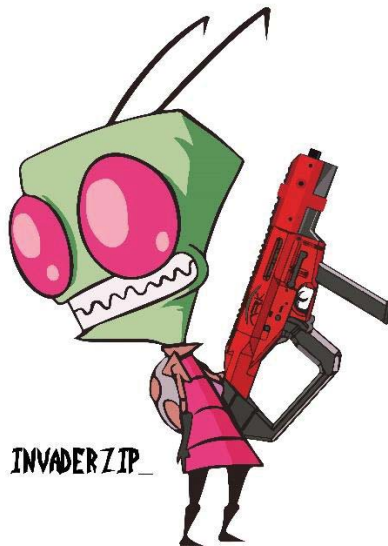
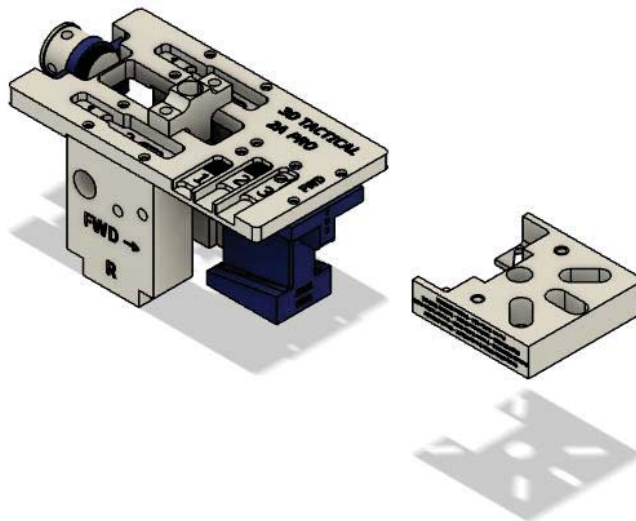
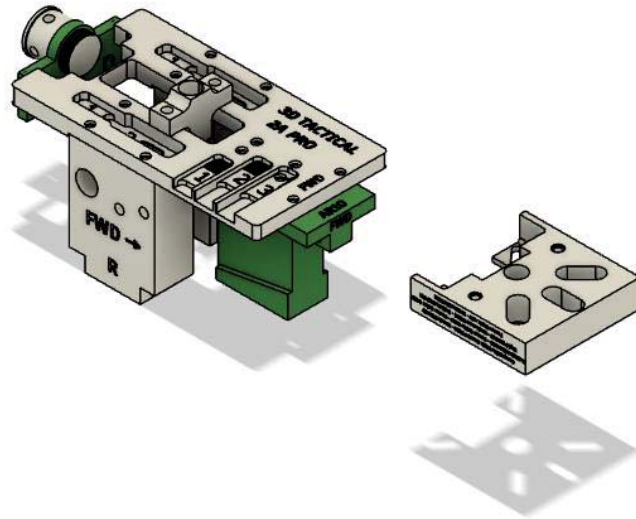




&



3D TACTICAL 2A PRO



Designer: **InvaderZip_**

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OVERVIEW

The 3D Tactical 2A Pro (3DT2A) has the benefit of reusability. When parts begin to wear, they can be reprinted, replaced, and reused at a modular level. The structure was designed to create ultimate support for the receiver during the milling process to counteract adverse effects of unstable jigs. Lower receivers are secured at 4 main locations: The front pivot pin, the rear buffer tower dowel, the underside of the rear fire control group pocket, and the magazine well. 3DT2A PRO utilizes heat-press threaded inserts to ensure rigidity throughout. Additionally, you will find that press-fit steel drill guides are employed to guarantee the prevention of elongated holes in both the receiver, and the jig guides. Finally, a high-speed bearing is used to provide additional support and prevent 'chatter' of the end mill. There are a total of 12 parts that you will be required to print, totaling an average of 1.5 kilograms of filament. You may print with your personal preference of material. PLA is acceptable.

Note: This jig is not compatible with Cerro Forge Ruger SR-762 Style 80% lower receivers.

PRINTER & CALIBRATION

If you do not already own a 3D printer, the [Ender 3](#), [Ender 3 Pro](#), [Ender 3 V2](#), and [Ender 3 Max](#) are all highly recommended. These printers provide the highest quality, build volume, and ease of printing for the price, in comparison to other companies (Prusa). Watch this [video](#) to guide you through assembling your first printer.

If you have already calibrated your printer, you can [skip this section](#).

Printer calibration is a key aspect of using a 3D printer. Typically, your printer is not going to perform to specifications immediately after assembly. Fine tuning your settings prior to printing can spare you a lot of time. Ensure your printer's bed is leveled properly. This can be achieved with test prints, hardware such as the [BLTouch](#), or any preferred method that yields level results. If your bed is not properly leveled, your print will fail. Watch this [guide](#) on how to level your bed.

There are two keys to calibration: Flow and Dimensions. *Flow* is more detail-oriented and should be calibrated before *Dimensional* tuning. Watch this [guide](#) on how to accomplish this.

Beyond this point your printer is assumed to be calibrated.

SLICER SETTINGS — CURA

If you have not done so already, please download [CURA](#) and watch this [video](#).

Select the Standard Profile. These settings are *recommended* for all prints.

Adjust your settings at your own risk.

All other settings not listed may be left at default.

Filament Type	Any (Standard PLA used for all testing)
Filament Diameter	1.75mm (Standard)
Nozzle Diameter	0.4mm (Standard)
Layer Height	0.2mm (Standard)
Top/Bottom Layers	4
Wall Line Count	4
Infill Pattern	Octet
Infill Percent	Any (Superseded by 999 Wall Line Count)
Supports	Tree
Support Angle	45°
Bed Temperature	60° C (Dependent on Filament)
Nozzle Temperature	200° C (Dependent on Filament)
Wall Speed	Default
Infill Speed	Default

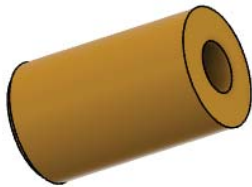
MATERIALS LIST

The benefit of this jig's design is to allow replacement of parts as needed.

