

# Bjansen - Ultimate 2x72 Belt Grinder

Note: Prices of metal fluctuate significantly. Xometry.com or sometimes Onlinemetals.com is often the cheapest - make sure and search for coupon codes

## Metals Listing

You can buy from OnlineMetals - or various other cut to size providers

Part Name/Use	Quantity	Total Price
1/2" x 8" x 20" 6061-T6511 Aluminum flat bar	1	\$ 38.23
1/2" x 8" x 8" 6061 - T6511 Aluminum flat bar	1	\$ 14.58
1/2" x 8" x 12" 6061-T6511 Aluminum flat bar	1	\$ 14.04
1-1/8" x 4" 6061-T6511 Aluminum round bar rod	1	\$ 1.30
1/2" x 2-1/2" x 8.5" 6061-T6511 Aluminum flat bar	2	\$ 6.48
1-1/2"x 3" x 8" 6061-T6511 Aluminum flat bar	1	\$ 8.75
1/2" x 1-1/2" x 12" 6061-T6511 Aluminum flat bar	1	\$ 1.94
1" x 1-1/2" x 8" 6061-T6511 Aluminum flat bar	1	\$ 7.00
3/4" x 1-1/2" x 8" 6061-T6511 Aluminum flat bar	2	\$ 9.00
3/4" x 1-1/2" x 2" 6061-T6511 Aluminum flat bar	1	\$ 1.08
1" x 2" x 8.5" 6061-T6511 Aluminum flat bar	1	\$ 5.18
3/4" x 1" x 2" 6061-T6511 Aluminum flat bar	2	\$ 2.00
Aluminum tube .26" ID, .50 OD 1 1/8" long	4	\$ 6.00
3/8" x 2" x 6" 1018 Steel flat bar <i>(size the rest to your liking)</i>	1	\$ 6.41
1-1/2" Aluminum 6061 Square Bar - 18" Length <i>(I typically buy a 36" bar and cut a 13-16" piece off to use as the platen tool arm and the longer remaining section to use as the work rest tool arm).</i>	2	\$ 26.40
Shipping		\$ 30.00
<b>Total Metal Cost</b>		<b>\$ 178.39</b>

## Major Parts

Part Name/Use	Quantity	Total Price
Tracking wheel (Ebay - Ameribrade is a good choice)	1	\$ 30.00
Drive wheel (Ameribrade or any other ebay seller) <i>Notes: Buy your motor first and then match the drive wheel to the shaft size of your motor. Buy a drive wheel size that is suited for your motor speed. If you are building a general use, variable speed grinder I would suggest a 5" or 6" drive wheel. If you are building a single speed general use grinder (3600 rpm motor) I would suggest getting a 4" drive wheel.</i>	1	\$ 55.00
Motor- (find one on ebay) <i>Notes: Ideally you will be building a variable speed grinder which requires a VFD and a 3 phase motor. Search ebay for a 3-phase, 208-230v, 1750RPM motor anywhere from 1-3HP. The motor needs to have a c face such as the following types of baldor motors (VM3554 or VEM3554, VM3558 or VEM3558). The frame size needs to ideally be 145TC or 56C. This specific item may take a bit of homework and searching, but you can save a bunch of money on this specific piece rather than buying a brand new motor. I have purchased several Baldor motors on ebay (in new or near new condition) priced between \$65 and \$200, depending on HP, shipping included. I am certain you can find a good motor for \$150.</i>  <i>Single Phase Motor Notes: For a single phase motor, again find a 56C or 145TC frame size and 3450 or 3600 RPM. When using single phase for a general purpose grinder, I typically run a 4" drive wheel on a 3450 or 3600 RPM motor this combo gives you a belt speed of about 3700 surface feet per minute which is good for general purpose tasks. You can run a 1.5HP motor on a 20 AMP 110V circuit and you can run a 2HP or 3HP single phase motor on a 220V circuit (so make sure you are thinking about your power source when purchasing the motor).</i>	1	\$ 150.00

<b>Only needed for a variable speed grinder</b> (for use with your 3 phase motor) KB Electronics KBAC 29D- Variable Frequency Drive - Fwd reverse switch, line switch. The KBAC 29 will run up to a 3HP motor, a KBAC 27 will run up to a 2HPa and a KBAC 24D ill run up to a 1HP motor. The last KBAC 29D I purchased was from Texas Process for \$345 - shipped. The forward stop reverse switch and line on/off switch will cost you another \$50 and can be bought from a number of different sellers.	VFD		1	\$	400.00
Electric supply: cords, wire & liquid tite fittings for VFD to motor (Note: For the VFD to the motor, you will need 14 gauge, 4 strand power supply wire (McMaster Carr has this - so does Home Depot). The Power supply cord will depend on whether you are running 110v or 220v, and these supply cords can be found in any hardware store. Amazon.com has cheap liquid tight fittings.	Misc. Electrical cords		1	\$	50.00
<b>Contact wheel or platen:</b> This is where you can decide how you would like to set up your grinder. If you would like a contact wheel, they can be purchased from many suppliers and bolted to your tool arm. I often buy my contact wheels from AliExpress (specifically a Rams Bralin contact wheel). The quality is decent, and price is very good. They sell all sizes and can install 1/2" bearings, or you can buy them ready for bearings and install your own. Ameribrade also has good contact wheels (which I think are the same Chinese wheels, with better bearings and balanced). If you are looking for a flat platen, they are easy to make your self and also available from many sellers - just do a search, find one you like and bolt it on your tool arm.	Contact wheel		1	\$	65.00

