

Sphynx

Assembly Guide

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CONTENTS

Section 1: Introduction.....	3
Section II: Tools and Shopping List.....	4
Section III: Parts Kit Checklist.....	5
Parts Needed.....	5
Magazines and Accessories.....	8
Parts Kit compatibility.....	8
Section IV: Definitions and Extra instructions.....	9
Definitions.....	9
Definition: "92FS":.....	9
Definition: "92 type M":.....	9
M9 vs 92fs:.....	9
File Variant Legend.....	10
How to chose which frame to print:.....	11
Print settings.....	11
Section V: Assembly.....	12
Safety first.....	12
Preparation.....	13
Fit slide and barrel.....	14
Assembly.....	16
Function Check.....	37
Section VI: Extra instructions.....	38
90-2 and 92a1 specific instructions:.....	38
92 Compact AND CENTURION specific items:.....	38
92 Type M Assembly.....	39
Section VII: Troubleshooting.....	39

SECTION 1: INTRODUCTION

This is a fully 3d printed Beretta 92/m9 frame that supports a variety of 90 series models.

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SECTION II: TOOLS AND SHOPPING LIST

To assemble this firearm, you will **need** the following tools:

- Gunsmiths Punch Set
- Flathead screwdriver

The following tools may help, but are **not required**:

- 3mm pin stock
- Metric Drill Bit Set
 - o 3mm Drill Bit
 - o 4mm Drill Bit
- File set

SECTION III: PARTS KIT CHECKLIST

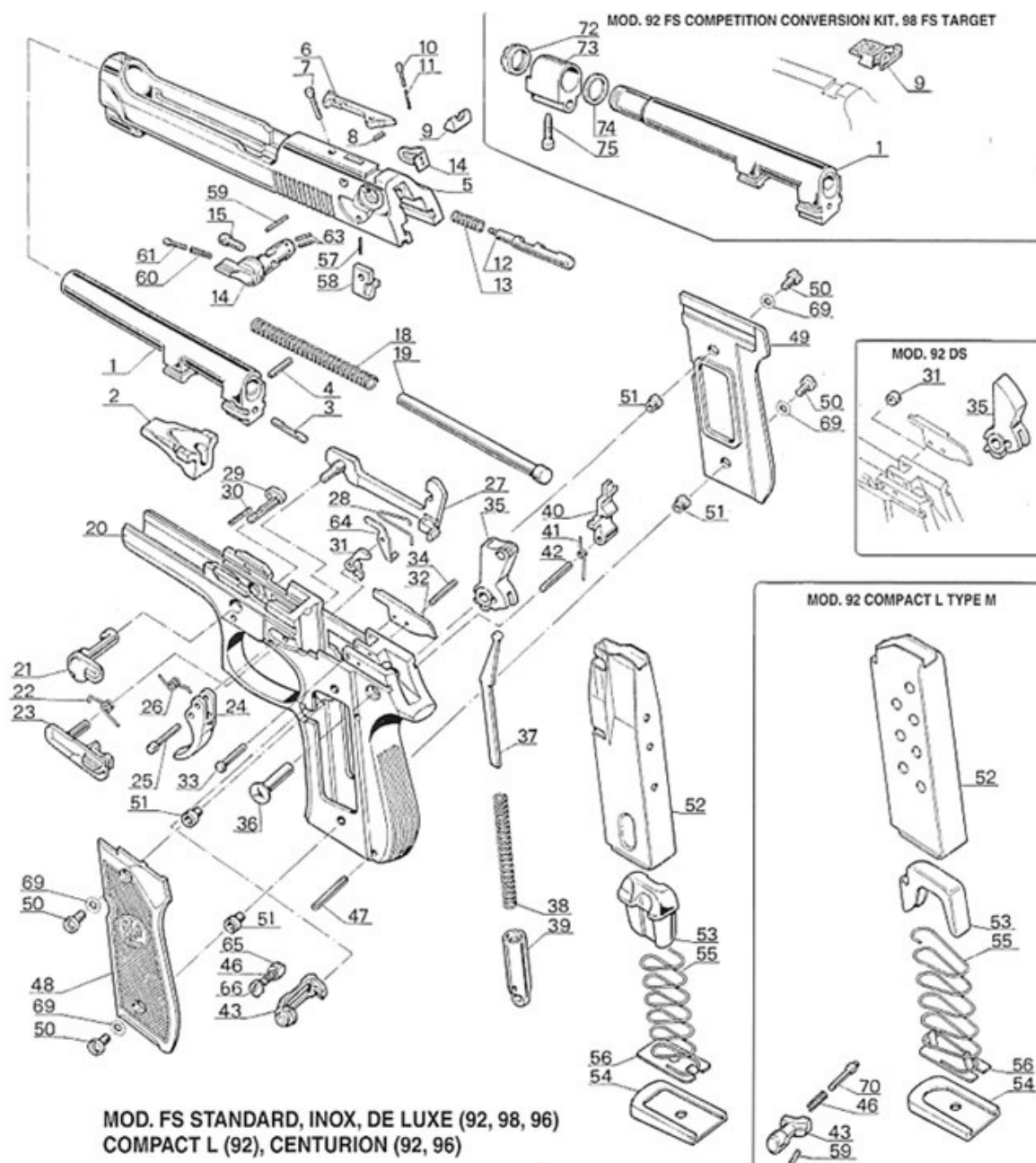
In order to successfully build your Sphynx...