- ❖ Press-Fit Drill Bushing - $\frac{5}{32}$ " Inside Diameter X $\frac{5}{16}$ " Outside Diameter, 1- $\frac{3}{8}$ " Overall Length
 - QTY: 4 (Trigger/Hammer Pins)



- ❖ Press-Fit Drill Bushing - $\frac{3}{8}$ " Inside Diameter X $\frac{3}{4}$ " Outside Diameter, 1- $\frac{3}{8}$ " Overall Length
 - QTY: 2 (Safety Selector)



- ❖ Press-Fit Drill Bushing - $\frac{21}{64}$ " Inside Diameter, X $\frac{5}{8}$ " Outside Diameter, 1- $\frac{3}{8}$ " Overall Length
 - QTY: 1 (Pilot Guide)



MATERIALS LIST – CONTINUED

- ❖ Ball Lock Hitch Pin - $\frac{1}{4}$ " Outside Diameter, $1\frac{1}{4}$ " Useable Length, $1\frac{1}{2}$ " Overall Length
 - QTY: 1 (FWD Pivot Pin - Small Frame)



- ❖ Ball Lock Hitch Pin - $\frac{9}{32}$ " Outside Diameter, $2\frac{1}{4}$ " Useable Length, 3" Overall Length
 - QTY: 1 (FWD Pivot Pin - Large Frame)



- ❖ #8-32 Low-Profile Socket Head Screws - $\frac{3}{4}$ " Long
 - QTY: 22 (All Mounting Hardware)



MATERIALS LIST – CONTINUED

- ❖ #8-32 Heat-Pressed Threaded Inserts – 0.234" Outside Diameter, 0.312" Overall Length

- QTY: 28 (All Mounting Hardware Inserts)

🔧 [Heat-Pressed Threaded Insert Strength Test Data](#)



- ❖ Aluminum Spacer – 8 mm Outside Diameter, M4 Screw Inside Diameter, 4 mm Overall Length

- QTY: 2 (#1 Guide Pins)



- ❖ Aluminum Spacer – 8 mm Outside Diameter, M4 Screw Inside Diameter, 8 mm Overall Length

- QTY: 2 (#2 Guide Pins)



MATERIALS LIST — CONTINUED

- ❖ Aluminum Spacer - 8 mm Outside Diameter, M4 Screw Inside Diameter, 13 mm Overall Length
 - QTY: 2 (#3 Guide Pins)



- ❖ #6-32 Hex Socket Button Cap Screw - 1/4" Length Under Head
 - QTY: 3 (Bearing Retainers)



- ❖ Deep Groove Radial Ball Bearing 6002Z - 15mm Inside Diameter, 32mm Outside Diameter
 - QTY: 1 (Router Plate)



MATERIALS LIST — CONTINUED

- Universal End Cap – 1-3/16" Diameter X 16 Threads Per Inch
 - QTY: 1 (Metal Buffer Tower Cap) OPTIONAL

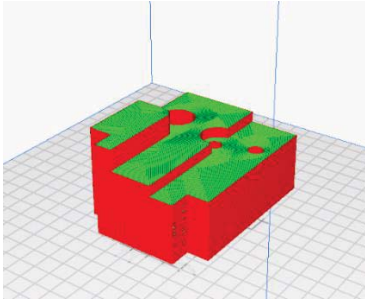


- Jobber Length Drill Bits:
 - 3/8"
 - 21/64"
 - 5/32"

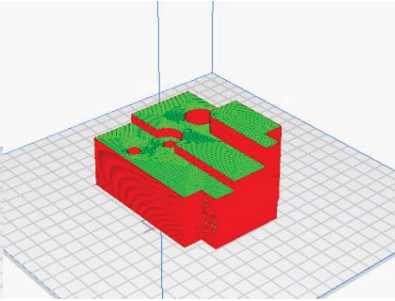


PRINT ORIENTATIONS

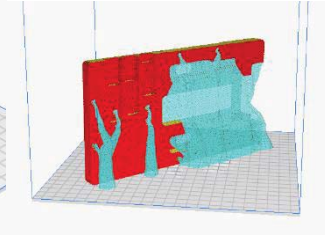
The following images depict how objects should be printed for optimum strength and lowest fail rate.