#### Hardware

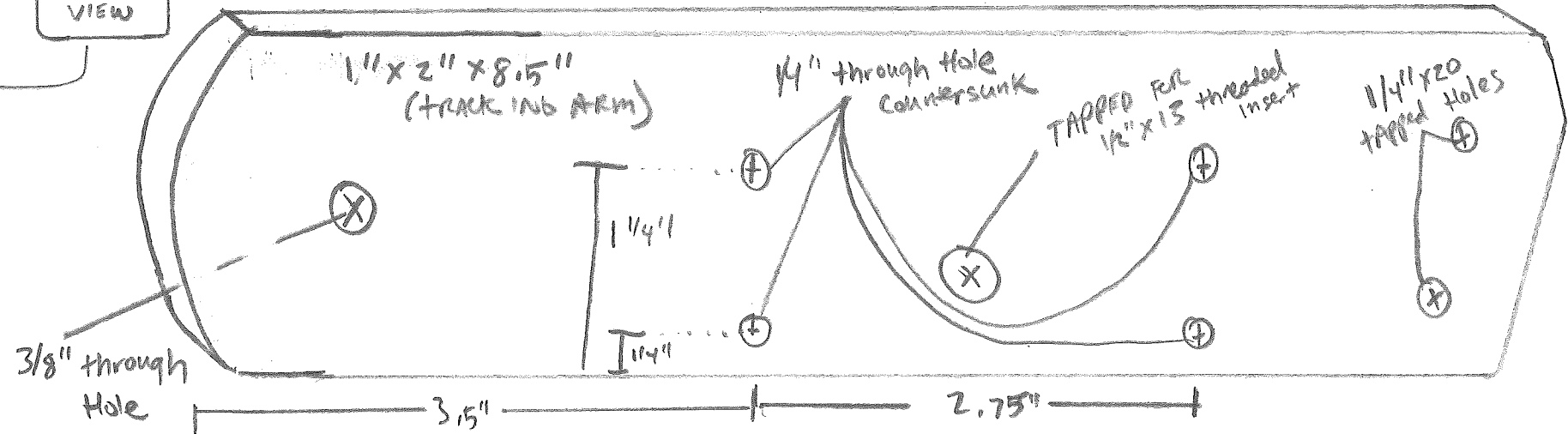
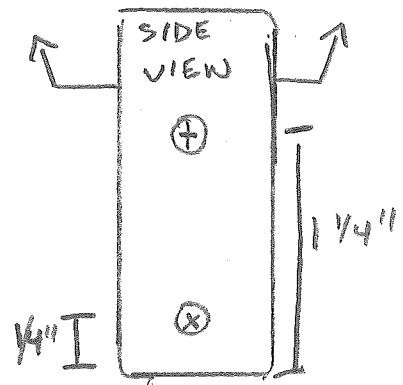
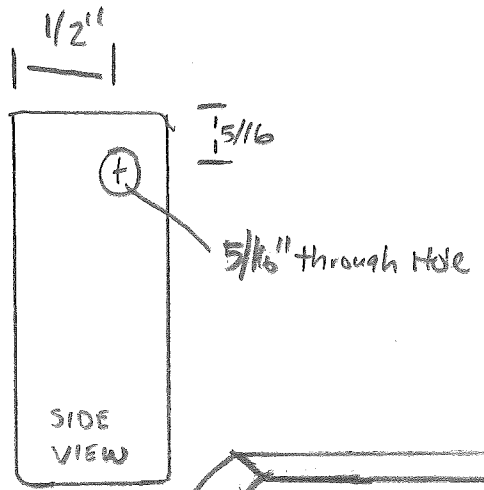
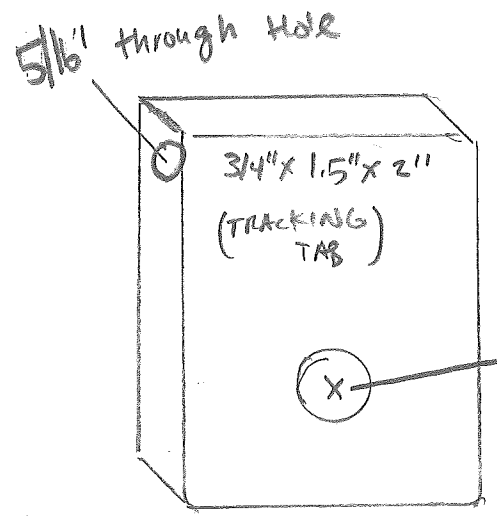
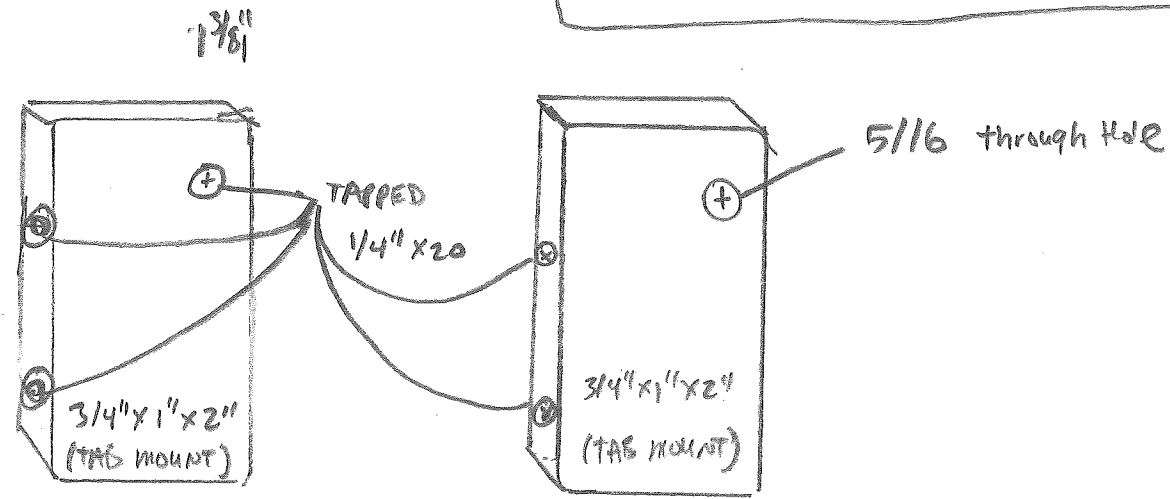
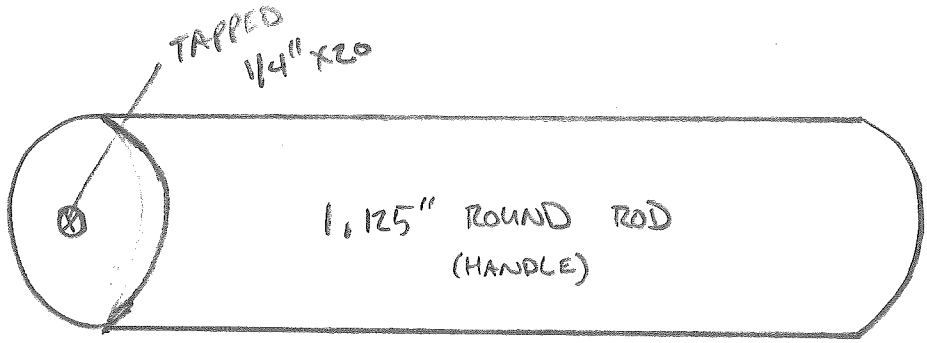
Gas Spring with Ball-Joint End Fitting, 40 lb. Force, 12.2" Extended Length McMaster Carr # 4138T54	Gas Shock		1	\$	17.00
Gas Spring mounting bracket McMaster Carr # 9512K95	Gas shock mounting bracket		1	\$	2.00
10-24 x 3/8" long socket cap screws - McMaster Carr or hardware store	Gas shock bracket mounting screws		2	\$	1.00
Die Cast Zinc Adjustable Handle, 5/16"-18 Thread x 1-3/16" Long Stud, 2-9/16" Long Handle McMaster Carr # 6271K22	Locking handles		2	\$	16.52
2.5" Stainless flat cap bolts - 1/4"-20 10 pack - McMaster Carr	Assembly bolts		2 packs	\$	12.42
1 1/4" Stainless flat cap bolts - 1/4"-20 - 25 Pack - McMaster Carr	Assembly bolts		1 pack	\$	6.01
Shoulder Screw, 3/8" Diameter x 1-3/4" Long Shoulder, 5/16"-18 Thread - McMaster Carr #91259A630	Shoulder bolt for tracking arm bar		1	\$	1.70
PTFE Thrust Bearing for 3/8" Shaft Diameter, 3/4" OD, 1/16" Thickness McMaster Carr #2796T12	Bearings for tracking arm		2	\$	3.96
Lubricant-Filled Nylon Plastic Washer, .322 ID - They come in packs of 5 (you only need 2 individual washers) McmasterCarr # 91545A260	Nylon washer for tracking tab		1 pack	\$	2.54
18-8 Stainless Steel Shoulder Screw, 5/16" Diameter x 2.5" Long Shoulder, 1/4"-20 Thread McMaster Carr # 91259A109	Shoulder bolt for tracking tab		1	\$	5.10
18-8 Stainless Steel Shim, .020" Thick, 1/4" ID, 3/8" OD, packs of 10 - McMaster Carr #98126A568 (you will need exactly 12 shims)	Shim washers (to properly space tool bar openings)		2 packs	\$	7.58
4" 1/2-13 thread bolt, nut - McMaster Carr or local hardware store	Tracking wheel bolt		1	\$	2.00
Iron Knob with 5/16"-18 Thread 3" Long Stud McMaster Carr # 6042K88	Tracking adjustment screw		1	\$	8.70
3/8" SS bolts, 1" long and washers McMaster Carr or local hardware store	Motor mount bolts		4	\$	5.00
Steel Thrd-locking Slotted Thick Wall Insert, 5/16"-18 Int Thread, 31/64" Length (McMaster Carr # 90248A027 )	Steel threaded inserts for tool bar locking handles		1		10.25
	Shipping			\$	15.00
	Total Accessory/Hardware costs			\$	867

