUP5RtTVTkA6fiuenQvHaDDG3Hw3N45oJEPMGkEUr

Q. WHEN I TRIED SCREWING THE CRESCENT ONTO THE MUZZLE DEVICE DURING THE HEAT REINFORCEMENT THREADING PROCESS, A BUNCH OF STRING CAME OUT, AND IT WON'T GO IN ANY FURTHER, WHAT DO I DO?

A. Oh, you poor thing. It seems as though you attempted to thread it before it was at an appropriately hot temperature, and you stripped the sides. You have a few options. The simplest solution is properly disposing of your print and printing another. The most dangerous solution is simply holding the crescent in place while you shoot. It will work, but I do not recommend it. If you happen to have a 3D-printing pen, you can extrude material onto the walls, and try to replace the material that you stripped, and repeating the heat threading process. Since the process reheats and crystallizes some of

the plastic, this solution may work well enough to fix the issue in a pinch.

Q. I SHOT THE CRESCENT AND SAW A FLASH ON MY FIRST SHOT. WHAT GIVES?

A. That flash you saw was the oxygen within The Crescent burning away. It is the same reason why most cans are louder on the first shot compared with subsequent shots. Nothing much I can do there.

Q. ARE THERE ANY OTHER WAYS I CAN MAKE IT STRONGER?

A. You can try a more heat resistant material such as Nylon-CF or ASA. During the course of the beta, we brainstormed a number of ideas to increase The Crescent's strength, however most ideas remained simply that, ideas. One of the more interesting suggestions came in for form of electroplating the PLA+, which is completely viable with the proper set up and enough India Ink. You could also try coating the inside/outside with epoxy to help with rigidity and heat resistance, however it may cause clogging within the finer areas within the Crescent. Pursue at your own risk.

Q. HOW DO I PRINT THE CORONA?

Q. Same as The Crescent.

Q. CAN I PUT MY DICK IN IT?

A. Free Men Don't Ask.
Read @Vega_Holdings' guide to learn more.

RESEARCH AND DEVELOPMENT

The design of The Crescent is unique in its appearance. It is the culmination of countless solutions to various problems, both encountered during the planning stages of its design and during the course of the beta testing process. Given the radical departure in its design as well as the resulting efficacy in its use, I believe it is necessary to give my best explanation of my various design choices.

Fundamentally, a firearm silencer disrupts the flow of gasses which propel a bullet out the barrel. Traditional baffle designs disrupt flow by trapping the gasses in the empty pockets between the baffles. This design works well, but it has two significant issues. It causes a noticeable volume of gas to return through the barrel and into the receiver, an experience I learned is *very* unpleasant. The design also experiences heat buildup, another significant issue. When the hot gasses are trapped, the material absorbs much more heat. Under most circumstances, for a metal silencer, this is not a considerable issue. For a PLA+ silencer, made from the material most commonly used by the GunCAD community? That is a critical issue.

I started the design of The Crescent because I wanted a silencer for my newly built 9mm Pistol Caliber Carbine (PCC). However, my disposable income is limited, and the purchasing cost of a silencer is more than I paid for any of the firearms I already owned. That is before accounting for a $200 National Firearms Act (NFA) tax stamp. Instead, I considered of the option of making my own. At that point, I recently engaged the GunCAD community, outside of simply viewing the occasional post on my Twitter feed. I investigated the publications on The Gatalog at the time, and the more research I conducted, the more I questioned, “If I’m going to spend $200 to legally make this thing anyway, *why not make my own?”*

Thus, I began my journey to learn Computer-Aided 3D Design (CAD). I also requested assistance from the Deterrence Dispensed Rocket Chat website on their

development channel, asking if anyone had any resources on the design of firearm silencers and the physics behind how they work. A user named @Ethan.Hall linked me to a number of fantastic resources, and one particular document caught my interest.

This document became the foundational spark of The Crescent's design. The version of The Crescent we released shares similarities to the original design submitted to the beta, however, with some kind assistance from the beta testers, we developed it into what you have a copy of today.