PARTS NEEDED

A complete parts kit should compose of the following:

- x1 Slide assembly (Slide, firing pin, firing pin spring, firing pin block/spring, etc)
- x1 Barrel assembly (Barrel, Locking block, LB pin, LB roll pin)
- x1 Take-down lever
- x1 Take-down lever button
- x1 Take-down lever button and spring
- x1 Trigger
- x1 Trigger pin
- x1 Trigger spring
- x1 Trigger bar
- x1 Slide catch
- x1 Slide catch spring
- x1 Trigger bar tension spring
- x1 Sear*
- x1 Sear spring*
- x1 Sear pin*
- x1 Hammer
- x1 Hammer strut
- x1 Hammer spring
- x1 Hammer pin
- x1 Hammer spring cap
- x1 Hammer spring cap roll pin / dogbone solid pin / 90-2 oval pin
- x1 Decocker
- x1 Decocker/Ejector Pin (solid pin with head)
- x1 Ejector roll pin
- x1 Left grip panel
- x1 Right grip panel
 - printed grips or a ~~90-2 grip module~~
- x4 Grip screws (M3 Screws can work as a replacement)

92D models are missing their sear and sear pin due to being DAO. You can replace the hammer and install a sear, but you wont have a manual safety.



http://www.berettaweb.com/sezionati/sez_92FS.htm

https://www.beretta.com/content/dam/beretta-usa/user-manuals/90_Series_Manual.pdf

MAGAZINES AND ACCESSORIES

Don't forget you will also need:

- Magazine

You can print the following accessories:

- Grip panels
- Main spring caps: compact and standard

PARTS KIT COMPATIBILITY

- 92FS
- 92F
- 92S
- 92SB
- 92 Type M
- 92D
- 92G
- 92 Centurion
- 92 Brigadier (**from research not real life testing**)
- 92 Compact (on compact frame and full size)
- 92a1
- 90-2
- 96 and 98 variants of the above models
- Helwan 920 clone (with slight fitting)
- Girsan (with slight fitting on barrel rails)

Potentially more...

****Taurus parts are not compatible at this time****

****Any kit with a frame safety is also not compatible****

****92S kits do not have the firing pin block / trigger safety and cause the safety decocker to wiggle side to side. It does not seem to affect function but may cause uneven wear. Some parts kits have been noted to come with a plastic spacer to solve that.****

SECTION IV: DEFINITIONS AND EXTRA INSTRUCTIONS

DEFINITIONS

DEFINITION: "92FS":

This guide refers to 92FS multiple times. It is being used as shorthand to refer to "default" or "standard" specs. The 92FS being the most common pattern and as far as parts compatibility goes most kits can share a frame. i.e. 92fs would interchange with a m9a4, 920 helwan, 92f, or 92x (not performance) but not a 90-2 or 92a1. This idea is based on parts compatibility not the features of the frame. A M9a4 is different in features than a 92fs in metal frames, but can be installed in the same Sphynx frame.

DEFINITION: "92 TYPE M":

The 92 Type M is a single stack frame that shares most parts with the 92fs series. This does **NOT** refer to the M9 series, instead that would be "92fs". These are not common, you are unlikely to have a parts kit.

M9 VS 92FS:

The M9 is the same gun as a commercial 92FS, but sometimes with different frame features, like vertec grip profile or accessory pic rail. As far as this project is concerned a 92FS is the same as a M9.