**All in grinder cost** **\$ 1,045**  
**Approx build time:** **about 10-15 hours**

The "ULTIMATE" 2x72 Grinders

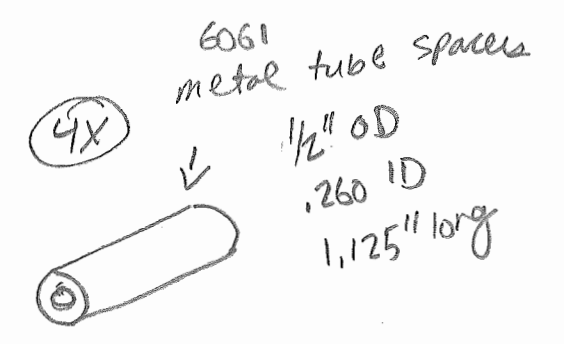
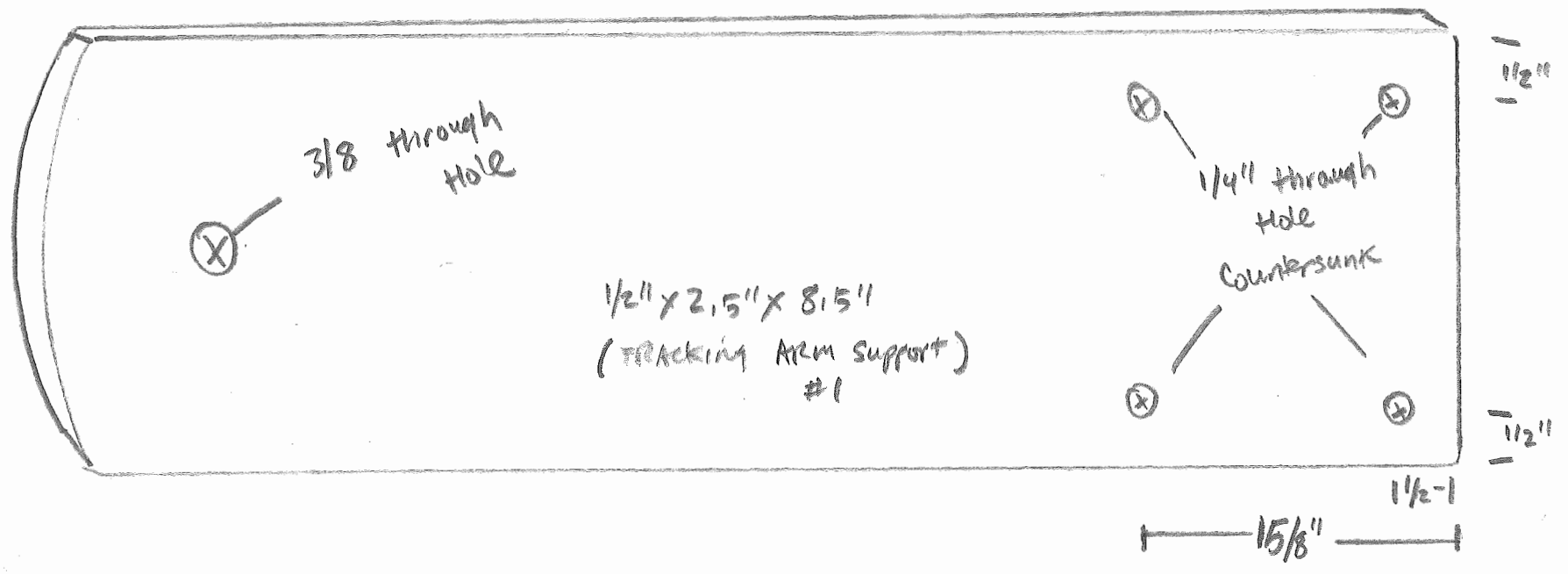
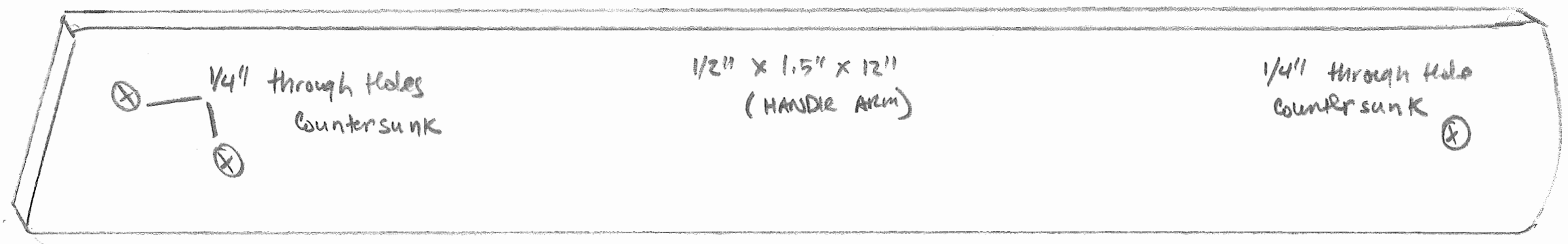
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SCANNED ON  
Legal letter SIZE PAPER  
8.5" x 14"