OPTIMIZATION AND HOLISM

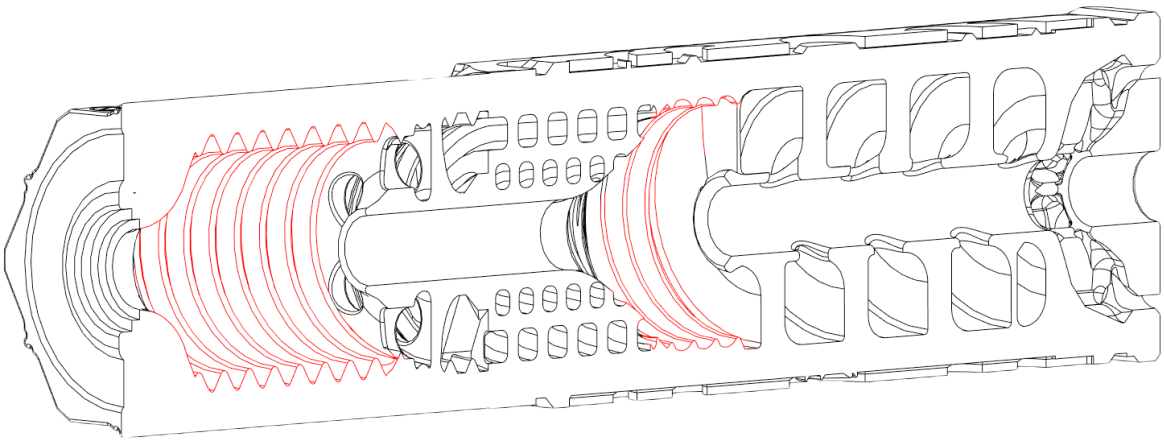
Assuming one has access to a perfectly leveled and functioning Creality Ender 3, there are a variety of factors that affect the integrity of a print. It is not just these individual factors, but the ways in which they interplay and affect one another.

In any fully printed design with multiple parts, this relationship is most apparent when differentiating the resulting structural integrity between the different pieces. For a print such as The Crescent, where its design is reliant on certain constants, like vertical print orientation, solid infill, and no supports, for example, the number of adjustable variables is more limited. This enables a more consistent output between different printers and environments. I do not intend that everyone will have the exact same results, but these constants should help everyone to remain in the ballpark.

There is only one part to print, and once it hits the printer, *that is it*. If you are going to complete the process and pay the cost of a tax stamp, it better be worth it. This concern required me to snuff out any potential breaking points or weaknesses and negate them as best as I could, in a theoretical space.

I never ran any kind of CFD simulations on The Crescent's design during its development, despite my best efforts to the contrary. I did, however, run simulations in my head. Based on principles and assumptions, I visualized how the expanding gasses would behave and how they would flow through the system. I also considered where the most vulnerable parts of the system were, and what we could do to manage their eventual wear. This repeated revision process led to the creation of various elements which I believed would benefit the system as a whole. This repeated revision extends to the external geometry as well, and the final result is quite gestalt in its design.

THE BLAST THREADS



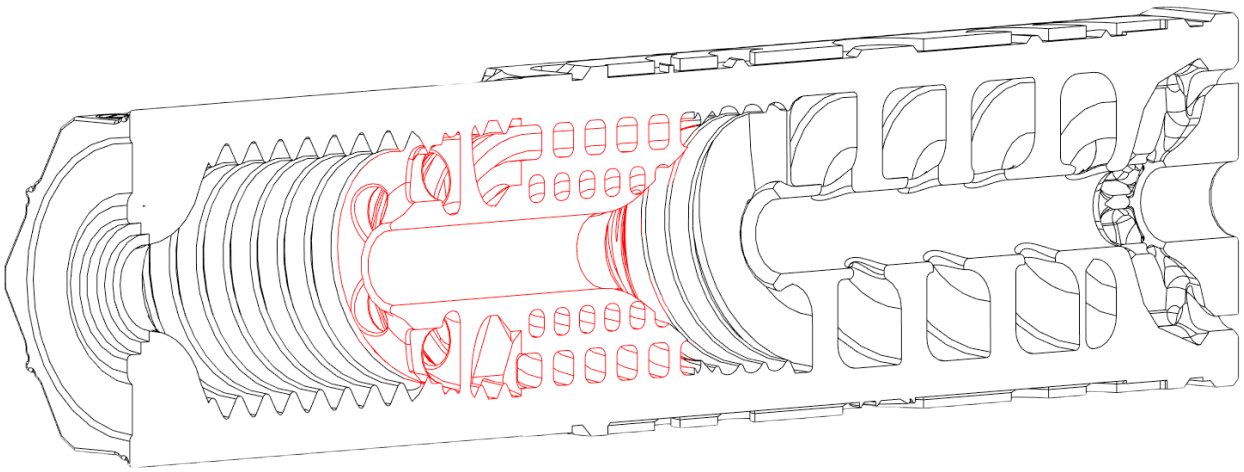
Blast threads are a design innovation created specifically for 3D printed muzzle devices. They serve a multifaceted purpose, some of which are more straightforward than others. I designed the blast threads in order to maximize the amount of surface area per layer while also minimizing the reduction in volume.

To a degree, the blast threads also serve to force expanding gasses along the grooves. In a printed blast chamber without the blast threads, printed in the same orientation, it is imaginable that the forces of the blast could cause some small imperfection along the wall to grow, eventually leading to a catastrophic failure. During the course of beta testing, the testers reported incredibly few failures along the portions of the blast threads. The only frequent point of failure was at the threading cap where the threads begin. This issue only occurred when testers tried firing 300BLK supersonics, as well as 7.62x39, either after one shot, or a few.