FILE VARIANT LEGEND

Base File:

Base file: Supports 92FS and most frames (does not have an identifier)

C: Compact

M: Type M

O: 90-2 and 92a1

Modifiers:

A: smooth barrel shroud

B: pic rail under barrel

R: 93r trigger guard

G: 90-2 grip modules

N: 90-2 main spring pin

V: Vertec Grip

Resulting frames:

A: smooth barrel shroud 92FS style

B: pic rail under barrel 92FS style

R: 92FS style with 93r style trigger guard

CA: Compact with smooth barrel shroud

CB: Compact with pic rail

CR: Compact with 93r style trigger guard

M: Type M Compact

MR: Type M compact with 93r trigger guard

O: 90-2 and 92a1 with normal grips and normal style main spring pin
(use this if you have a 92a1)

ON: 90-2 with normal grips and 90-2 style main spring pin

~~OG: 90-2 with the 90-2 grip module and 90-2 style main spring pin~~

This model may be revisited in a later development and is not included.

AV: smooth barrel shroud 92FS style with vertec grips

BV: pic rail under barrel 92FS style with vertec grips

RV: 92FS style with 93r trigger guard with vertec grips

OV: 90-2 and 92a1 style with vertec grips. Uses a standard main spring pin.

ONV: 90-2 style with vertec grips. Uses a 90-2 style main spring pin.

HOW TO CHOSE WHICH FRAME TO PRINT:

1. Figure out which kit you have. if its not a compact, Type M, or 92a1/90-2 you will choose the base file variant (no modifier letter).

2. Ask yourself if you would like to stray from the original kit. Like not using the 90-2 grip modules, or putting a compact kit into a full size frame.

3. Ask yourself which features you want. i.e vertec grips, pic rail, larger trigger guard. You will chose the frame based on these decisions.

i.e. I have a compact lower and upper, but decided to print a full-size frame with Vertec grips and no pic rail. I would choose the AV frame.

PRINT SETTINGS

- .12-.2 layer height. ,12 or .16 is preferred.
- 100% infill
- 6-10 walls
- magwell on bed nose up 25 degree. The STL file should already be in this position. **DO NOT DEVIATE FROM THIS ANGLE.**
- Tree supports are helpful but tuned normal supports also work well.
 - Support is needed under the beavertail and pic rail. Supports under the magwell also help hold the frame steady while printing. Paint on settings can help greatly with targeting those.
- PLA+ filaments and blends that sag more can cause issues with how the rails print causing fitment issues. It will likely increase the post processing needed.

SECTION V: ASSEMBLY

In this section, we will cover the settings you should print your frame and assembling it.

SAFETY FIRST

Putting a gun together is no joke. Firearms are dangerous tools that must be treated with care and respect. **You are responsible for your safety, and those surrounding you** when you work with or operate firearms. Fellow developers or engineers cannot be responsible or liable for what you do or don't do.

As a general reminder, here are some rules to keep in mind:

1. **Always treat a gun as if it is loaded.** Remove the magazine and check the chamber yourself to verify the gun is unloaded.
2. **Keep your firearm always pointed in a safe direction.** Never point your gun at anything you don't intend to destroy.
3. **Be aware of what is in front and behind of your target.**

But specifically, for working on your firearm, you should remember the following too:

1. **Keep live ammo away.** Use snap caps or dummy rounds to verify function of your firearm. Never keep live ammo around your workspace, and certainly never mix them with your dummy ammo.
2. **A clean gun is a safe gun.** Never leave your firearms uncared for to foul or dirty up. Debris can cause malfunctions, which can be dangerous.
3. **Always read and follow directions.** Don't ignore a warning or follow instructions out of order.
4. **Use prudent judgment.** If something doesn't add up- use common sense. Stop, inspect, and re-evaluate your previous actions and procedures.

PREPARATION

Clean up any supports, print burrs or strings. This includes clearing holes to be round and to size on the tops and bottoms.

Use a round file for the take-down pin hole. You can use the parts themselves to check that they operate smoothly.

Photos below are also included in the package for easier viewing.

FIT SLIDE AND BARREL



Fit the slide without the barrel.

The slide should fit without much effort, depending on the how the under hangs printed.



Fit barrel to frame without slide.
It should slide in the rails without much resistance.
Keep the locking block pulled upwards otherwise it will bind

Remove when done.

ASSEMBLY

Assembly is nearly the same as a real 92 aside from normal post print cleanup. Normal tear down and rebuild videos of 92 will guide you in the right direction. Below is one I've watched before and it should cover most questions.

<https://youtu.be/Mza4o8VOj9M>



Insert take-down lever from both sides to ensure it rotates freely when finally installed. Remove after.



Fit the and install retention pin for the take-down lever. Install the retention pin with the spring behind it.

The hole may require filing for smooth operation.

****If you have a 90-2, 92a1 or 96a1 see the section below regarding your retention pin install.****



Install take-down lever by tilting it up to fit under the retention pin. Once installed turn it to point downward.