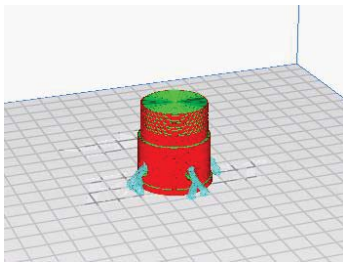
Left Block



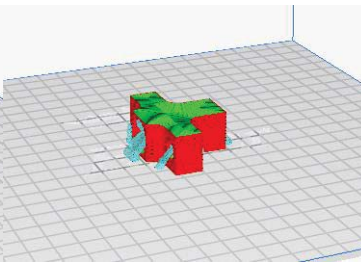
Right Block



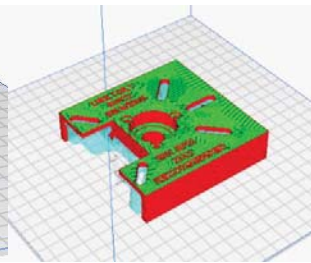
Top Plate



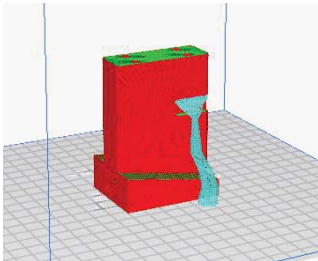
Buffer Cap



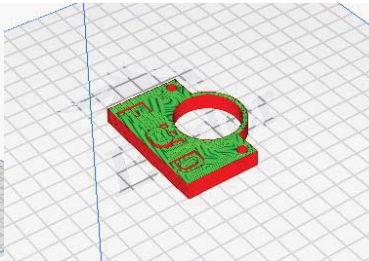
Pilot Guide



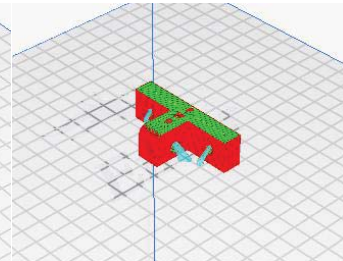
Router Plate



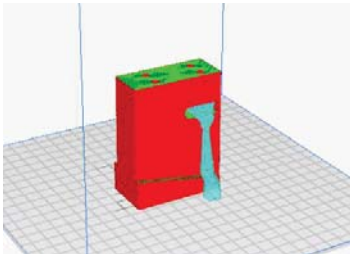
AR15 Vise Block



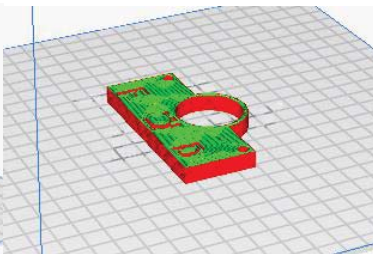
AR15 Rear Block



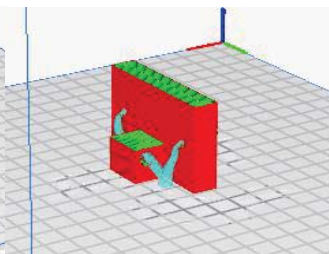
AR15 Pivot Block



AR10 Vise Block



AR10 Rear Block



AR10 Pivot Block

JIG ASSEMBLY — HARDWARE

At this point you should have 12 dense prints in front of you. This next step will require you to install (7) *Press-Fit Drill Bushings* and (28) *Heat-Pressed Threaded Inserts*.

- ✓ Place all 7 *Press-Fit Drill Bushings* into the freezer for ease of installation later.
- ✓ Acquire all 28 *Heat-Pressed Threaded Inserts*.

✚ Note: Do not attempt to install inserts without applying heat. This will cause the parts to crack, and you will need to reprint them.

- Install one bolt into each insert. Apply heat (via torch/lighter/soldering iron) to the insert for 30-45 seconds while holding the bolt head with pliers or an equivalent. The bolt will be HOT! Carefully press these inserts into the corresponding holes throughout the jig, making sure they are straight and completely flush or slightly recessed. Let all parts cool to room temperature before removing the bolts.
 - 4 holes at the top of the left block. [Refer to Figure 0-1](#)
 - 4 holes at the top of the right block. [Refer to Figure 0-2](#)
 - 4 holes at the rear of the top plate. [Refer to Figure 0-3](#)
 - 2 holes at the center of the top plate (in line with the #3 guide slotted opening). [Refer to Figure 0-4](#)
 - 4 holes at the top of the AR15 vise block. [Refer to Figure 0-5](#)
 - 2 holes at the top of the AR15 pivot block (ensure this part looks like the letter T when installing in the top). [Refer to Figure 0-6](#)
 - 4 holes at the top of the AR10 vise block. [Refer to Figure 0-7](#)
 - 2 holes at the top of the AR10 pivot block (ensure this part looks like the letter T when installing in the top). [Refer to Figure 0-8](#)
 - 2 holes at the bottom of the router plate (this is opposite of the cutout for the bearing). [Refer to Figure 0-9](#)

✚ [Heat-Pressed Threaded Insert Strength Test Data](#)

- ✓ Remove drill guides from the freezer one at a time and complete the following:
 - Note: Always install drill guides from outside to inside. You want the guides to become flush with the surface nearest to your drill.
 - Carefully tap these drill guides into the corresponding holes throughout the jig:
 - 3 holes on the side face of the left block. [Refer to Figure 0-10](#)
 - 3 holes on the side face of the right block. [Refer to Figure 0-11](#)
 - 1 hole on the top of the pilot guide. [Refer to Figure 0-12](#)

HEAT-PRESS THREADED INSERT / PRESS-FIT DRILL BUSHING FIGURES

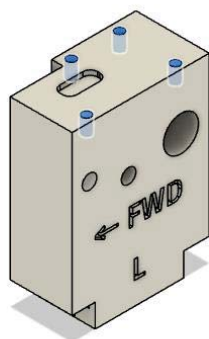


Figure 0-1

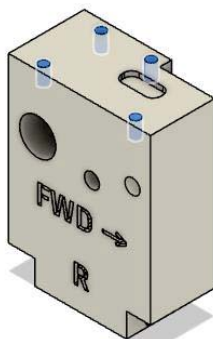


Figure 0-2

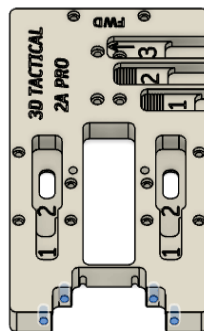


Figure 0-3

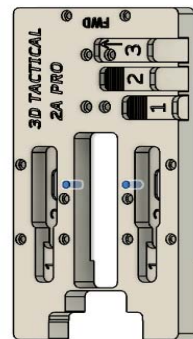


Figure 0-4

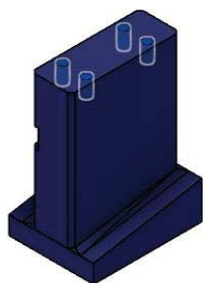


Figure 0-5

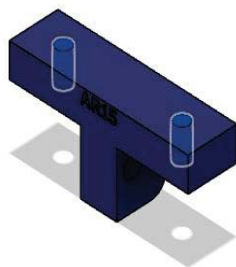


Figure 0-6

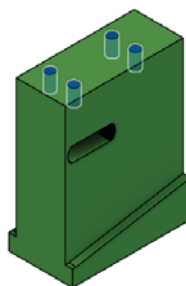


Figure 0-7

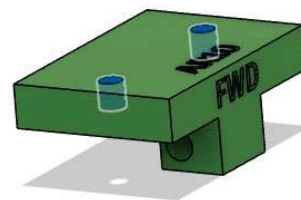


Figure 0-8

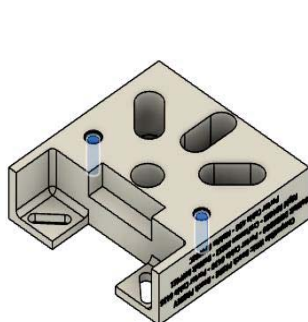


Figure 0-9

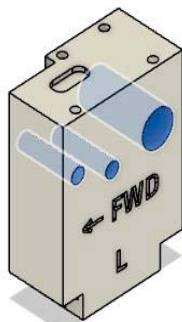


Figure 0-10

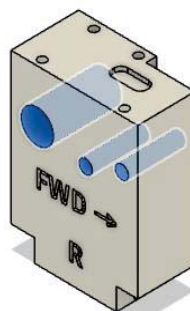


Figure 0-11

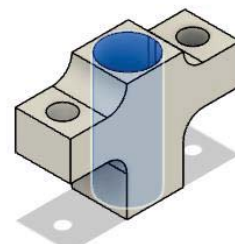


Figure 0-12

JIG ASSEMBLY — CONFIGURATION

There are 2 assembly configurations that will permit you to mill a small or large frame 80% receiver. In both configurations, the following main 6 pieces are unchanged and remain in the same orientation: Top Plate, Left & Right Block, Pilot Guide, Router Plate, and Buffer Cap.