A theoretical benefit of the blast threads and its conductivity to annealment through use is that they reduce the prevalence of limp through heat absorption. Given the blast chamber experiences the worst of the heat from the gasses, the walls within it will absorb the brunt of the heat. Whereas the threads comprise the majority of the surface area within the blast chamber, those areas will reach the crystallization point first.

I only recently considered the possibility of ‘breaking in’ The Crescent. By that, I mean some specific regiment of use and subsequent resting period. Theoretically, it would allow for the blast chamber and other portions to experience some level of annealment, increasing the total strength of The Crescent without as great a risk of damage through warping. The details of such a process remain unknown at this time.

‘RUBY’S GYRO-BAFFLE’

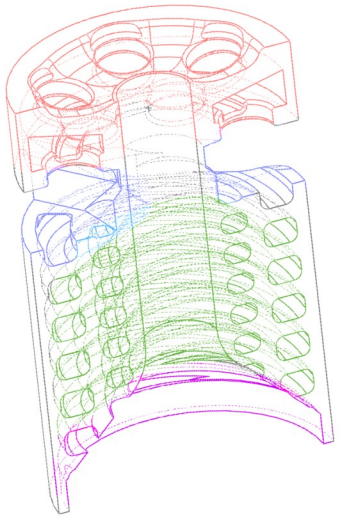


The heart of The Crescent is what I dub ‘Ruby’s Gyro-Baffle’, or the ‘Gyro-Baffle’ for short. To my knowledge, there is no other design or concept like this within the GunCAD sphere or the wider firearms industry in general. I attribute the former to the lack of development on silencer tech (until recently) within GunCAD, and the latter to the lack of profit incentive. Luckily, I made this for *fun*.

The elements that compose the Gyro-Baffle are not necessarily new in-and-of themselves. However, I believe the way I integrated them together into a singular atomized package qualifies as a novel development within the GunCAD sphere.

Its primary purpose is to stand as a blast baffle that absorbs the brunt of the explosive gasses and debris, while also limiting, though not completely halting, the flow of expansive gasses through The Crescent.

Ruby's Gyro-Baffle consists of four stages:



(1) Two Biconvex Disks with overlapping Sextic-Ports.

(2) Split 'Atriums'

(3) four 'Capillaries' (two clockwise; two counterclockwise)

(4) Transfer–Zone

The gasses exiting the barrel first encounter (1). The curvature of the face is intended to help direct the gasses towards the Sextic-Ports, rather than down the bore with the bullet. From there, the gasses enter a second holding space, with space for gas to continue to expand. The gasses directly entering the first set of ports are intended to hit the second face, disrupting the flow and causing turbulence. Needless to say, this portion takes the most physical abuse.

Next, the gasses will enter (2). The two atriums are split by two walls, both intended to help direct the flow of gasses into the next section. The wall also helps reinforce the baffle as a whole, creating a bridge and allowing for greater structural integrity. The geometry of the atriums also allows room for further turbulence and the remixing/recycling of gasses into the space while also directing the flow through the system. In essence, this is the 'baffle' part of the Gyro-Baffle.

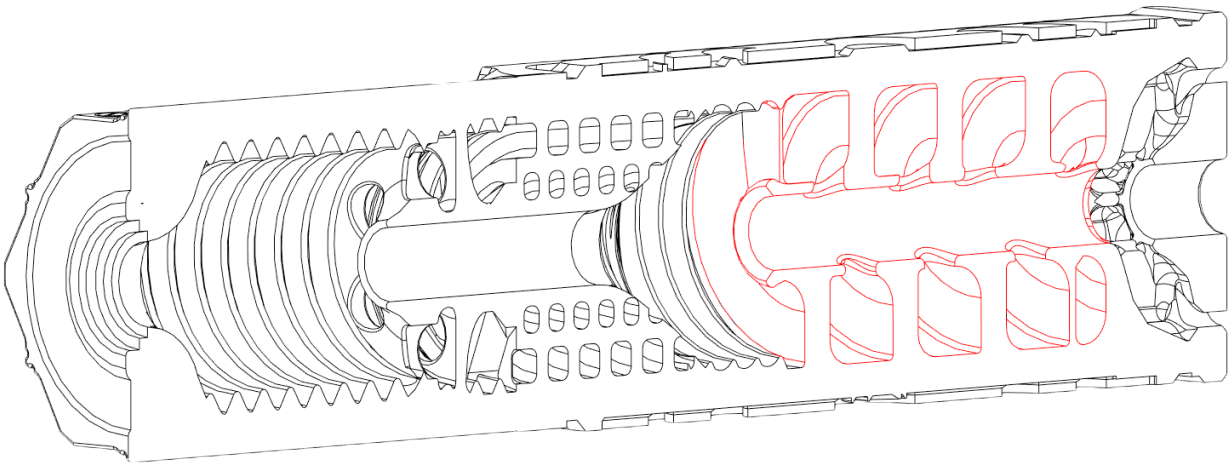
The gasses then enter (3), the 'gyro' part of the Gyro-Baffle. This is probably the most important element to the system as well as The Crescent's overall design for three reasons. First, this section of The Crescent has the greatest and most continual

surface area, along the Z-axis, out of any other section, aside from the very top. Thus, it acts as one of the strongest sections in the entire body. Second, the capillaries allow the gasses to vent from the atriums, thus reducing the buildup of heat and pressure within the blast chamber. Last, the rotation of the gasses and increased travel area over a small period of time further reduces the energy of the gasses, resulting in a reduction in sound pressures.