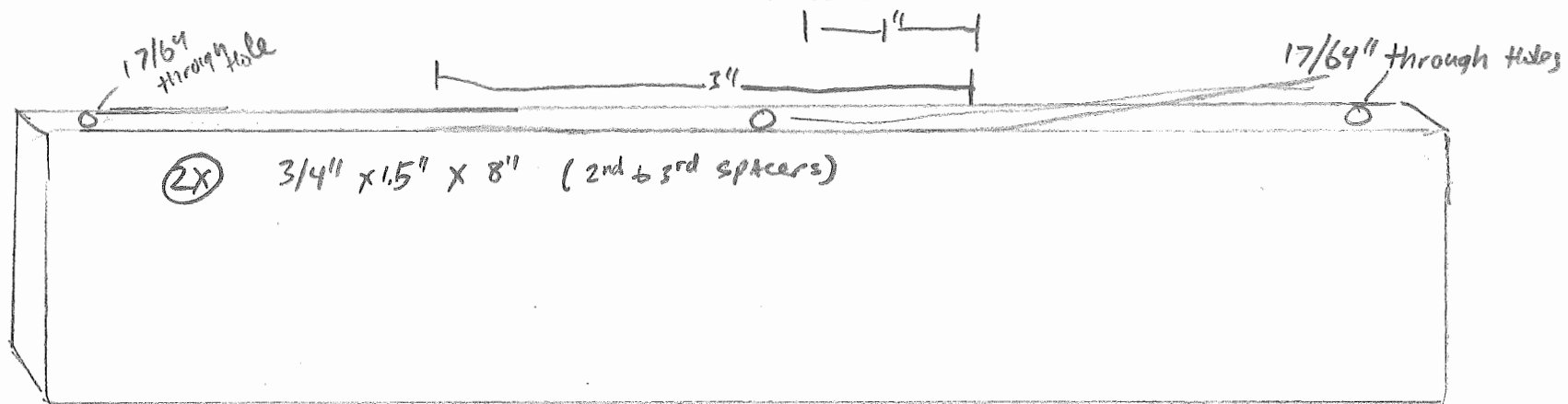
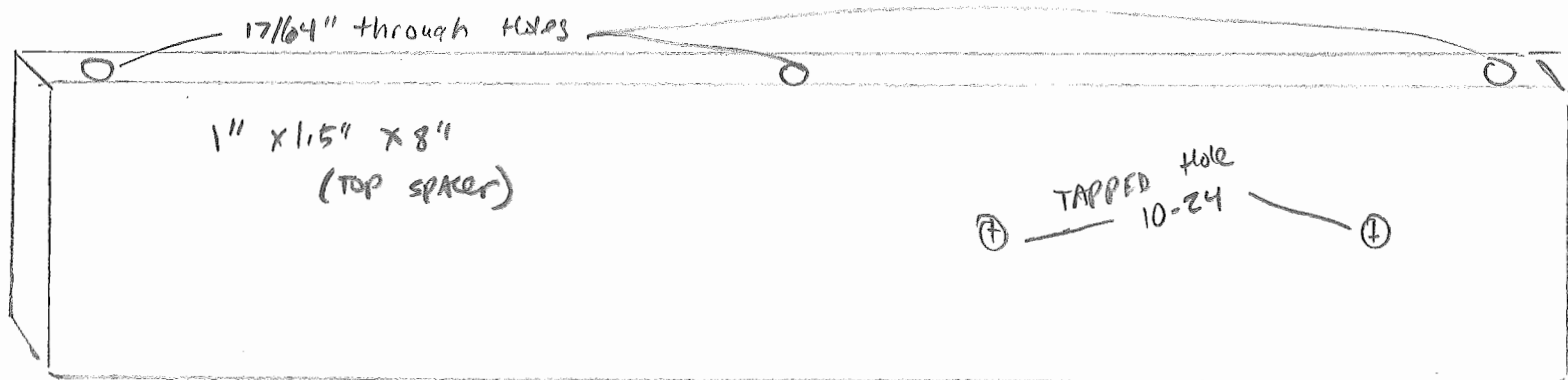
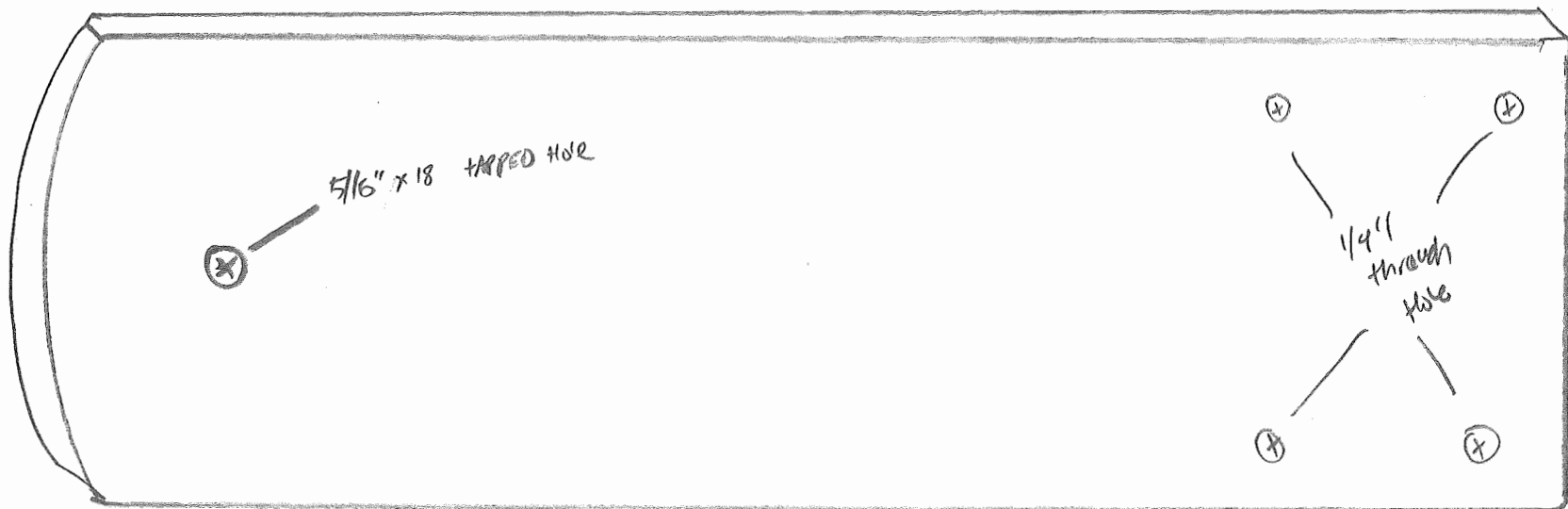


Scal for 18

(ALL MEASUREMENTS DRAWN TO CENTER OF HOLE)