❖ AR 9/15/45 Configuration

- Note which 3 pieces are labeled 'AR15' – you will be using these 3 to prepare to mill a small-frame receiver.
 1. Install the AR15 pivot block to the underside of the top plate and secure it with 2 *Low-Profile Socket Head Screws*. This should align with the inscribed letters 'FWD' on the top plate. Verify that the letters 'FWD' on the pivot block is facing out. [Refer to Figure 1-1.](#)
 2. Install the AR15 rear block to the back side of the receiver, making note that the oval shaped protrusion mates with the receiver's cut-out section. The letters 'FWD' should be facing in towards the magazine well. [Refer to Figure 1-2.](#)
 3. Thread the buffer cap through the rear block and into the lower receiver's buffer tower. Do not tighten completely at this time. [Refer to Figure 1-3.](#)
 4. Align the large hole on the AR15 pivot block with the 2 pivot holes on the front-end of the receiver. You will secure this with the *ball lock hitch pin*. [Refer to Figure 1-4.](#)
 5. Align the AR15 rear block holes with the corresponding holes on the top plate and secure it with 2 *Low-Profile Socket Head Screws*. You may now tighten the buffer cap. [Refer to Figure 1-5.](#)
 6. Install the left and right blocks on either side of the receiver, aligning the cut-out slotted shape with the top plate. Take note how they support the underside of the receiver near the grip's cut-out. Make sure that the letters 'FWD ->' are facing towards the AR15 pivot block. Secure each with 4 *Low-Profile Socket Head Screws*. [Refer to Figure 1-6.](#)
 7. Install the AR15 vise block inside the magazine well of the receiver. Take note of the angled profile and ensure this matches the bottom-end of the receiver. Secure this with 4 *Low-Profile Socket Head Screws*. There will be a gap between the AR15 vise block and the Top Plate, DO NOT attempt to overtighten. This is part of the design. [Refer to Figure 1-7.](#)
 8. Install the pilot guide on the center of the top plate with the longer end pointing down. Forward orientation does not matter with this piece. Secure this with 2 *Low-Profile Socket Head Screws*. [Refer to Figure 1-8.](#)

✓ [You are now ready to mill a small-frame receiver.](#)