The final section (4) is, in my humble opinion, my most clever aspects of this design. The convex divot carved into The Crescent is intended to reduce the prevalence of stringing while printing, due to the lack of supports. It also serves the purpose of directing the gasses ‘inward’ with the intent of having the directional energy of the two directions of flow cancel one another out in the middle, creating turbulence, and hopefully disrupting the further flow of gasses that may be following the bullet's path.

Once again, this is ‘theoretical’, as I have not done, nor witnessed, any CFD testing with The Crescent yet. However, over the course of beta testing, the area around the Gyro-Baffle demonstrated itself as one of the sturdiest sections of the design. Using the design principles and elements laid out here, I believe the core principles of this design is adaptable for a variety of calibers, shapes, and so forth.

SPIRAL EXPANSION BAFFLE

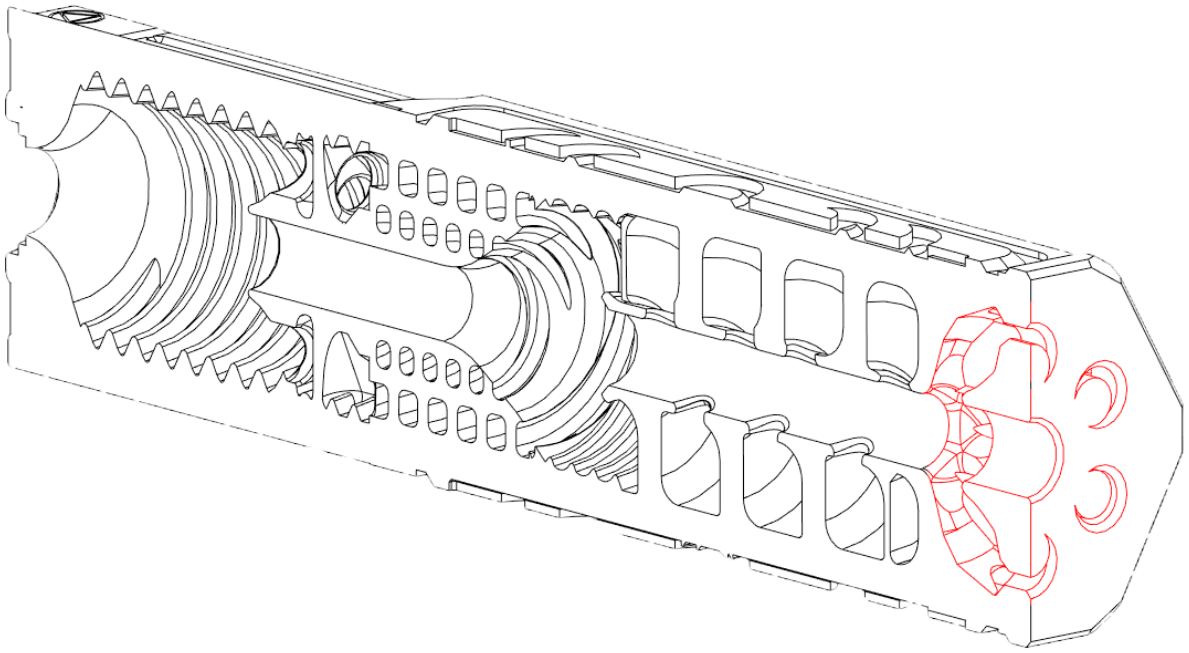


The Spiral Expansion Baffle is the secondary mechanism by which The Crescent slows gasses. The design uses the same thought process from other flowthrough designs. However, what differentiates The Crescent is that the gasses do not necessarily ‘flow through’. The wall at the bottom between the Spiral Expansion Baffle and the diffusion ports is solid.

The only gas exits are along the inner wall and direct the gas along the path of the bullet. The positioning of the ports aids in the expansion of gasses and creates turbulence through gas recycling through the system, causing the gas to expend energy while varying directions.

This component is rather simple, and through that simplicity it is well suited for the realm of FDM printing. It is also the only element within the design that is not symmetrical along some of the primary axes. All other spiral-based elements are mirrored to a degree. Consequently, The Crescent is inoperable from an incomplete model.