Assemble barrel, slide and recoil spring and install onto frame

Lock the take-down lever by rotating upwards.

Rack slide to ensure smooth operation.
Under normal circumstance the two shouldn't seize onto the frame.

Remove the slide assembly from the frame for now.



Install the hammer strut into the frame from the top.

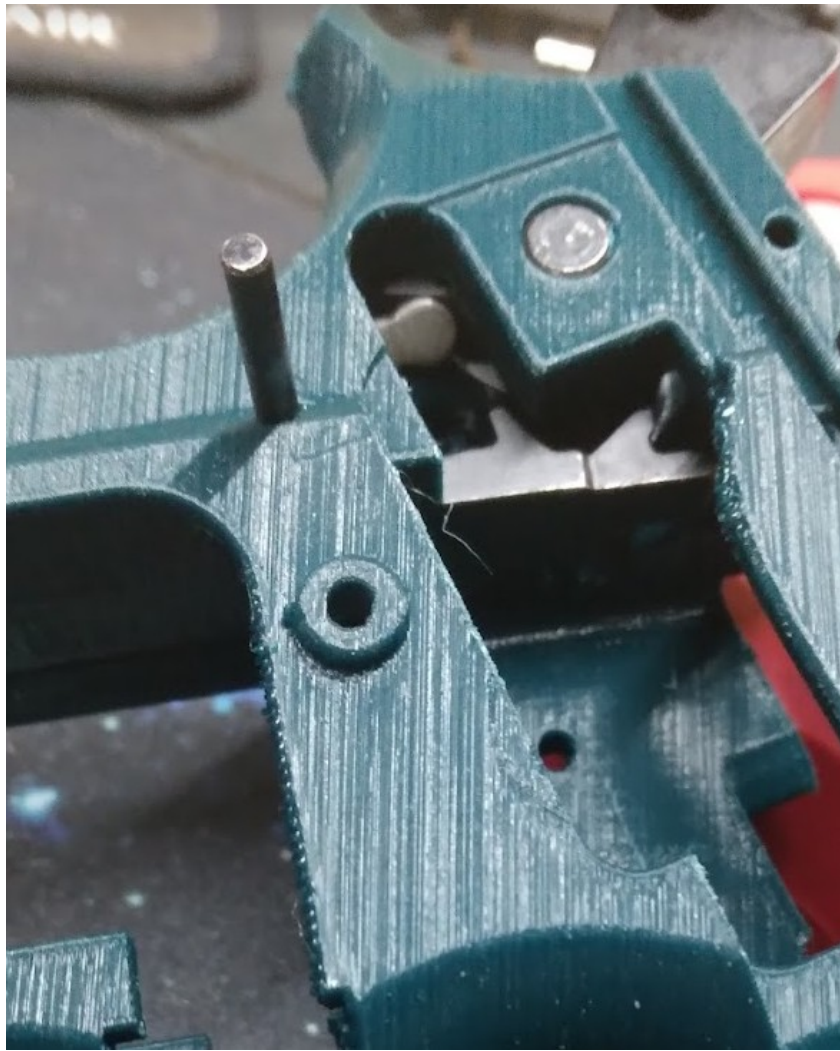


Insert the hammer / hammer pin into the frame with the strut under it.