AR 9/15/45 ASSEMBLY FIGURES

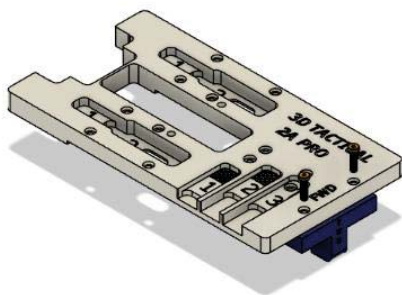


Figure 1-1

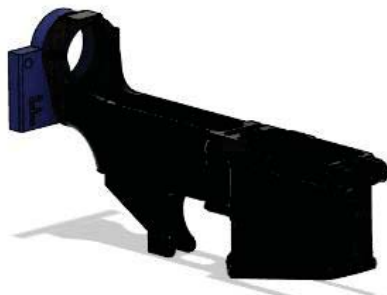


Figure 1-2



Figure 1-3

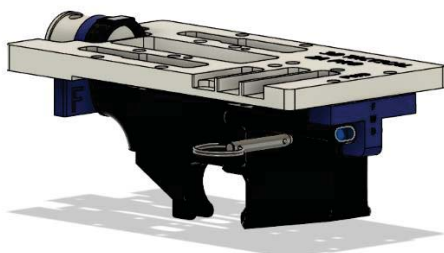


Figure 1-4

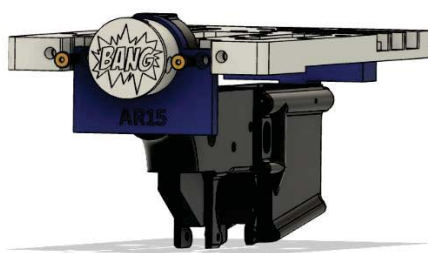


Figure 1-5

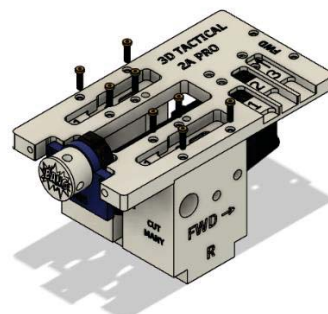


Figure 1-6

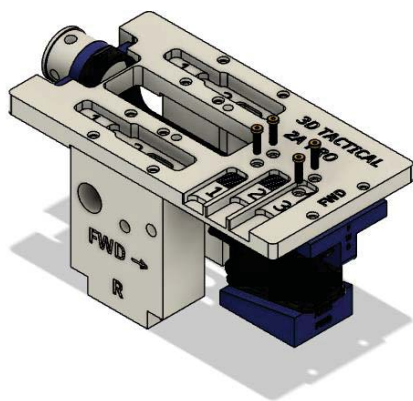


Figure 1-7

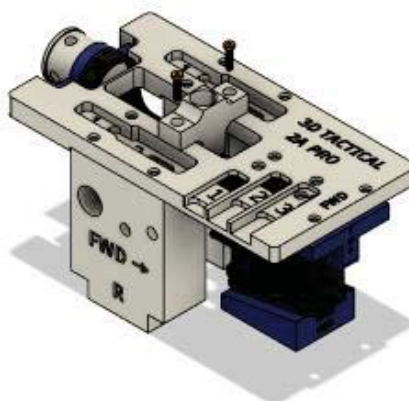


Figure 1-8

JIG ASSEMBLY — CONFIGURATION

CONTINUED

❖ AR 10/12/308 Configuration

- Note which 3 pieces are labeled 'AR10' – you will be using these 3 to prepare to mill a large-frame receiver.
 1. Install the AR10 pivot block to the underside of the top plate and secure it with 2 *Low-Profile Socket Head Screws*. This should align with the inscribed letters 'FWD' on the top plate. Verify that the letters 'FWD' on the pivot block is facing out. [Refer to Figure 2-1.](#)
 2. Install the AR10 rear block to the back side of the receiver, making note that the oval shaped protrusion mates with the receiver's cut-out section. The letters 'FWD' should be facing in towards the magazine well. [Refer to Figure 2-2.](#)
 3. Thread the buffer cap through the rear block and into the lower receiver's buffer tower. Do not tighten completely at this time. [Refer to Figure 2-3.](#)
 4. Align the large hole on the AR10 pivot block with the 2 pivot holes on the front-end of the receiver. You will secure this with the *ball lock hitch pin*. [Refer to Figure 2-4.](#)
 5. Align the AR10 rear block holes with the corresponding holes on the top plate and secure it with 2 *Low-Profile Socket Head Screws*. You may now tighten the buffer cap. [Refer to Figure 2-5.](#)
 6. Install the left and right blocks on either side of the receiver, aligning the cut-out slotted shape with the top plate. Take note how they support the underside of the receiver near the grip's cut-out. Make sure that the letters 'FWD ->' are facing towards the AR10 pivot block. Secure each with 4 *Low-Profile Socket Head Screws*. [Refer to Figure 2-6.](#)
 7. Install the AR10 vise block inside the magazine well of the receiver. Take note of the angled profile and ensure this matches the bottom-end of the receiver. Secure this with 4 *Low-Profile Socket Head Screws*. There will be a gap between the AR10 vise block and the top plate, DO NOT attempt to overtighten. This is part of the design. [Refer to Figure 2-7.](#)
 8. Install the pilot guide on the center of the top plate with the longer end pointing down. Forward orientation does not matter with this piece. Secure this with 2 *Low-Profile Socket Head Screws*. [Refer to Figure 2-8.](#)

✓ [You are now ready to mill a large-frame receiver.](#)

AR 10/12/308 ASSEMBLY FIGURES

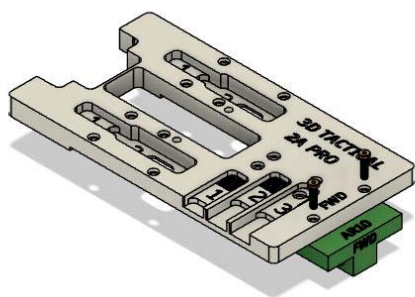


Figure 2-1

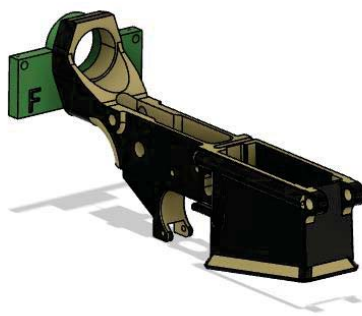


Figure 2-2

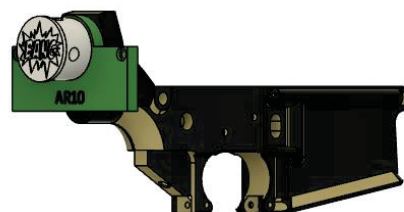


Figure 2-3

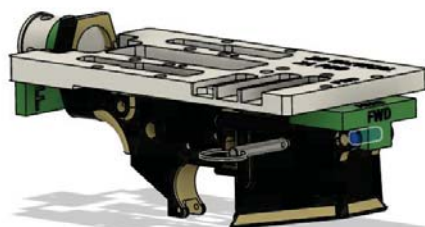


Figure 2-4



Figure 2-5

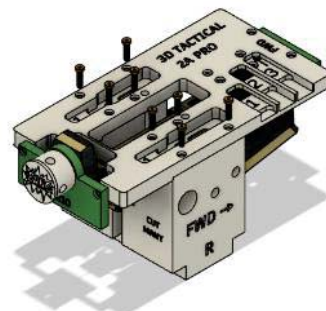


Figure 2-6

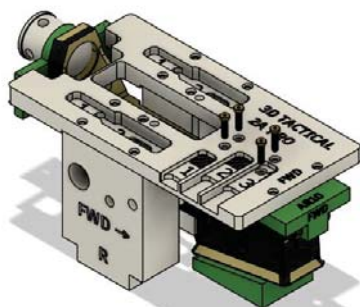


Figure 2-7

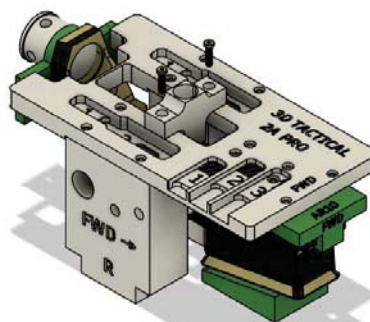


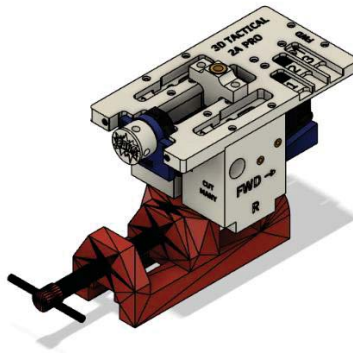
Figure 2-8

MILLING PROCEDURES

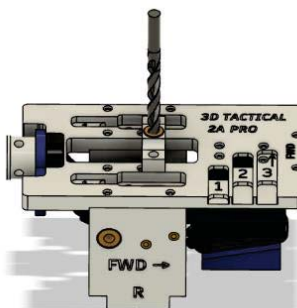
❖ GENERAL NOTES ON MILLING – READ ENTIRELY:

- The provided depth gauge hash marks denote the maximum depth of cut per pass. *Beginners and those seeking maximum finish quality should make milling passes at less than a full hash mark.* Attempting to mill at depth increments higher than recommended can cause damage to the end mill and/or receiver.
 - Ensure that your router base lock is tight and functioning properly. If the router depth moves while milling, the end mill and/or receiver *can be damaged*.
 - If using a variable speed router, set to the highest speed setting. Do not insert or remove the end mill while the router is spinning.
 - Prior to turning the router on, ensure the end mill is centered within the milling pilot hole and not contacting any part of the receiver. Hold firmly.
 - Drill Bits Used: 5/32" 21/64" 3/8" (All Jobber Length)
 - End Mill Used: 5/16" Square End Mill – 3 Flutes (Length May Vary with Router)
 - Compatible Routers: Bosch PR10E – Bosch PR20EV – DeWalt DWE6000 – Porter Cable 6430
Porter Cable 6435 – Rigid R24012 – Craftsman 28212 – DeWalt DWP611 – Porter Cable 450
Makita RT0701C
-

1. Install your 3DT2A PRO jig in a vise, taking note of the inscribed 'VISE HERE ONLY' lettering. Failure to clamp here will result in a warped or broken jig.