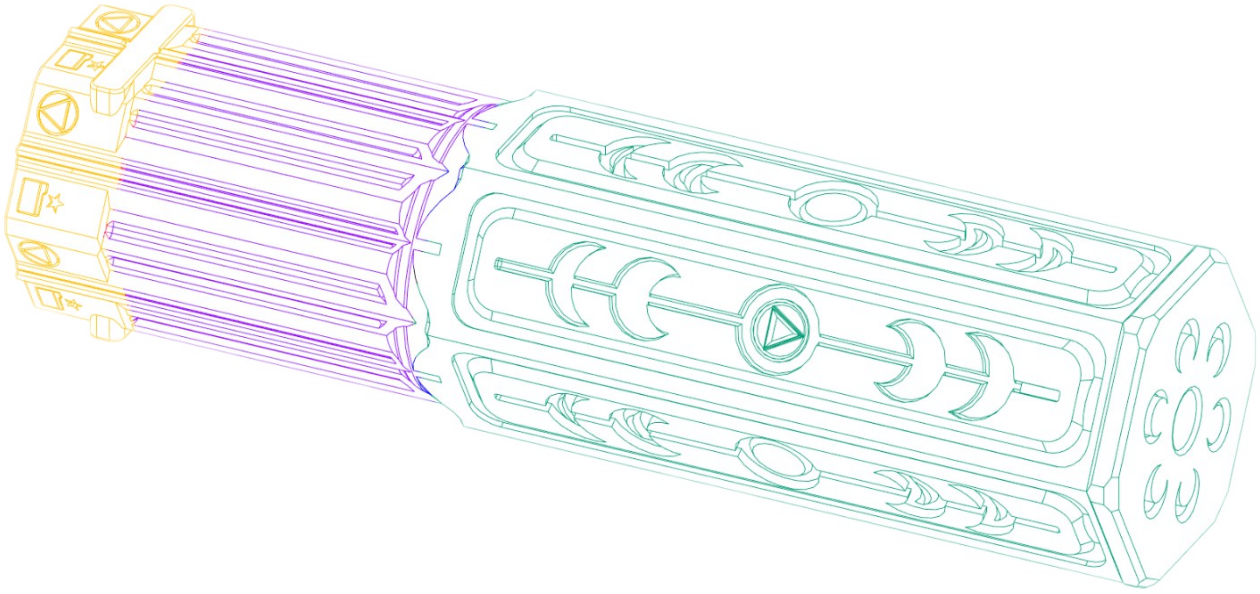
DIFFUSION PORTS



The ‘face’ of The Crescent so to speak, the Diffusion Ports are the only true ‘Flowthrough’ element of the design. The purpose of these ports is to allow gasses to continue their expansion before finally exiting, thus helping reduce the overall pressure as the gas finally leaves.

Because the Diffusion Ports are located at the very front of The Crescent, as well as the segmentation of the chambers, this is the first portion likely to experience damage. However, because the Spiral Expansion Baffle is not ‘directly’ connected to it, any damage from a baffle strike is not likely to *significantly* impact the performance of The Crescent. A baffle strike will impact the performance of The Crescent, but, as a whole, it should continue to function as intended.

EXTERIOR



The external geometries, like the internal, are a bit of a departure from traditional designs. There are three major faces: the throat, the neck, and the body.

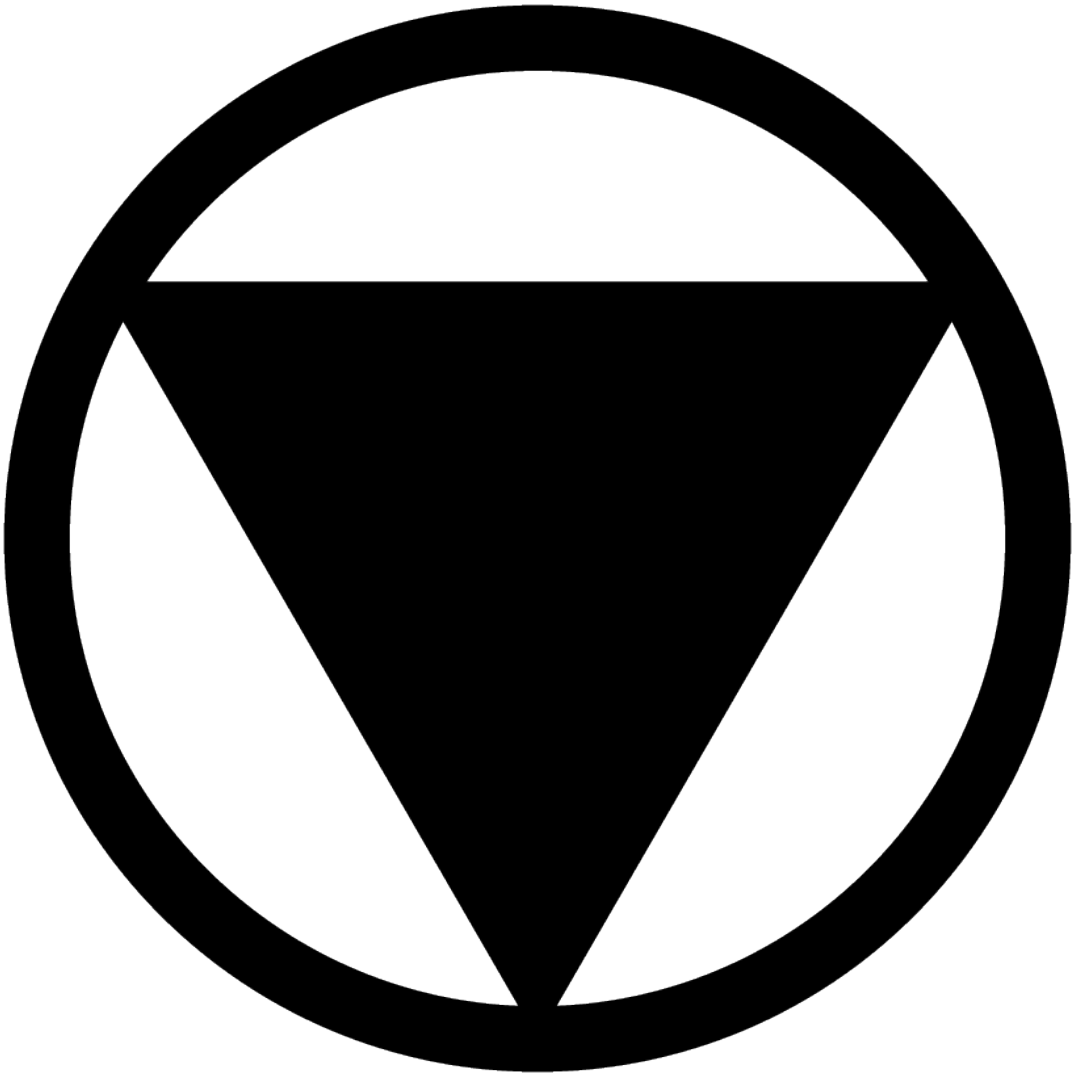
The throat is the very top of The Crescent. The flat panels are for the MAF serialization plates. The markings are of the Deterrence Dispensed logo as well as the *Thaumaturgic Triangle*.

