PRM-9
Assembly Guide

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SECTION I: INTRODUCTION

The MONTGO-9 looked like a cool upper receiver- though I thought it deserved justice with its own lower receiver rather than looking out of place on a regular AR-15 lower receiver (a la the hump in the back). A bespoke lower receiver would compliment the clean, square, and slick share of the upper well, so that was what I sought out to do.

Initially, I had planned for the lower to use an ACR stock/brace interface, but unfortunately, it would look out of place due to the height/geometry of the AR-15's rear. The standard picatinny rail is still plenty and flexible enough for various accessories though.

The PRM-9 (Printed Receiver for the MONTGO-9) is principally based off an experiment I did for the Perun X-16, which is based off the lower receiver from AR-15 Technical Data Package (from The Gatalog / Deterrence Dispensed). It draws geometry from RK Spookware's UBAR-9 for the proofed magazine placement and pedigree. KM3D's upper-receiver solid model was used to help sculpt the lower receiver. While no geometry was used or referenced from Hoffman Tactical, I do want to recognize him for the idea of a reinforced separate printed takedown geometry, in addition to using a threaded insert for the grip screw and rotating the rear takedown against the pistol grip.

(You may find links to all these files in the included README.md under the "Pedigree" section.)

Thank you to Matador Arms also for providing me with a discount for the MONTGO-9 to aid development.

Vinh Nguyen

SECTION II: TOOLS AND SHOPPING LIST

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

- Gunsmithing Punch Set
- Metric Drill Bit Set
    - 2.5mm Drill Bit
    - 3.5mm Drill Bit
    - 4.0mm Drill Bit
    - 6.5mm Drill Bit
- Large Stick File
- Narrow, but not needle nose, pliers

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

- Flathead screwdriver

You can check out a recommended shopping list of tools Vinh keeps at his desk at www.vinhstoolbox.com.

SECTION III: PARTS KIT CHECKLIST

In order to successfully build your PRM-9…

UPPER PARTS

A complete slide parts kit, or a complete slide assembly should compose of the following:

- MONTGO-9 Upper Receiver from Matador Arms
- *(optional)* 1.5x28" Thread Protector or Muzzle Device

LOWER PARTS

A complete lower parts kit should compose of the following:

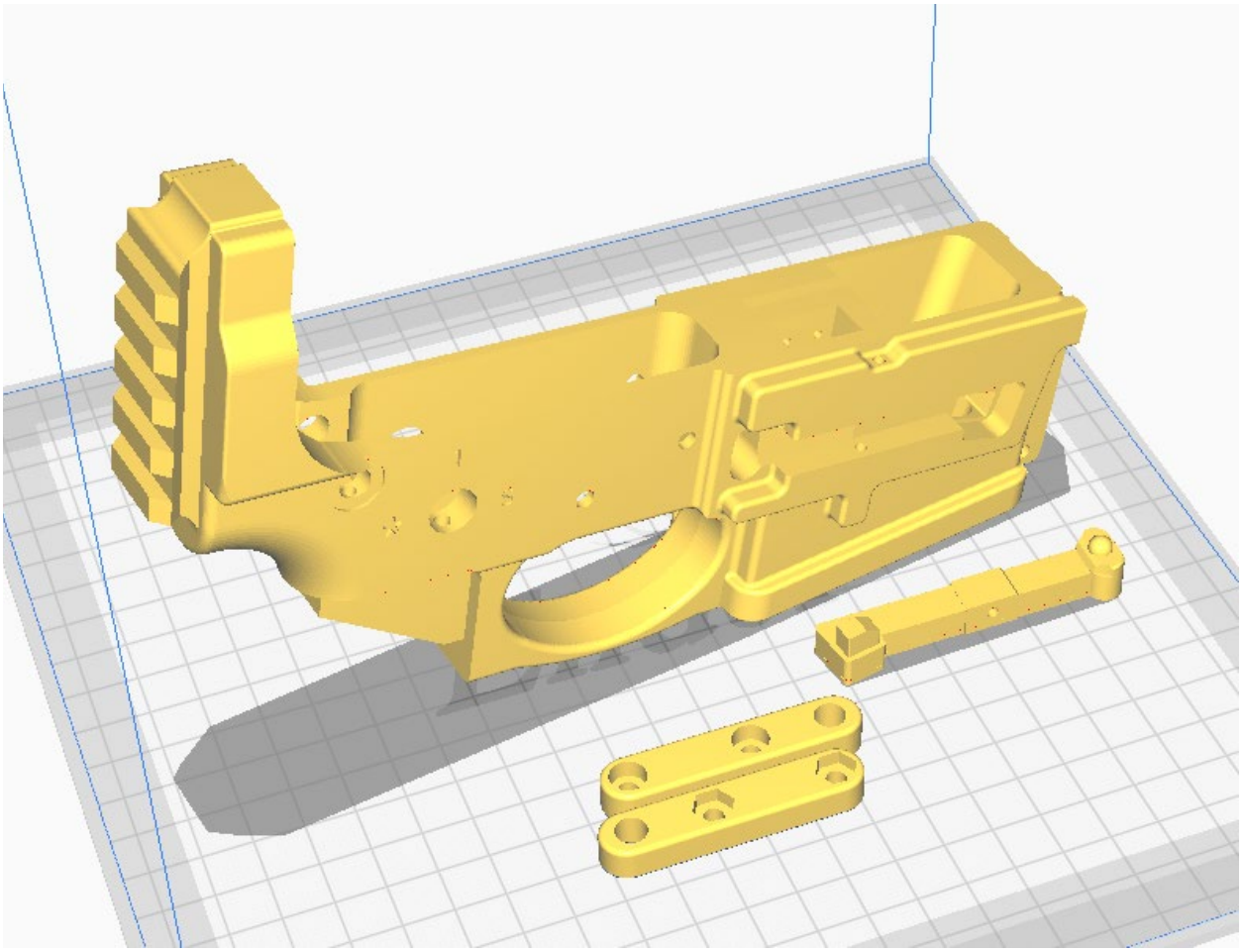
- AR-15 Lower Parts Kit, including:
  - Trigger Bow
  - Trigger Bow Spring
  - Hammer
  - Hammer Spring
  - Fire Selector
  - Fire Selector Detent
  - Fire Selector Detent Spring
  - 2x Takedown Detent
  - 2x Takedown Detent Spring
  - AR-15-compatible grip of your choosing
- RKSpookware's UBAR-9 Parts Kit, but only including:
  - 2x M3x20 Socket Head Screw (MCC 91290A123)
  - 1x M3x30 Socket Head Screw (MCC 91290A171)
  - 2x M3 Steel Hex Nut (MCC 90592A085)
  - 1x UBAR-9 Ejector
- Standard Hardware, including:
  - 2x M4 Steel Hex Nut (MCC 90592A090)
  - 2x M4x30 Socket Head Screw (MCC 91290A176)
    OR 2x M4x22 Socket Head Screw (MCC 91290A168)
    - You may find that the M4x30 socket head screws are more easily found, but will require you to trim if you want it to be flush with the lower. Trimming is not covered in this guide.

MAGAZINES AND ACCESSORIES

Don't forget you will also need:

- Magazine
    - *Glock OEM magazines work best*

PRINT SETTINGS AND ORIENTATION



Print using the above orientation. Use Cura's "Align Face to Build Plate" tool under "Rotate" to orient the lower receiver with the magwell facing downwards onto the build plate.

These were the printing settings used:

- Nozzle Size: 0.4mm
- Layer Height
  - Height: 0.16mm
  - Initial Height: 0.16mm
- Walls: 8
- Infill Density: 100%
- Supports: Tree Supports
- Bed Adhesion: Brim

eSUN PLA+ or PolyMaker PolyMax PLA+ is recommended.

SECTION IV: 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.

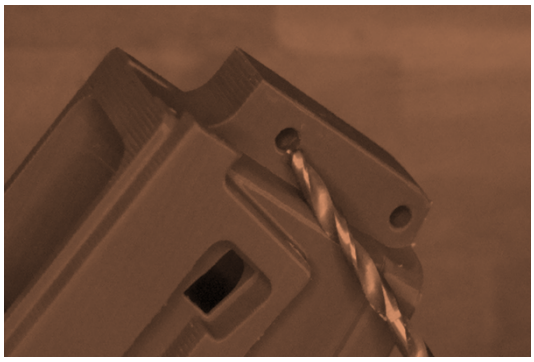
As a general reminder, here are some rules to keep in mind:

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 judgement.** If something doesn't add up- use common sense. Stop, inspect, and re-evaluate your previous actions and procedures.

PREPERATION



STOP! Remove all supports and artifacts before proceeding!