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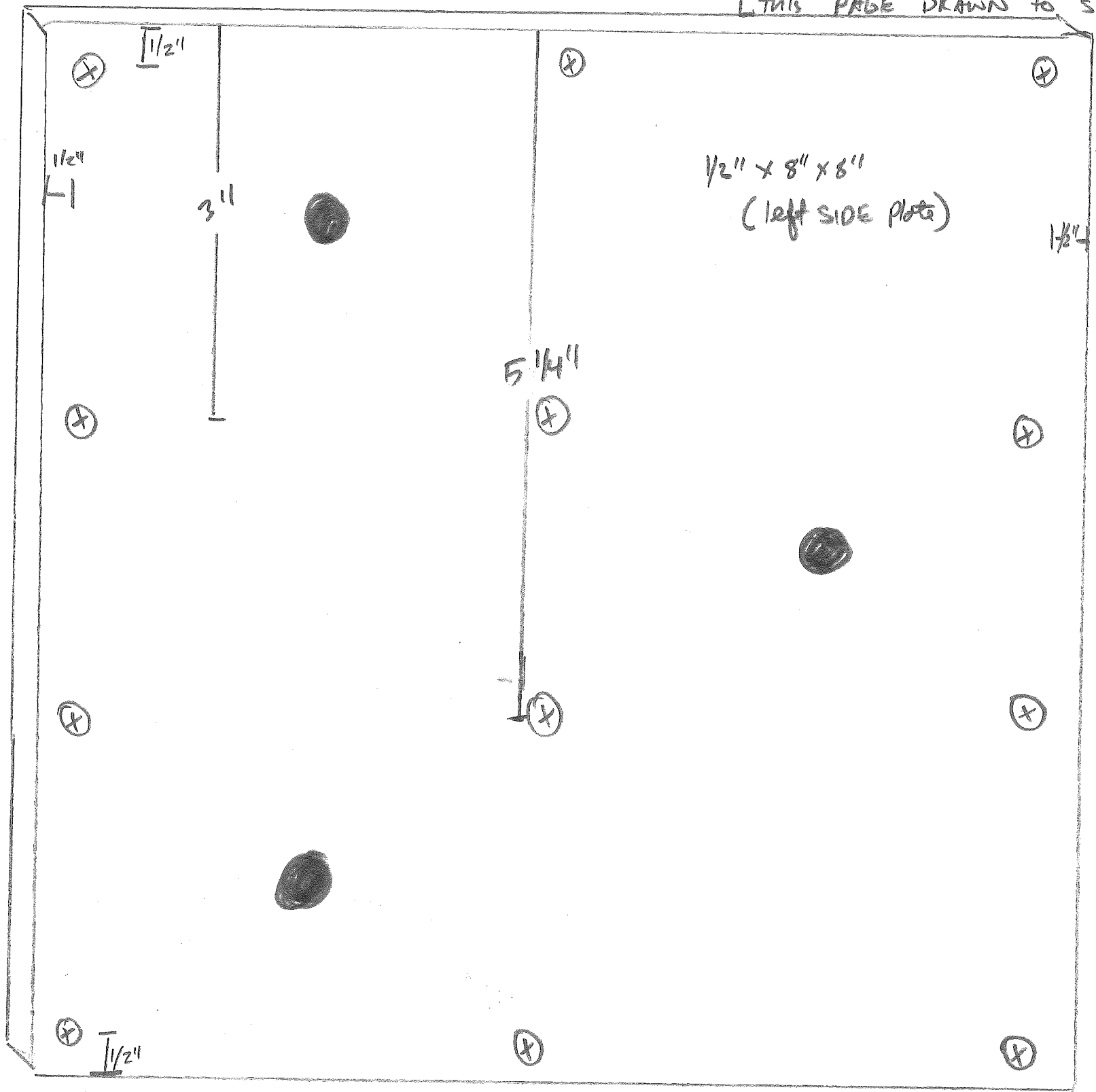


Back from 18"

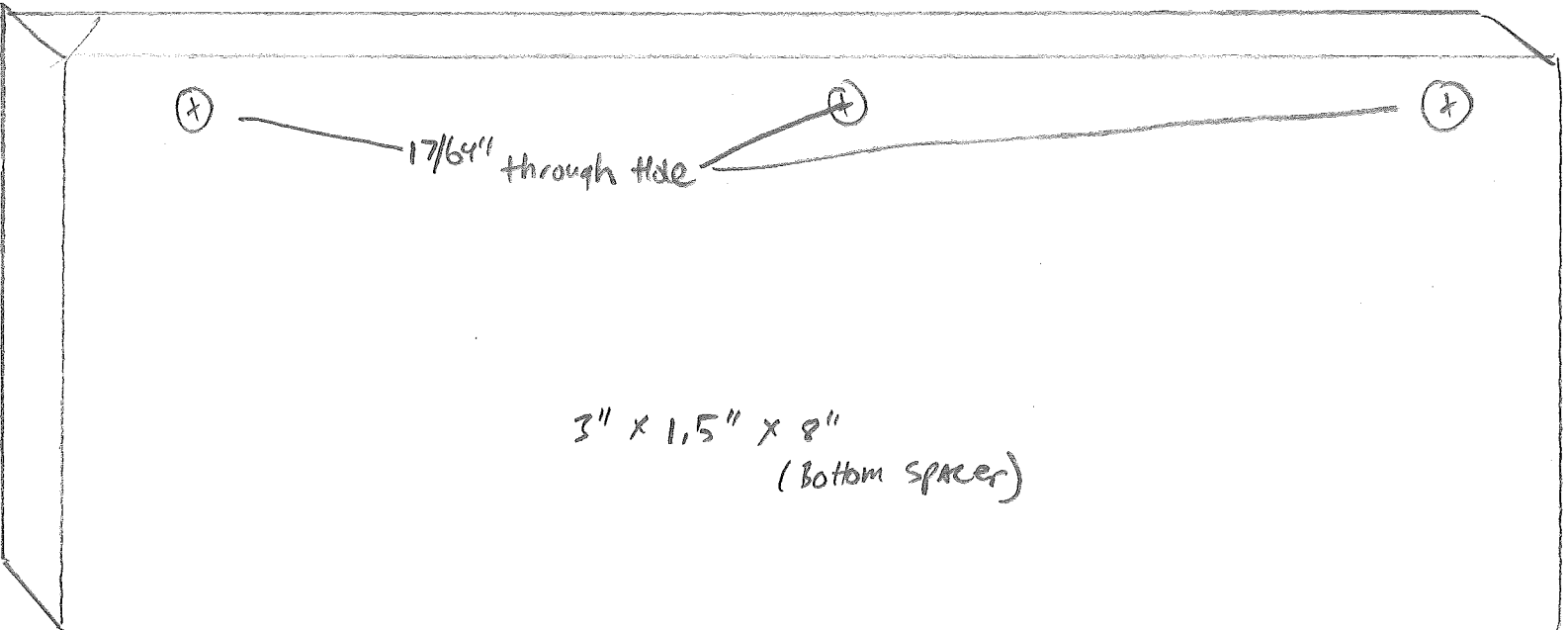
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⊗ = 1/4" through hole  
counter sunk

● = 1/2" x 13 TAPPED  
hole for a threaded  
insert

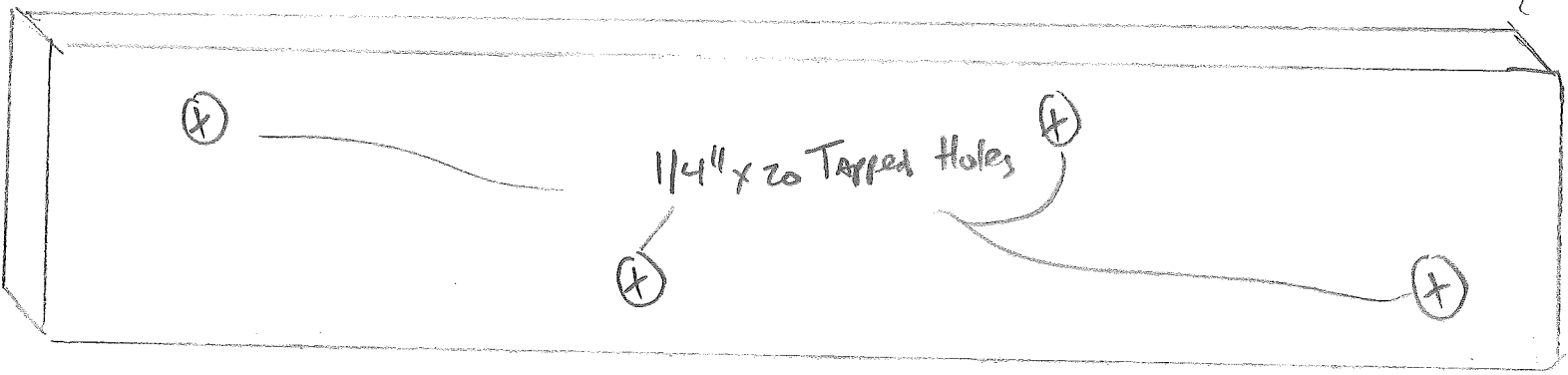


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3" x 1.5" x 8"  
(Bottom spacer)