The neck is the most novel element of The Crescent's outer geometry. I designed the grooves in a 'fractal' fashion. The intention of which is to increase the total surface area of the outside section. The effect of this design choice maximizes the dissipation of heat from the area of the blast chamber as a whole. Thus, in theory, it reduces limping.

The body of The Crescent is a sigil, or an enchantment if you will. The negative space of the Gyro-Baffle's capillaries produces the same sigil along the top surface during the course of printing. The inside and the outside reflect one another, in this regard.

WHAT'S WITH THE TRIANGLE IN THE CIRCLE?

Well, it has a few meanings for me. Primarily, it serves as my personal design sigil. It is based on the thaumaturgic triangle. Thaumaturgy being the act of performing miracles. Given how well The Crescent performs, I think it is fitting. It is also intended to invoke feelings of the pink triangle, which is intentional, since I myself am Trans and Queer. Most importantly though, it represents a color wheel with a triadic color scheme, with one such scheme being red-blue-yellow, or RBY.



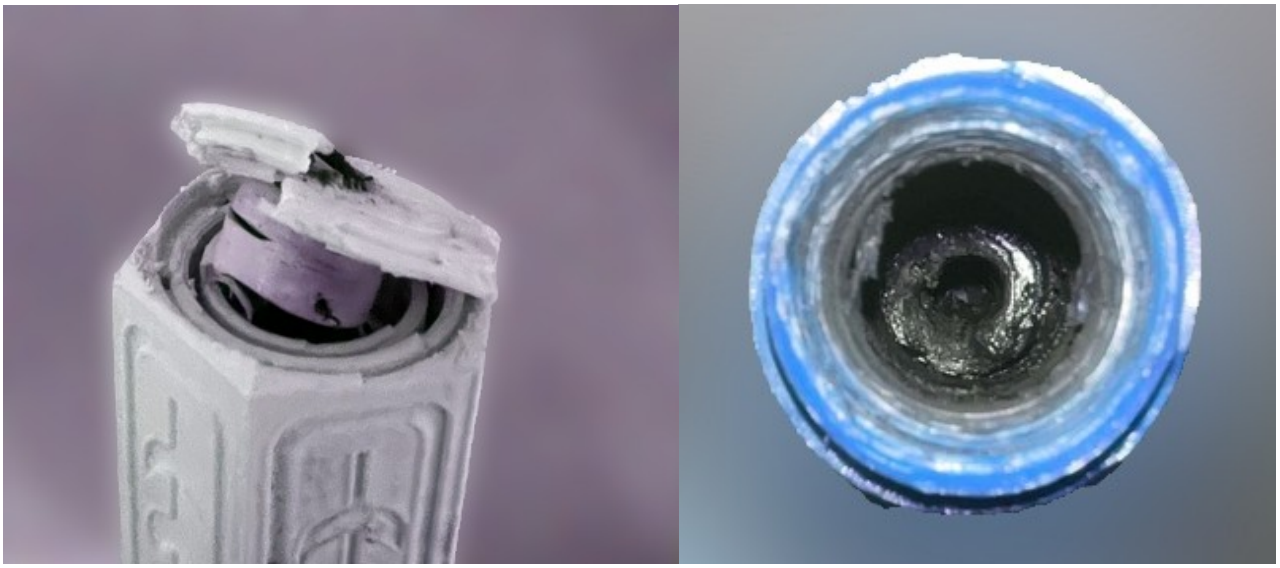
THE BETA PROCESS

The Beta ‘officially’ began back in November of 2022, and it had two primary purposes: to test The Crescent’s efficacy at noise reduction and to test the limits of its durability and integrity. The purpose of this section is to elucidate how the beta progressed, what was learned, and how things changed along the way.

Normally for Deterrence Dispensed / The Gatalog beta tests, all that the administrators require to start a beta is evidence of a single, safe operation. However, for a silencer project, we set the bar a bit higher. Our goal was to have it survive around one hundred rounds with no restrictions in terms of the frame of time really given. I informed my alpha tester of what their target was, and they decided “fuck it, we ball.”

They sent me a video firing off a little more than three extended magazines of 124g supersonic 9mm before failing around 100 rounds. The video depicted a time interval between of around 1-2 seconds at the beginning and a steadily increasing pace as it goes on. They also mag dumped for most of the 3rd magazine.

The way in which it failed I found shocking. One would think, considering how thin and narrow the walls of the neck are, that it would separate there at some point, but it did not. The ‘cause’ of the failure was in the neck, but it was a design flaw alone which did it in. The culprit was the heat. It is a miracle that it lasted as long as it did, given the difference in the amount of material in the body and in the neck. The reason for this design choice was so that it would fit within a free floating handguard, however after seeing those results, I abandoned that design intention in favor of durability.