2. Put cutting oil into the Pilot Guide hole and insert the 21/64" drill bit. Do not start drilling until the bit is fully inserted. Using care to keep the drill bit straight and perpendicular to the receiver, begin drilling. Periodically pull the drill bit out of the Pilot Guide to clear chips. Apply lubricant liberally. Drill until the bit exits the bottom of the receiver.

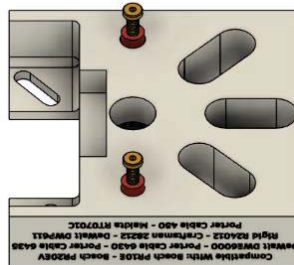


MILLING PROCEDURES — CONTINUED

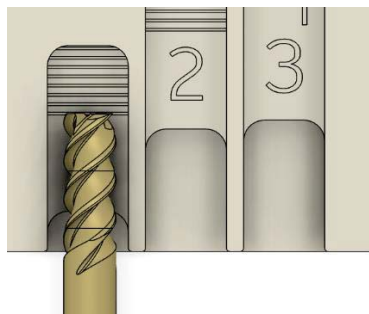
3. Remove Pilot Guide from the Top Plate and set aside.
4. Install the *Bearing* in your Router Plate and secure it with 3 *6-32 Hex Socket Button Cap Screws*. The orientation of the bearing is irrelevant. Ensure the screws are installed straight and NOT overtightened. These screws serve as a precautionary measure for bearing retention.



5. Install the router plate to your router using hardware provided by your specific router's manufacturer. Align the slotted holes with the bolt holes on your router's housing face. The bearing should not be visible once installed to your router.
6. Install 2 #1 **(Shortest)** *Aluminum Spacers* to the Router Plate using 2 *Low-Profile Socket Head Screws*. Do not overtighten. Make sure the pins are fully seated. Failure to install the SHORTEST spacers at this point could result in your receiver being inoperable.

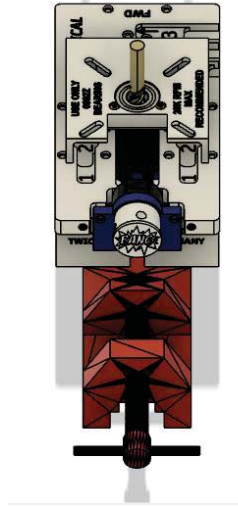


7. Set the end mill depth to the first hash mark on the Top Plate using Depth Gauge #1. Set the depth by holding the base of Router Plate against the edge of the Top Plate. Be sure the *Aluminum Spacers* are not between the Router Plate and Top Plate. Make sure router depth adjustment is locked after each depth setting.

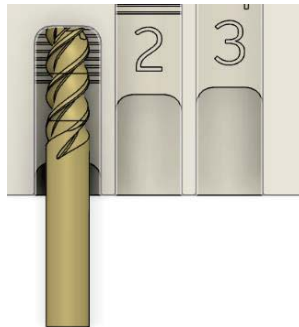


MILLING PROCEDURES — CONTINUED

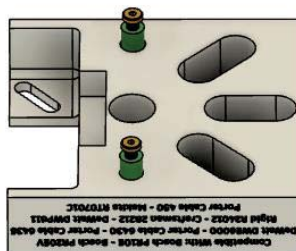
8. Orient the Jig so the Buffer Cap is closest to the user. Place the router on the Top Plate, with the end mill centered within the drilled hole in the receiver. The *Aluminum Spacers* should be positioned inside the #1 Top Plate slots on both sides. Hold firmly, turn the router on, and mill using consistent pressure and speed until all metal has been removed at this height. Do not remove router until end mill comes to a complete stop.



9. Remove end mill and set depth to the second hash mark on the Top Plate using Depth Gauge #1. Repeat these steps until you reach the end of the #1 depth gauge slot, increasing depth by *1 hash mark at a time*.

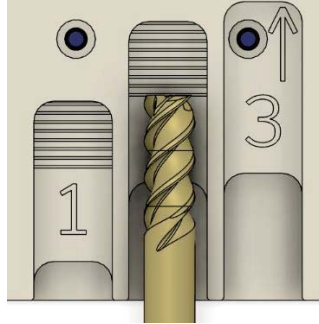


10. **STOP.** Before continuing to Depth Gauge #2, the #2 **(Medium)** *Aluminum Spacers* must be installed on the Router Plate using 2 *Low-Profile Socket Head Screws*. Do not overtighten. Make sure the pins are fully seated. Failure to change *Aluminum Spacers* will render your lower receiver inoperable.

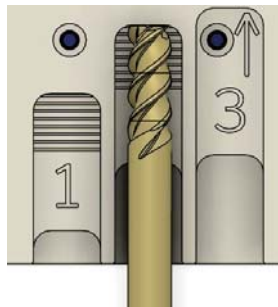


MILLING PROCEDURES — CONTINUED

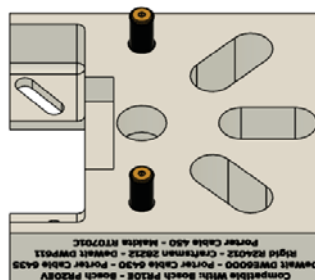
11. Set the end mill depth to the first hash mark using Depth Gauge #2. Set the depth by holding the base of Router Plate against the edge of the Top Plate. Be sure the *Aluminum Spacers* are not between the Router Plate and Top Plate. Make sure router depth adjustment is locked after each depth setting.