Bottom  
SIDE



1 1/4" x 20 Tapped Holes

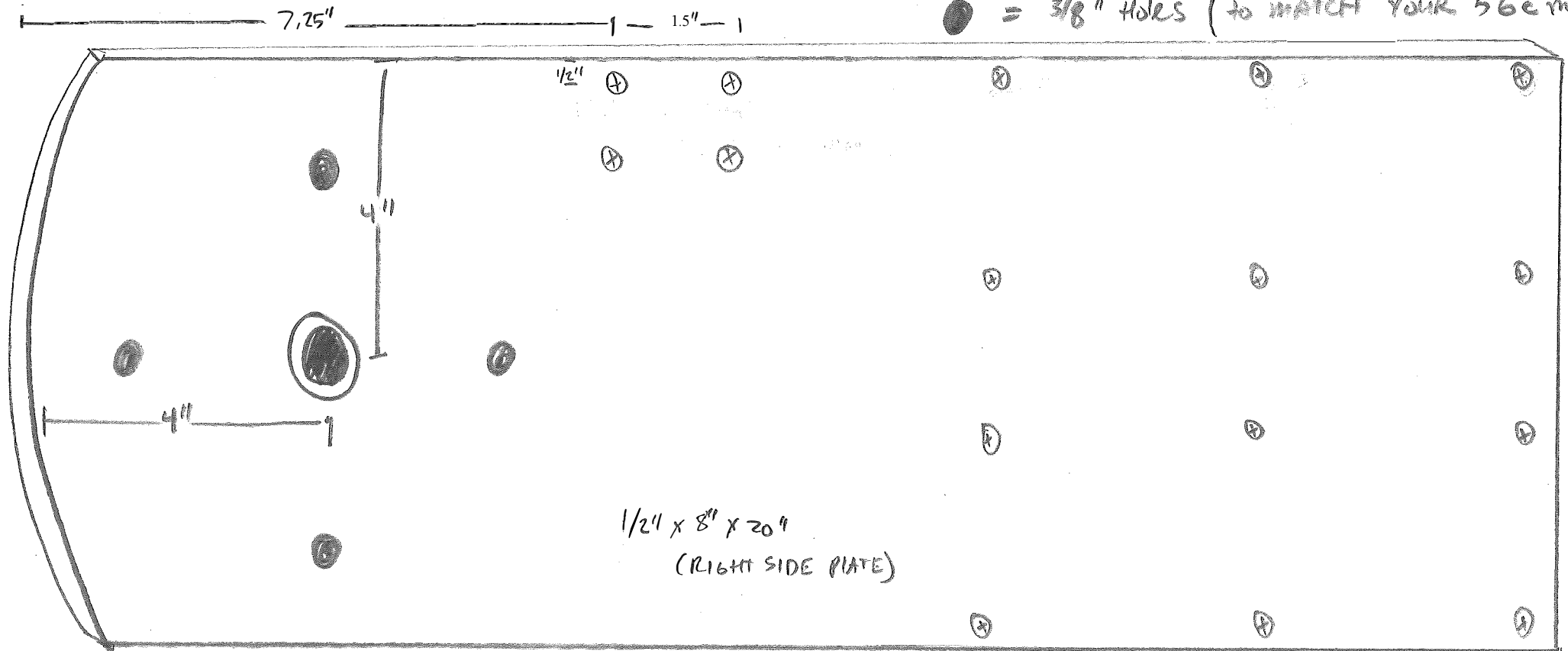
Back 18'

NOTE: PAGE DRAWN @ 50% SCALE

⊕ = 1/4" TAPPED HOLE

⊙ = 1" HOLE

● = 3/8" HOLES (to MATCH YOUR 56c motor face)



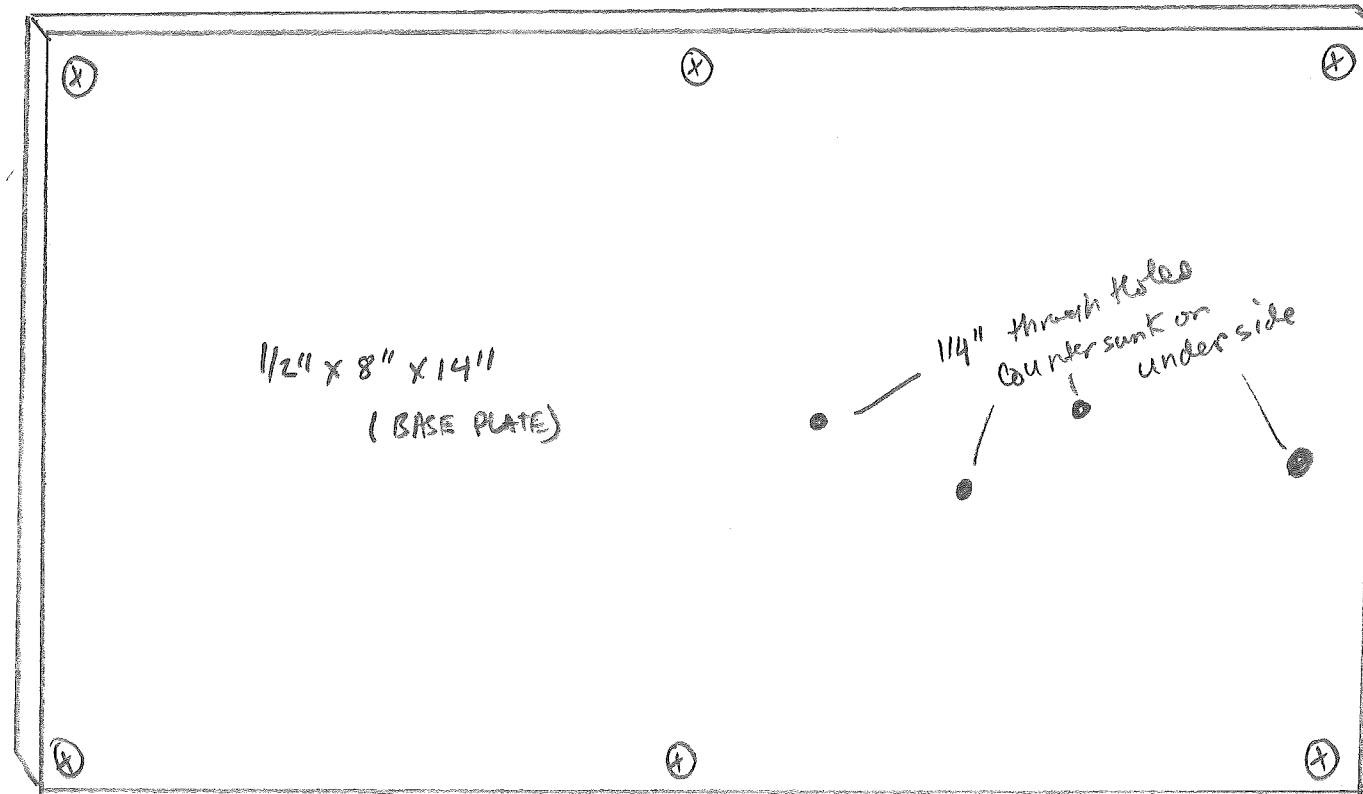
1/2" x 8" x 20"  
(RIGHT SIDE PLATE)