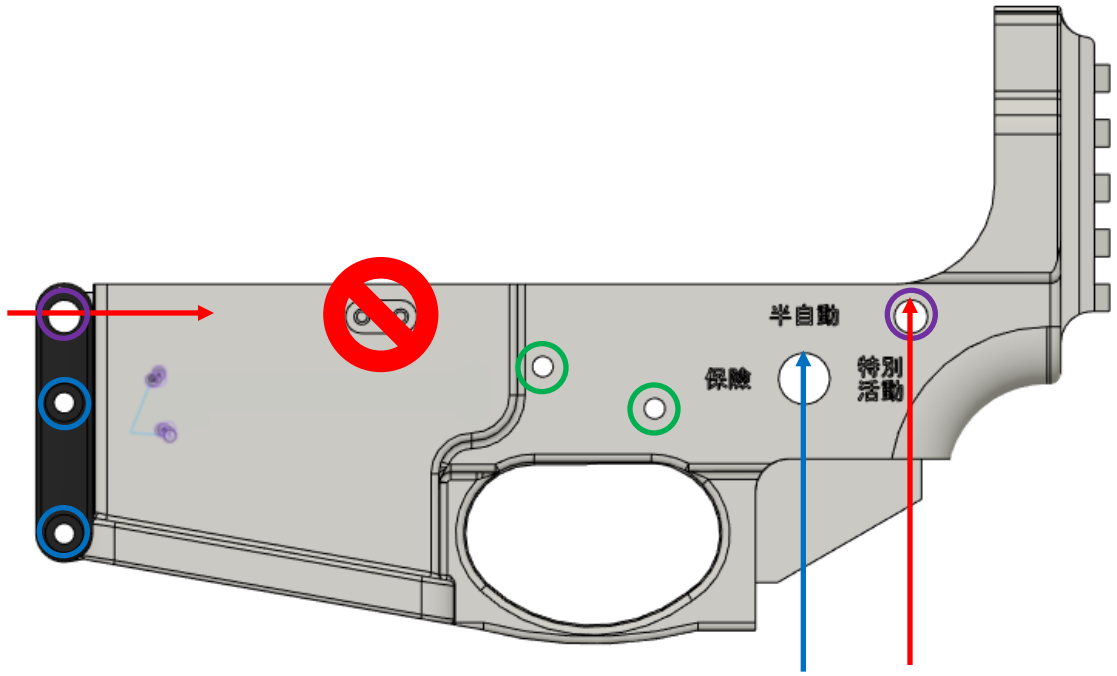
Follow the Drill Bit Chasing Guide section on the next page.

This will help ensure your model doesn't split at the layer lines around the holes.

Using a 4.0mm drill bit, chase out the takedown standoff's M4 screw holes.

Using a 6.5mm drill bit, chase out the takedown standoff's takedown hole.

DRILL BIT CHASING GUIDE



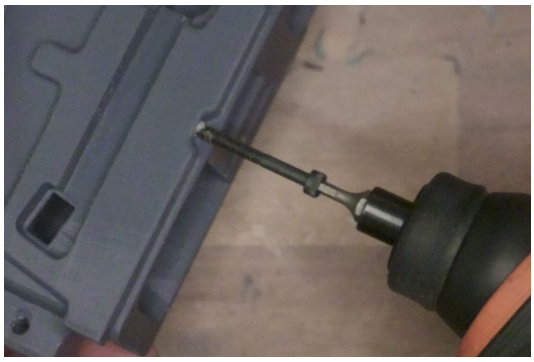
Use a drill bit to deburr and chase out the highligted holes above.

- RED - 2.5mm Drill Bit
  - 2x Takedown Pin Channels
- GREEN - 3.5mm Drill Bit
  - **CHASE THIS BY HAND.**
  - 4x Fire Control Pin Holes
- BLUE - 4.0mm Drill Bit
  - 4x Printed Takedown Support Holes (Takedown)
  - 2x Printed Takedown Support Holes (Lower)
  - 1x Fire Selector Detent Channel
- PURPLE - 6.5mm Drill Bit
  - 4x Takedown Pin Holes

TIPS:

- Use a power drill at low speed.
- Be gentle and work slowly to ensure the holes are clean and rounded.
- Insert the bit straight in- don't cant the bit or enter at an angle.
- **DO NOT** drill out the ejector retention geometry.

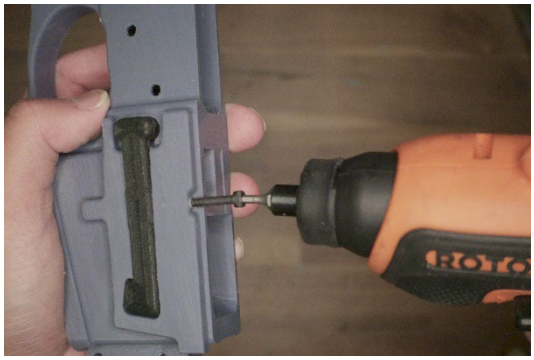
MAGAZINE RELEASE INSTALLATION (UBAR-9)



Insert the M3x30mm socket head screw and thread it partially into the magazine release geometry.