12. Orient the Jig so the Buffer Cap is closest to the user. Place the router on the Top Plate, with the end mill centered within the drilled hole in the receiver. The *Aluminum Spacers* should be positioned inside the #2 Top Plate slots on both sides. Hold firmly, turn the router on, and mill using consistent pressure and speed until all metal has been removed at this height. Do not remove router until end mill comes to a complete stop.
13. Remove end mill and set depth to the second hash mark on the Top Plate using Depth Gauge #2. Repeat these steps until you reach the end of the #2 depth gauge slot, increasing depth by *1 hash mark at a time*.

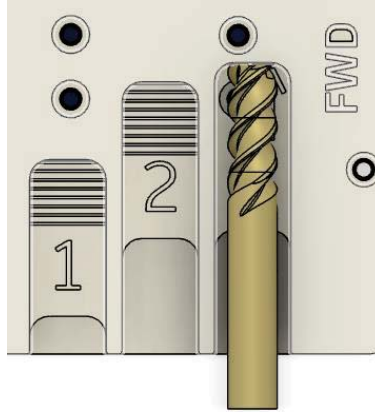


14. STOP. Before continuing to Depth Gauge #3, the #3 **(Large)** *Aluminum Spacers* must be installed on the Router Plate using 2 *Low-Profile Socket Head Screws*. Do not overtighten. Make sure the pins are fully seated. Failure to change *Aluminum Spacers* will render your lower receiver inoperable.



MILLING PROCEDURES — CONTINUED

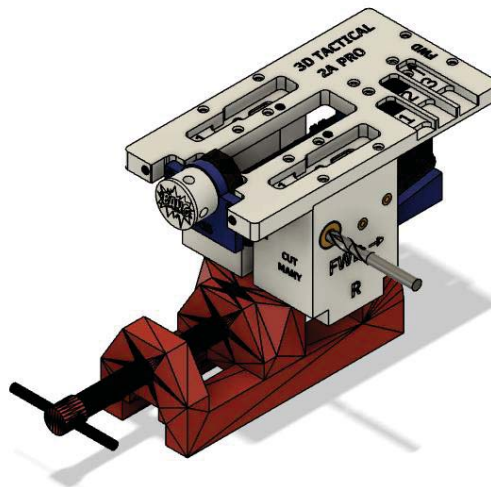
15. Set the end mill depth to the end of the Depth Gauge #3 slot. Set the depth by holding the base of Router Plate against the edge of the Top Plate. Be sure the *Aluminum Spacers* are not between the Router Plate and Top Plate. Make sure router depth adjustment is locked after each depth setting.



16. Orient the Jig so the Buffer Cap is closest to the user. Place the router on the Top Plate, with the end mill centered within the drilled hole in the receiver. The *Aluminum Spacers* should be positioned inside the #3 Top Plate slots on both sides. Hold firmly, turn the router on, and mill using consistent pressure and speed until all metal has been removed at this height.

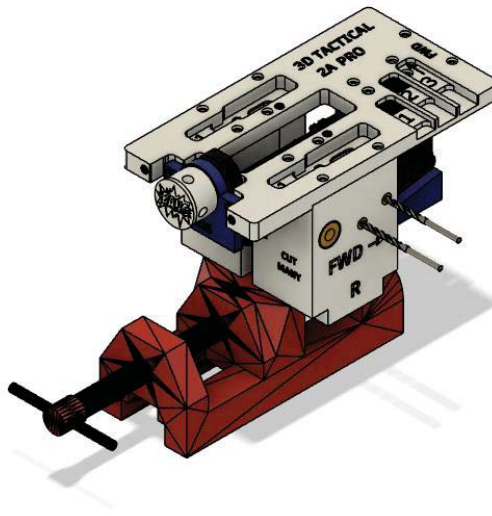
17. At this point you may place your router aside and pick up your electric hand drill.

18. Put cutting oil into the 1 larger *Press-Fit Drill Bushing* hole (Safety Selector) on either of the Left/Right Blocks and insert the 3/8" drill bit. Do not start drilling until the bit is fully inserted. While keeping the drill perpendicular to the receiver, apply moderate pressure and drill until the bit penetrates the receiver's side wall. Then insert the drill bit through the opposite Block's large *Press-Fit Drill Bushing* (Safety Selector) and drill this side the same.