These are two pictures I received from the alpha tester. On the left, the front face was dislodged by the baffle strike, but not separated entirely. The testing came to an end after it was completely ejected from the end of the barrel. You can see damage from the path of the bullet as it struck the baffle on the right.

I shared the video with the Deterrence Dispensed / The Gatalog admins, and the beta testing began.

THE BETA'S PROGRESSION

BETA: Phase 1

One of the first, and biggest questions that I hoped to have the beta answer is *"Just how good of a suppressor is it?"*

The best answer I am able to give, based off of the data collected by the Beta Testers is:

"We don't know for certain—turns out Amazon decibel readers aren't the best tool for figuring that out and the tools required to get them were too costly. But hey, it sounds really good for the shooter, and it lasts!"

The numbers recorded by the testers were too good to be true and promptly discarded. Hopefully, now that The Crescent is published, I hope someone with the proper equipment can get us a better answer.

BETA: Phase 2

Once we set aside the question of efficacy, the next question was durability.

The Crescent's design was nearly at its final iteration, and most of the features to combat limping were implemented. This was the limit testing. Here is what we found:

—If one fires continually for ~100 rounds, there is a large change a baffle strike will occur, however, that does not mean catastrophic failure.

—Because of the design, even with substantial damage to the interior from Baffle Strikes, it will still 'function' as intended to some degree.

—If The Crescent experiences a catastrophic failure, the design ensures the safety of the shooter, as well as any adjacent bystanders.

—If, for whatever reason, the threads strip due to heat or failure to properly

thread, for 9mm ammunition, one can hold it with their hands onto the muzzle, with minimal degree of danger to the shooter. The Crescent will, however, experience significant damage to the insides. **WARNING: IT IS NEVER A SAFE IDEA TO PLACE ANY OF YOUR APPENDAGES AHEAD OF THE MUZZLE OF A FIREARM. IT IS NOT ADVISED TO HOLD THE CRESCENT WITH ONE'S HANDS DURING USE, BUT IN AN EMERGENCY SITUATION, IT WILL WORK.**

—The Crescent is able to withstand mag dumps with subsonic 300 Blackout. Supersonic 300 Blackout resulted in immediate catastrophic failure, originating at the very beginning of the blast chamber. The main body of The Crescent was ejected approx. 20 feet away.

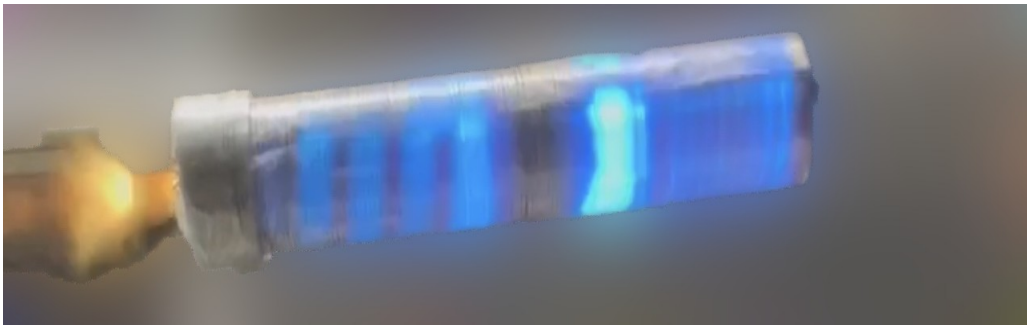
—Heat Threading is a near universal mounting solution. However, epoxy and a thread adapter is the best method for preventing baffle strikes from occurring during sustained use.