To provide relief for the C face motor, consider simply cutting the center shaft motor hole with a 4.5" hole saw. This will provide the relief needed such that the motor can bolt flat to the aluminum plate

Blum 18'



Note: PAGE DRAWN @ 50% scale



⊗ = Holes to mount BASE to your work bench, I typically make them 1/4" or 3/8"

Hope you like these PLANS  
→ Good Luck! →

If you need help or have questions, I can generally be reached at 618-579-9689 on weeknights between 8PM and 9PM CST.

Apr 18'

# BJANSEN'S ULTMATE BELT GRINDER 2019 =

## BASE PLATE

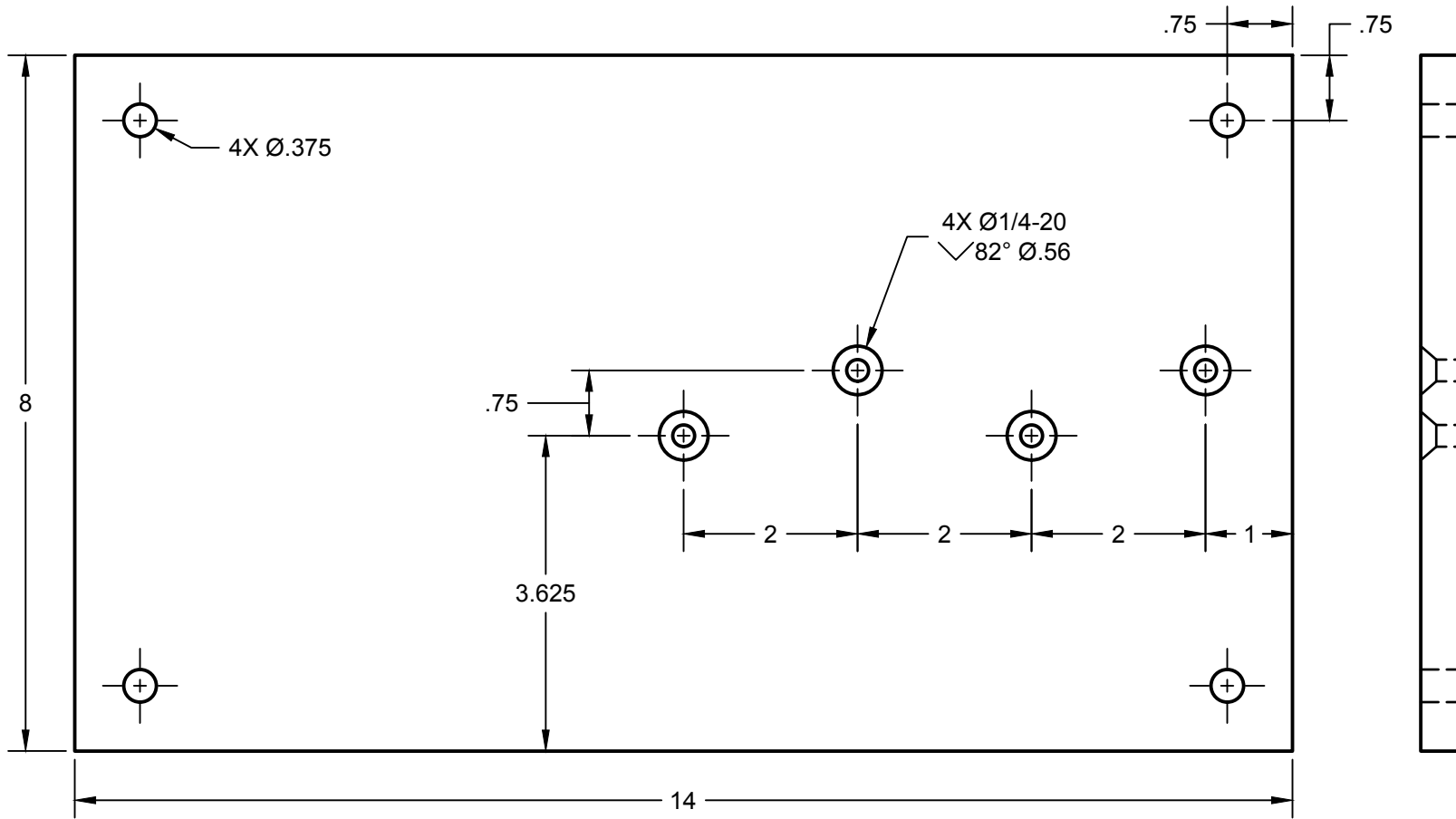
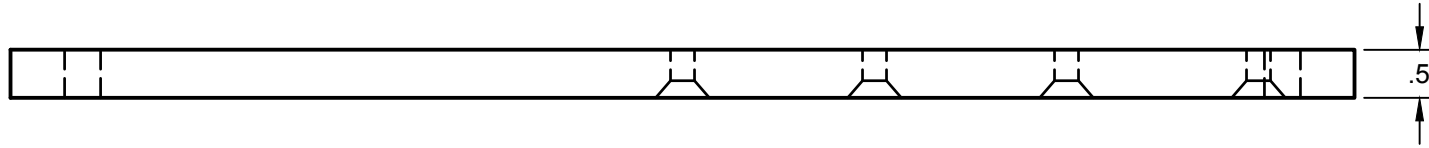
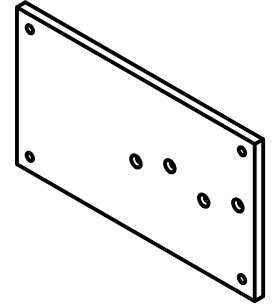
1:2

1/2 X 8 X 14 Aluminum

Page 1 of 12

NOTE: Dimensions given for most unthreaded holes are for associated hardware, not clearance hole sizes