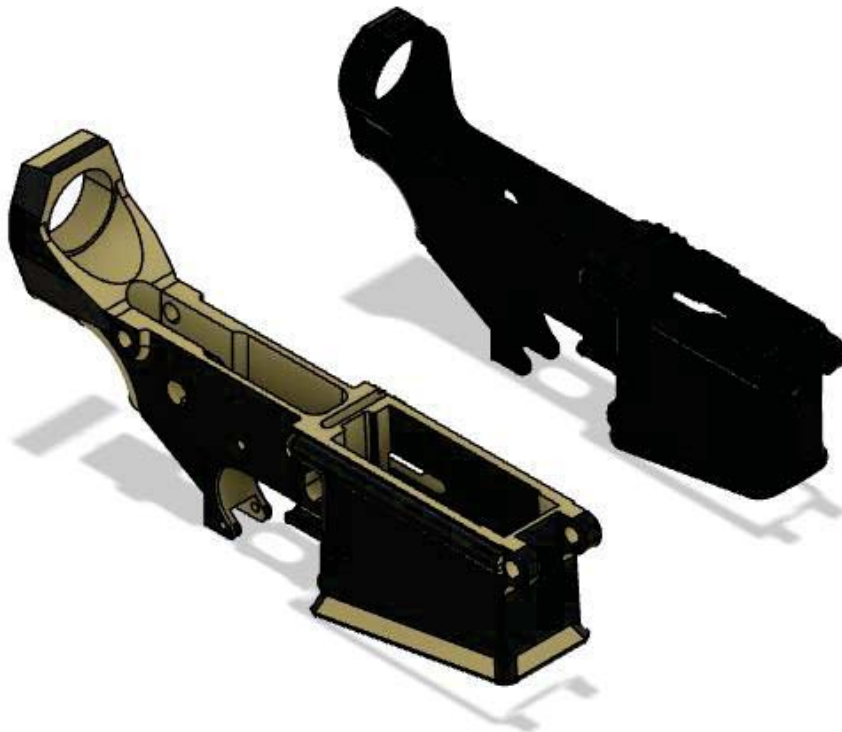


MILLING PROCEDURES — CONTINUED

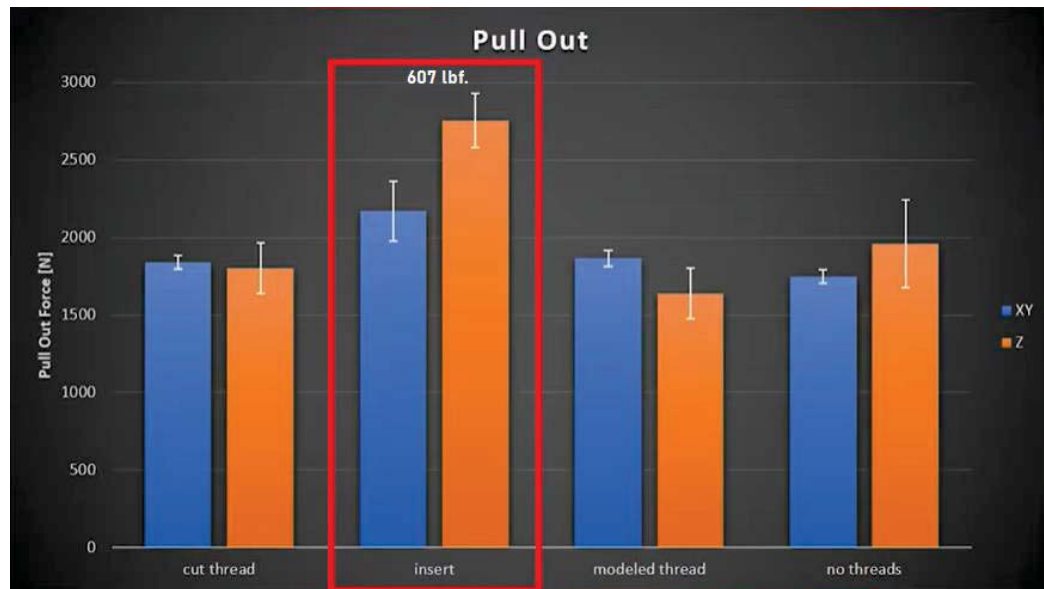
19. Put cutting oil into the 2 *Press-Fit Drill Bushing* holes (Trigger/Hammer Pins) on either of the Left/Right Blocks and insert the 5/32" drill bit. Do not start drilling until the bit is fully inserted. While keeping the drill perpendicular to the receiver, apply moderate pressure and drill until the bit penetrates the receiver's side wall. Then insert the drill bit through the opposite Block's 2 small *Press-Fit Drill Bushings* (Trigger/Hammer Pins) and drill this side the same.



You have completed the milling process.



Heat-Pressed Threaded Insert Strength Test Data

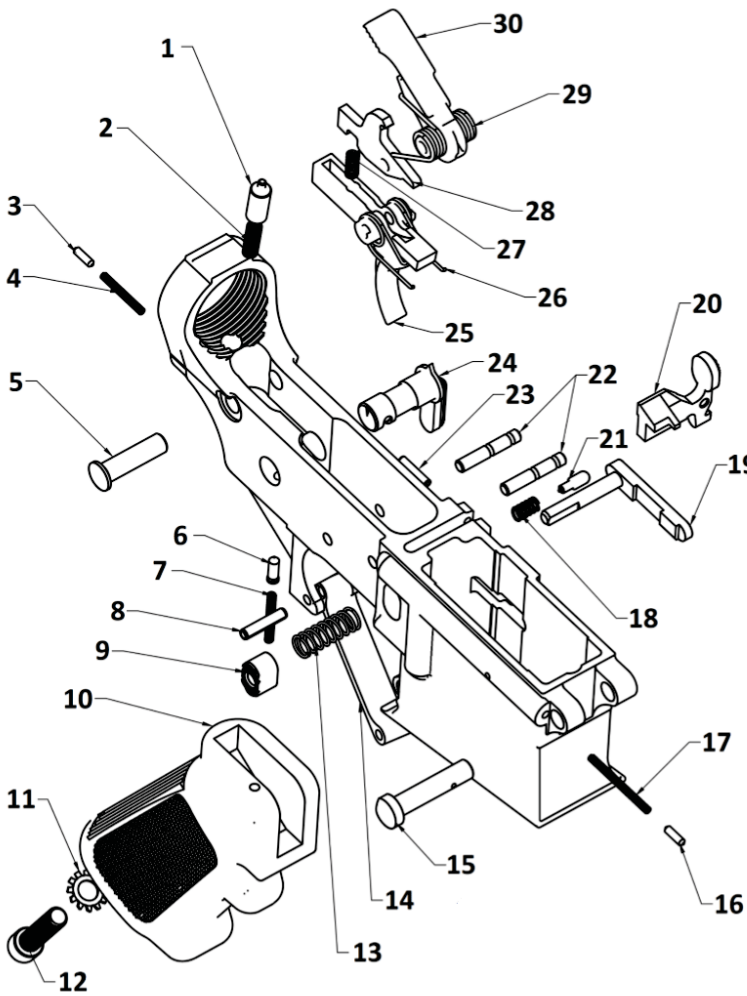


Pull-Out tests were performed with 25% infill and calibrated equipment.
All test prints were identical in size, shape, and material (PLA).



Torque-Out tests were performed with 25% infill and calibrated equipment.
All test prints were identical in size, shape, and material (PLA).

END



#	DESCRIPTION
1	BUFFER RETAINER
2	BUFFER RETAINER SPRING
3	TAKEDOWN PIN DETENT
4	DETENT TAKEDOWN PIN SPRING
5	TAKEDOWN PIN
6	FIRE CONTROL SELECT DETENT
7	SAFETY DETENT SPRING
8	TRIGGER GUARD ROLL PIN
9	MAG BUTTON
10	PISTOL GRIP
11	LOCK WASHER
12	PISTOL GRIP SCREW
13	MAGAZINE CATCH SPRING
14	TRIGGER GUARD
15	PIVOT PIN
16	TAKEDOWN PIN DETENT
17	DETENT TAKEDOWN PIN SPRING
18	BOLT CATCH SPRING
19	MAG CATCH
20	BOLT CATCH
21	BOLT CATCH PLUNGER
22	HAMMER & TRIGGER PIN
23	BOLT CATCH ROLL PIN
24	SAFETY SELECT
25	TRIGGER
26	TRIGGER SPRING
27	DISCONNECT SPRING
28	DISCONNECT
29	HAMMER SPRING
30	HAMMER