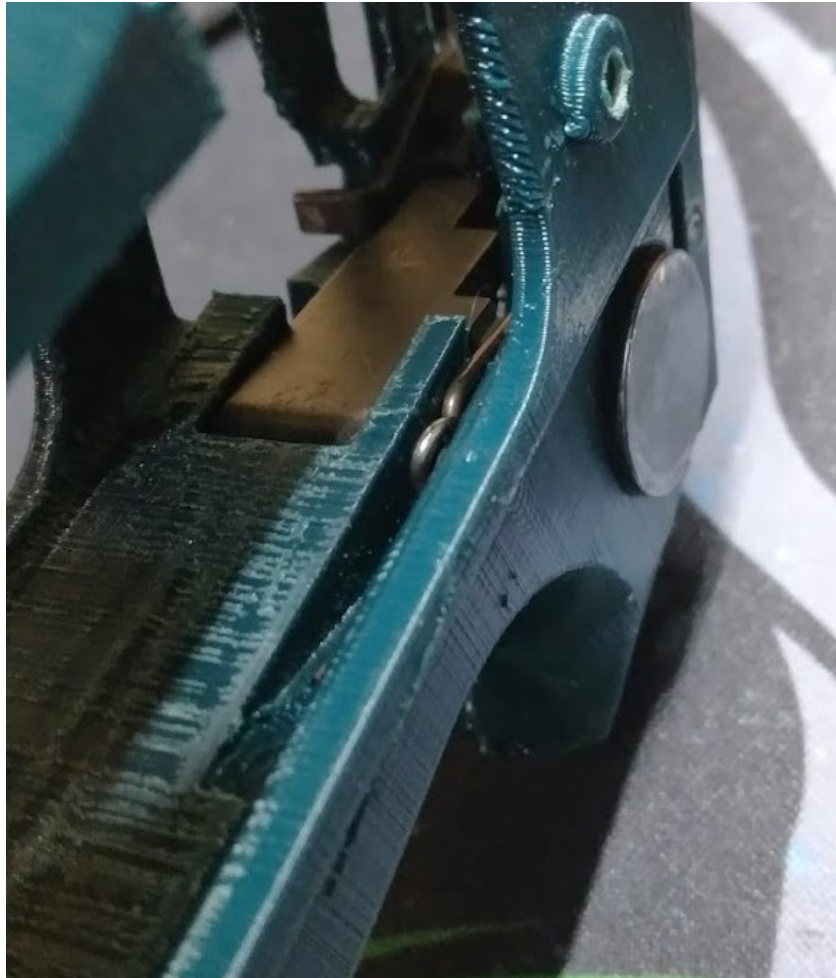
The hammer strut will sit loosely in the frame until the spring and main spring cap are installed later



Install sear into the slot under/infront the hammer from the magwell.



Install sear pin from the right hand side until it holds the sear but not completely through.



Install sear spring from the magwell (videos will help) and retain with a slave pin from the right while compressing.

Once the slave is holding the spring, use the sear pin to push the slave out retaining the spring on the pin.



Install hammer spring and hammer spring cap to underside of frame

Use a slave pin to catch the cap while compressing the spring. Make sure the hammer is dropped to relieve pressure. Drive slave pin out with the normal pin.

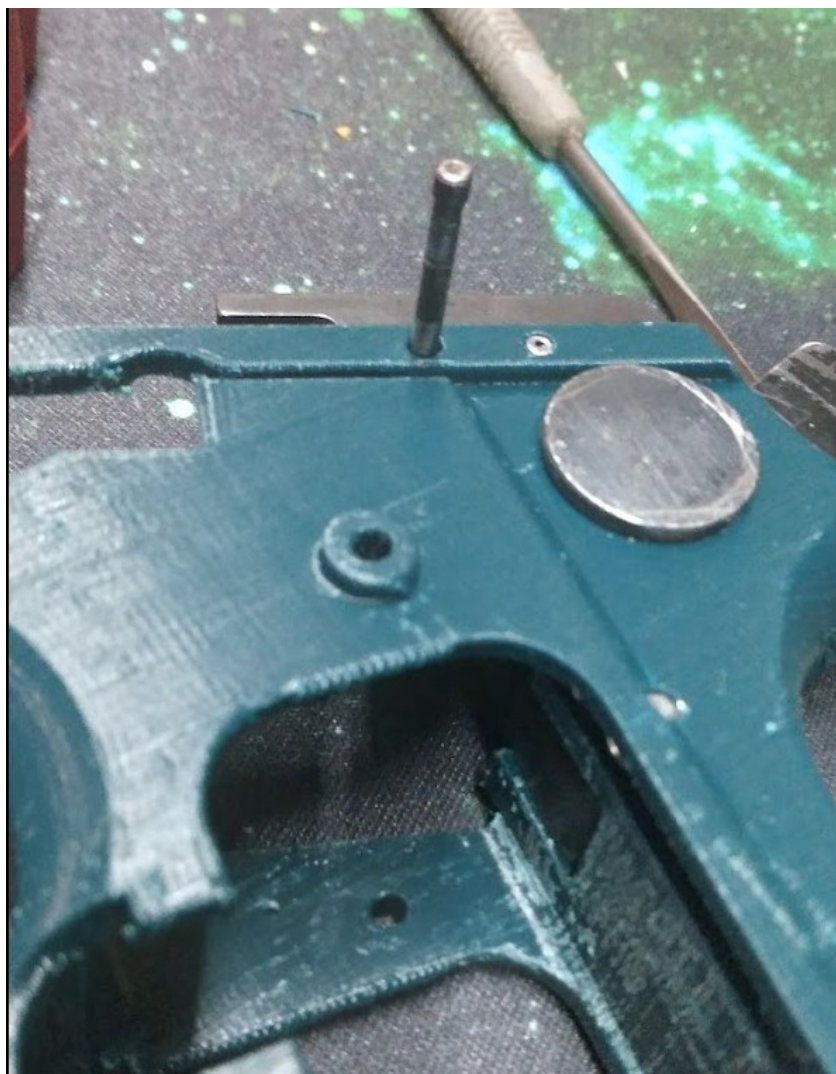
There is a 'dogbone' solid pin version and a roll pin version. Install can be difficult with the roll pin, putting a chamfer on the cap holes and the end of the roll pin can help.