—The first shot with The Crescent attached may produce a flash signature, however after that point, no flash signature is detectable in the dark.

—The Crescent will not cycle on non-fixed barrel pistols due to its weight. However, if the pistol utilizes a fixed barrel, The Crescent will work.

—Removing The Crescent immediately after use appears to result in increased warping, due to the more rapid change in temperature via the release of hot gasses from the top.

—With a 1mm nozzle, an entire Crescent is printable in about half a day. However, it may result in increased warping during operation.

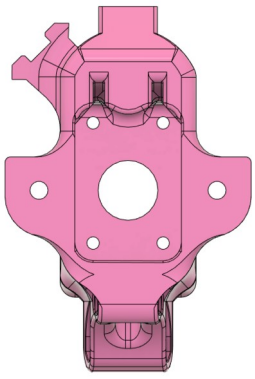


The fireball in the photo comes from the initial burning off of the oxygen within the body.

Something interesting to note here is the illumination within the atrium of the Gyro-Baffle. This Crescent was attached via the Epoxy Method, and so (1) serves as a true sacrificial baffle. An advantage of a muzzle break over the epoxy method, is the integrated sacrificial baffle. I should note that that if one truly wanted to, they could heat thread a Crescent with a muzzle break, and then epoxy the two together permanently to reduce the chance of a baffle strike. Please note: this will alter the final height of The Crescent, so plan accordingly.

BETA: Release and Future

In truth, the beta is not yet complete. My largest goals for The Crescent were accessibility and adaptability. I designed a version of The Crescent capable of being mounted onto an unthreaded FGC-9 MKII, by way of bolting it to a custom handguard.



Unfortunately, none of the beta testers had access to an unthreaded 16mm DIY barrel for the FGC-9 MKII. If they had one, the barrel was a Glock or AR9 barrel. On top of that, the handguard I designed looks like an *actual clown face.*

I swear, I didn't mean to this time.

I reached out to two other developers, much more skilled than me, asking if they could assist in ‘refining’ my design into something actually good or helping me to design an alternative means of mounting it to the handguard themselves.

I was a bit disappointed that one developer never bothered to respond to my attempts to get in touch *at all,* and the response from the other developer was so funny, telling it here would not do it justice, but they never contacted me directly regarding it.

So, I decided to release the Epoxy and Heat Threading versions of the RGB-Crescent and continue the beta until we get confirmation the handguard mounting method works.

NOW WHAT?

There are a number of other projects and ideas cooking up within the beta. During this time, I also reached out to other silencer, and silencer adjacent, developers and theorycrafters, and we began talks on several different ideas and projects amongst ourselves within the beta room.

We currently have a DIY piston, as well as a new QD system in the works. There are also a variety of other silencers in the works by myself and others. At the moment, I myself currently have:

- A Solidbody design intended for 5.7x28mm
    - (currently in Alpha)
- A Solidbody RGB design intended for .223/5.56
    - (currently in Prototyping)
- A Solidbody RGB design for the Urutau
    - (currently in Early Development)

Another developer within The Crescent beta has their own beta beginning which utilizes an AR buffer tube in place of a solvent trap. In my humble opinion, this is the next big leap forward. Keep an eye out for it or join the beta if you are interested.

I plan on continuing to adapt and iterate on the Gyro-Baffle. I hope to make variants of it for use with various other common caliber sizes for further use by others. I also hope to specifically adapt the design for a solidbody design for the Partisan 9, so stay tuned for that.

If you have made it this far and you understood the words that I have written...

Thank you. I put my life into it.

——Ruby Grace

"I believe in static forms of beauty," he said. "I like to measure off things and then let them remain. I try to create degrees of silence. Things in this room are simple and static. They're measured off carefully. When I change something slightly, everything changes. The change becomes immense. My life in here almost resembles a certain kind of dream. You know the way objects in dreams sometimes acquire massive significance. They resound somehow. It's easy to fear objects in dreams. It gets like that in here at times. I seem to grow smaller at times and the room appears almost to lengthen. The spaces between objects become a little bit frightening. I like the colors in here, the way they never move, never change. The room tone changes though. There's a hum at times. There's a low roar. There's a kind of dumb brute chant. I think the room tone changes at different times of day. Sometimes it's oceanic and there's other times when it's just barely there, a sort of small pulse in an attic. The radio is important in this regard. The kind of silence that follows the playing of the radio is never the same as the silence that precedes it. I use the radio in different ways. It becomes almost a spiritual exercise. Silence, words, silence, silence, silence."

——DON DELILLO, *END ZONE*