Insert the magazine release and magazine release spring.

You'll have to hold the magazine release in place while you thread in the M3x30mm. Prepare your thumb!



Thread the M3x30mm socket head completely, until the socket head is flush with the top of the receiver.

TAKEDOWN STANDOFF INSTALLATION

STOP! Did you drill and chase the channel according to the drill bit chasing guide earlier?

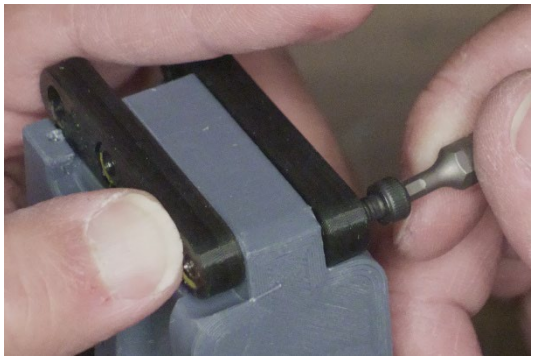
You must do this, or the detent and spring will not move freely.

Prepare the takedown stand-offs.

For the right-hand standoff, insert the two M4 nuts.

For the left-hand standoff, insert the two M4x20mm/30mm screws.

Hold the right standoff as shown against the receiver.



Hold the left standoff as shown against the receiver, and screw in the bottom M4x20mm/30mm into the nut.

Do not torque down the nut. You will need the right standoff to pivot to make installing the takedown easy.

Insert the takedown spring and detent into the channel. Insert the takedown into the standoff, then pivot the standoff onto the detent.

DO NOT LET GO. Immediately proceed to the next step.

Screw in the remaining M4x20mm/30mm screw, while holding down *both* standoffs.

Finish by torquing down the M4's.

BASIC AR-15 ASSEMBLY

These steps will walk you through the basic AR-15 lower receiver part installation, but with detail given only to the PRM-9 specific parts and instructions, as AR-15 lower assembly is considered common knowledge.

Prepare the AR-15 trigger. Insert this into the fire control pocket.

Hold down the disconnector to align the hole with the trigger bow to the receiver, then drive a fire control pin through.

Likewise, do the same for the hammer. Reset the hammer after you insert the pin completely.

Insert the fire-selector.

Insert the fire-selector detent.

Be sure it moves freely, without binding in the channel.

Insert the rear takedown detent and spring into the channel, with the rear takedown partially inside the lower.

Be sure it moves freely, without binding in the channel, too.

Place the fire-control detent spring into the grip and prepare to put attach it to the lower as shown.

Be sure it moves freely, without binding in the channel.

Ensure that the rear takedown spring and the fire-selector detent spring does not kink as you attach the grip.

Screw in the grip to the receiver.

Be sure you do NOT overtighten the screw, or it will strip the lower receiver.

The screw should self-tap into the lower.

EJECTOR ASSEMBLY (UBAR-9)

The ejector can be fickle to install, as you will have to hold the M3 nut in place. Be patient and move deliberately.

Thread in the M3 socket head screws, but only enough to keep them in place.

Insert the ejector, lining up the holes with the screws, then thread through the ejector.

Be sure to remove the tapped out filament, preferably with a craft blade.

Suspend the M3 nuts, and thread the screw further until it captures the M3 nut. Repeat this for the other screw.

Torque down the M3 socket heads, ensuring the M3 nut is tight against the receiver internally.

SECTION V: 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.

- Magazine Release Function
  - Insert and remove the magazine.
  - Test the magazine release for fluid movement.
- Fire Control Function
  - **DO NOT LET THE HAMMER FALL FREELY ONTO THE LOWER.**
  - The hammer should fall when the trigger is pulled.
  - The hammer should be held back when it its reset while the trigger is held down.

    - Release the trigger while the hammer is in the disconnected position should gently put the hammer back into the cocked state.
    - The safety should freely rotate between SAFE and FIRE.
    - When the safety is in SAFE, the hammer should not drop when the trigger is pulled.
- Takedown Function
    - The takedown should be able to move freely, with or without stiffness.

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: TROUBLESHOOTING

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

- Grip screw geometry stripped
    - Do not over tighten the grip screw. You can still salvage this if you melt some loose filament against the wall of the grip screw channel.