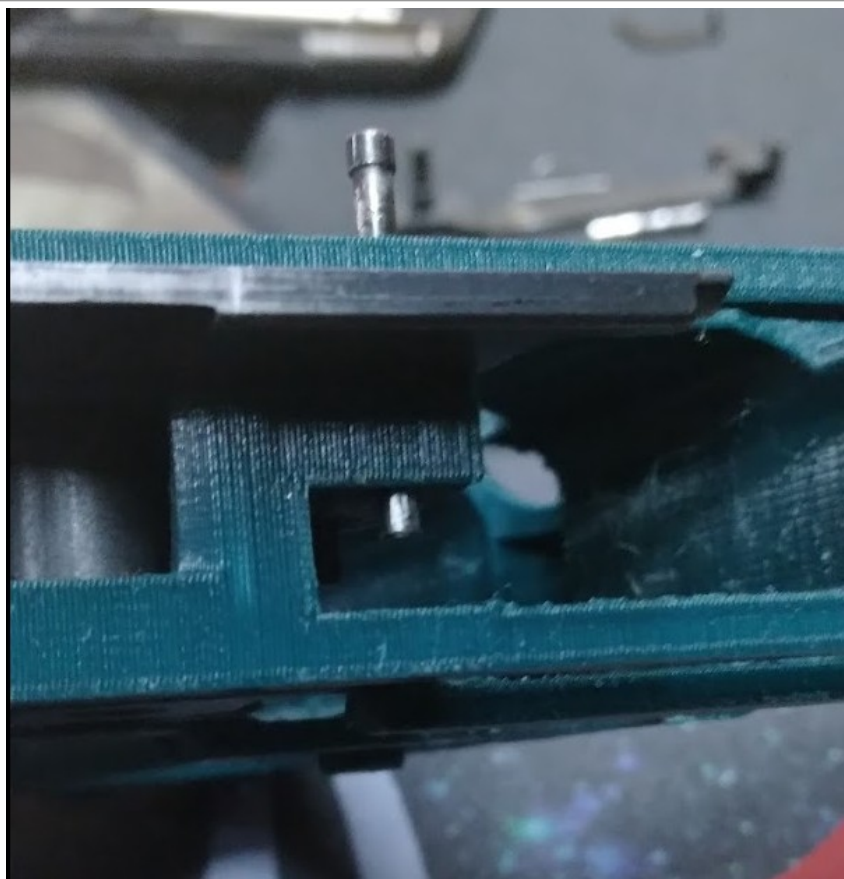
Install the ejector from the top of the frame lining up the two pin holes

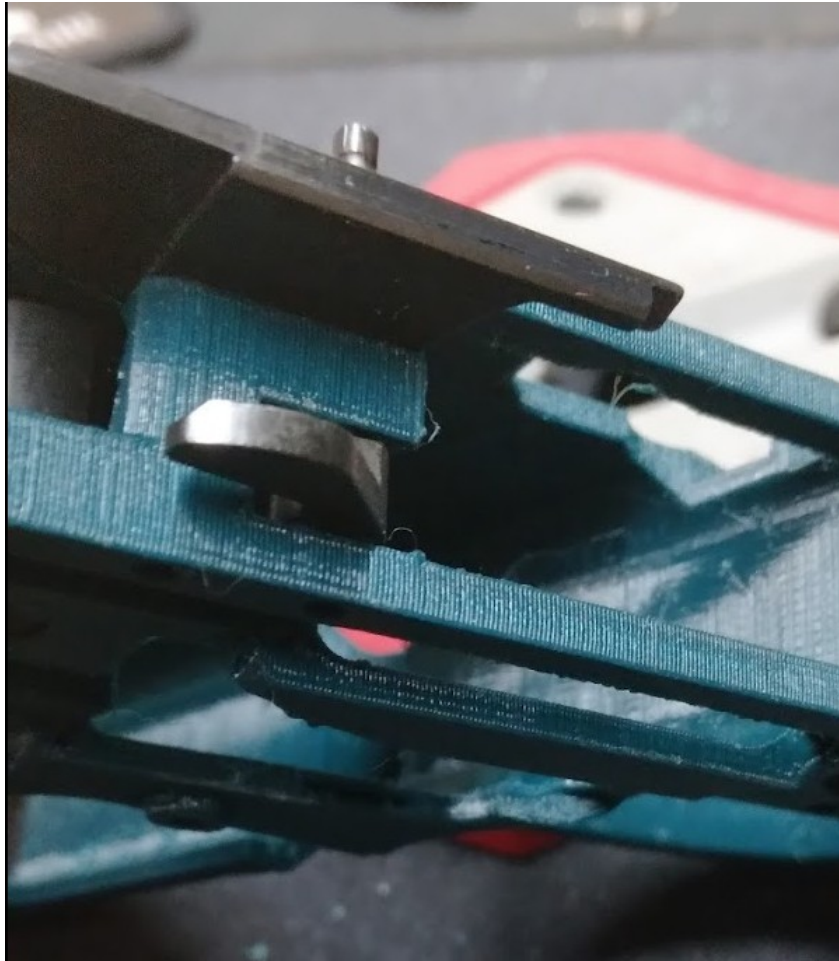
Install the roll pin into the rear hole fully.



Install the headed solid pin into the front hole from the left. The pin should just barely poke out from the other side, The decocker and trigger safety are installed onto this pin in the next steps.

The head of the pin should be on the left hand side.





Install the decocker onto the pin in the middle of the frame, pushing the headed pin to retain it and push it through the trigger safety lever.



Install the trigger safety onto the same pin and drive the pin home



Install the trigger from the bottom or from the top of the frame.

If you have 3mm pin stock cut a small piece to retain the trigger spring prior to installing it into the frame. Otherwise you will need to drop it into the trigger and drive the pin while pressing it down.



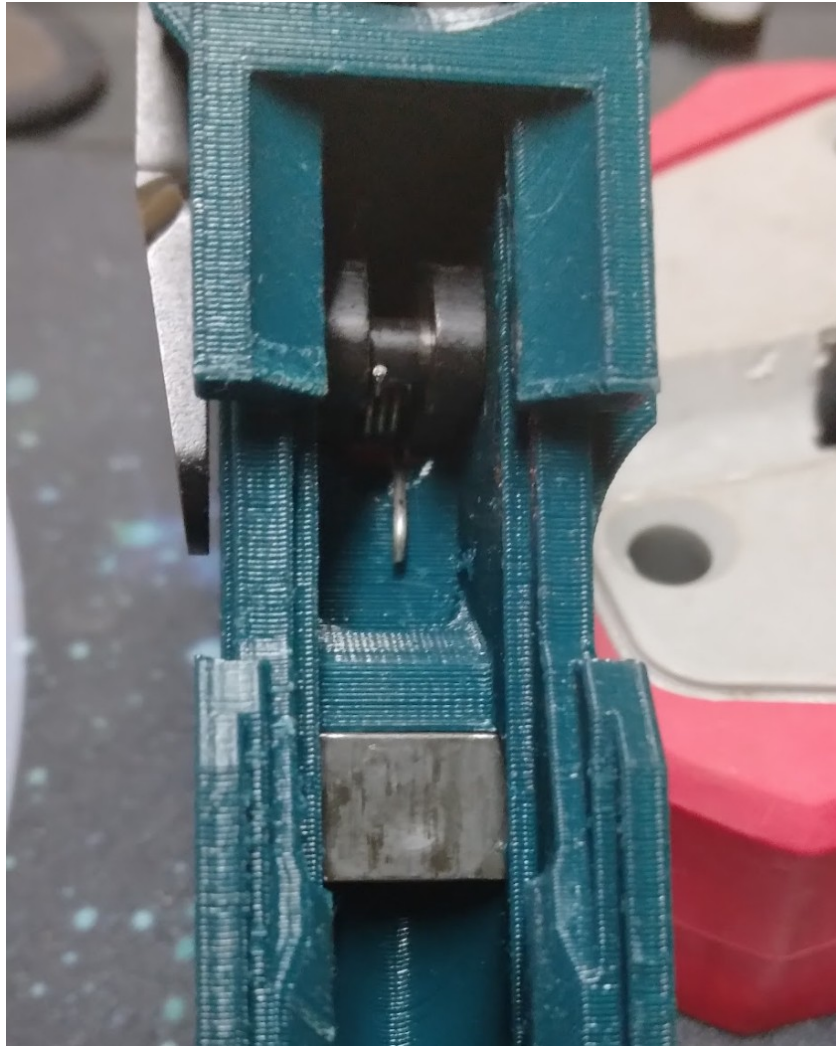
Push a slave pin from the right through the trigger to capture the trigger spring on this pin. If your spring has a long/flat leg install that forward.



Install the trigger pin from the left hand side pushing out the slave.



Insert the trigger bar into the gun at the rear and line up the front pin with the top hole in the trigger.



Use a tool to pull back the trigger spring while pushing the trigger bar through the trigger so the spring catches the trigger bar's pin.



Insert trigger bar spring under the bar to push it up. There is a hole for the leg of the spring for retention. The loop(s) sit in a notch in the frame.



Install mag catch from side you want to use it from. Watch a video on this. The voodoo magic cannot be explained.

You may find using a screwdriver from the non button side to push the springed bits of the mag catch works. Apply forward pressure at the same time.



Install slide catch spring onto the slide catch, and fit into the hole in the frame. The spring leg needs its leg inserted first. The catch will then need rotated into position and pushed into its hole.

This is an example of how the spring sits into the frame without the catch installed.



This is how the spring hooks onto the catch.



Screw your grip screws into the frame to force thread the holes. You can tap these instead.

Install grips and grip screws.



Install slide assembly and enjoy.

FUNCTION CHECK

Verify your firearm works by evaluating each of the following functions.

BE SURE YOUR GUN IS STILL UNLOADED.

Check that your chamber is empty, and that there are no rounds in the magazine.

- Empty Magazine Slide Lock:
 - Pull the slide back.
 - It should catch on the slide stop lever on an empty magazine.
- Trigger Break:
 - With the slide in battery, pull on the trigger.
 - The hammer should release.
- Trigger Reset:
 - With the slide in battery, and the trigger already fired, hold the trigger down, and rack the slide. Gently release the trigger.
 - The trigger should have a tactile or audible reset.

When you have completed the function check, the assembly process is complete.

Be sure to remove your magazine and store your firearm in a secure and safe place.

SECTION VI: EXTRA INSTRUCTIONS

90-2 AND 92A1 SPECIFIC INSTRUCTIONS:

The take-down lever, take-down retention pin are wider than normal frames on the 90-2, 92a1, and 96a1. The 90-2 has a different mainspring cap, and pin. These parts can be swapped with 92fs style parts and a 92fs style frame can be printed if you prefer.

The take-down retention pin is also different on the these three models. In my design frames have an extra hole above the take down retention pin under the barrel. Install the spring into the hole by compressing, and fitting into the hole from above. This is slightly tricky, but can be wiggled in coil by coil. The retention pin then installed from the right. It is keyed and will need twisted to be installed, and twisted again to be retained in the hole.

The 90-2 has some other stylized parts that can cause fitment issues when swapped around. I.e. the slide catch doesn't work with OE grips, but printed grips can be fitted to it.

The 90-2 also uses a different main spring cap and pin that is not round. Be cautious to chose the correct frame when printing.

The 90-2 and 92a1 style frames can fit both types of triggerbar springs as these pistols had a slightly modified spring from the FS series pistols.

92 COMPACT AND CENTURION SPECIFIC ITEMS:

There are "upper compacts" and "lower compacts" in the 92 series. A Centurion is a short slide with a full size lower. Whereas a 92 Compact is

a short lower and slide. The compact sized slides and lowers are compatible in the full-size Sphynx frames. The main difference is the main spring cap length. The compact lowers use a short cap whereas the full-size use a tall cap.

If you have a compact lower parts kit, you have three options.

1. Print a compact frame
2. Print a full size frame and use the higher pin hole
3. Print a full size frame and replace the spring cap with a full size one

92 TYPE M ASSEMBLY

Below is a video talking about the Type M single stack version of the 92 series. Due to its rarity a full assembly guide isn't written out here. The major differences are the mag catch and sear pin. The sear pin installs from the left hand side, has a head like the trigger pin, and captures the sear spring. The mag catch is nearly identical to the 85 series where its inserted from the left onto its pin and spring, then pinned in place in the trigger guard.

<https://youtu.be/ZzdvWmCnCMQ>

SECTION VII: TROUBLESHOOTING

You may encounter certain problems with your firearm either during usage or assembly.

- Slide / barrel seize to frame
 - Be sure that the barrel and slide fit in their rails independently.
 - Confirm filament isn't drooping on the rails

- File trouble spots down and reassess
 - Test the accuracy or support tuning of your printer
- Slide won't hold open when the magazine is empty
 - Make sure the slide catch works when racking manually
 - Don't limp wrist (seriously)
 - Replace your magazine springs with 5%+ springs
 - Beretta changed to stronger springs in their later magazines for the same reason.