These PDF drawings were graciously provided by my buddy Fitzhugh

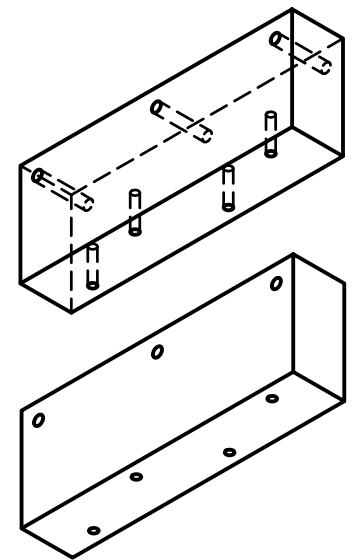
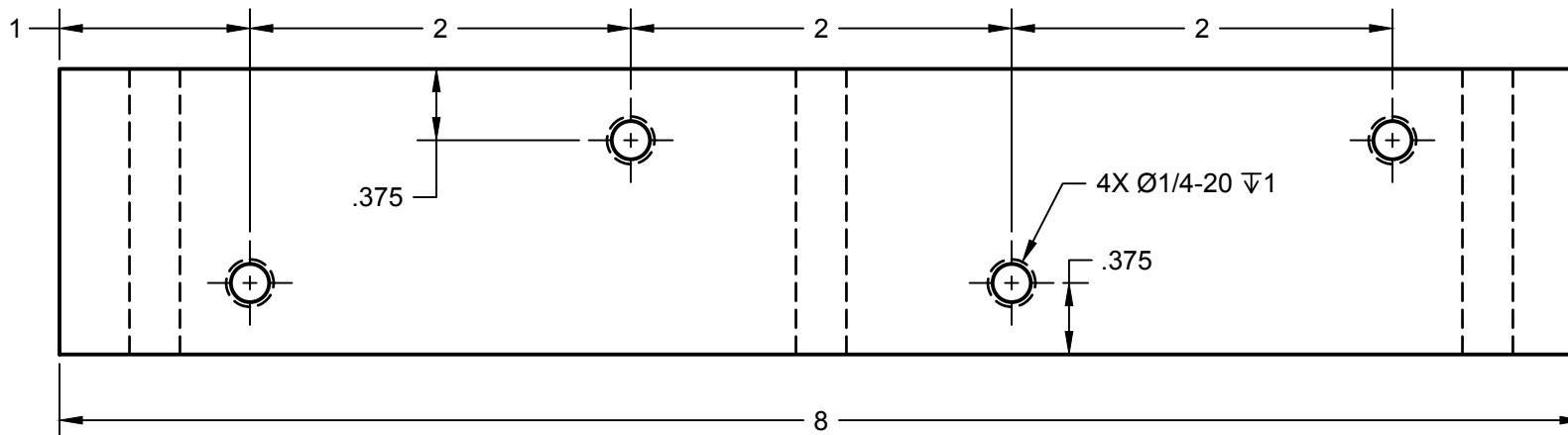
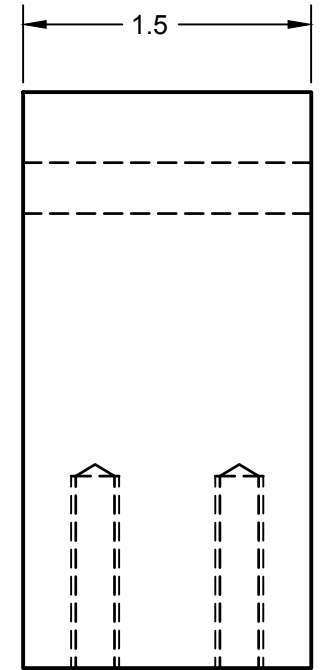
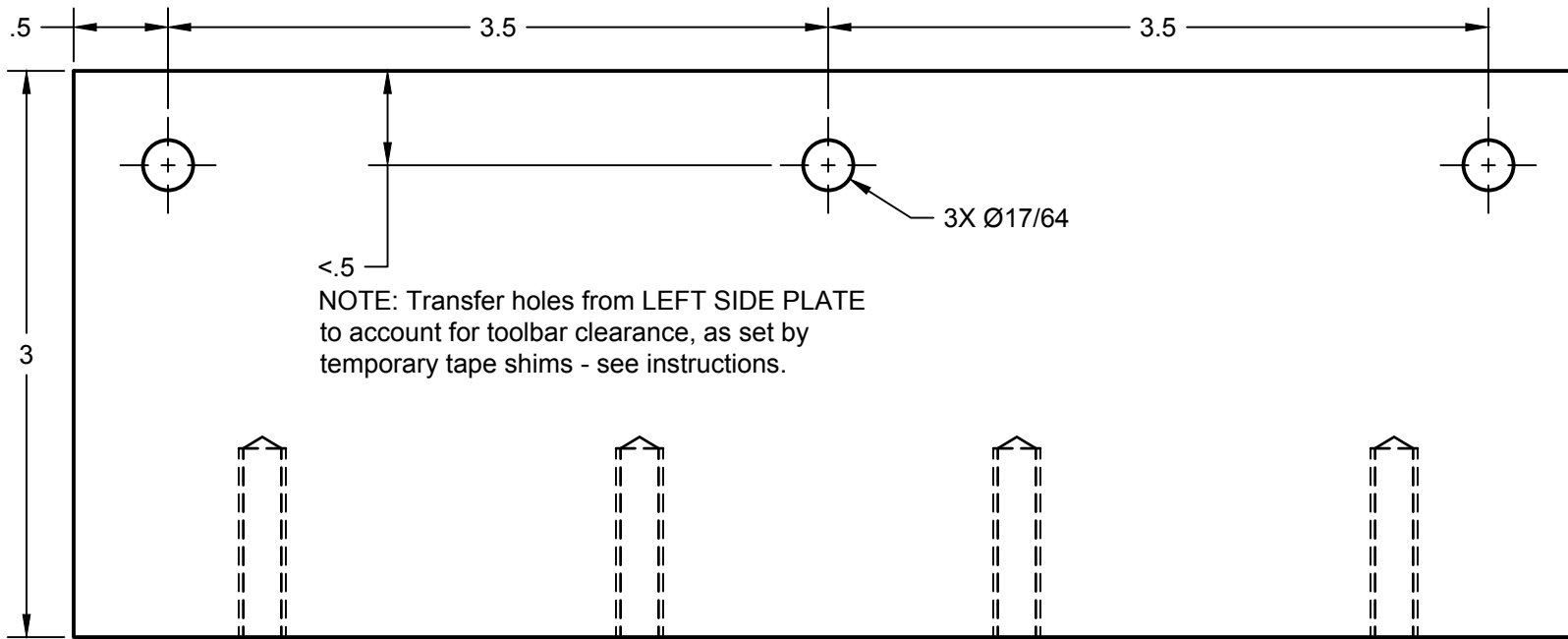


# BOTTOM SPACER

1:1

1.5 x 3 x 8 Aluminum

Page 2 of 12

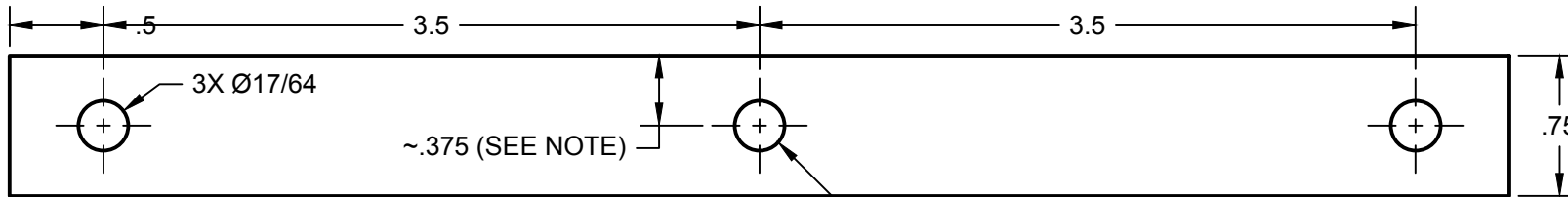
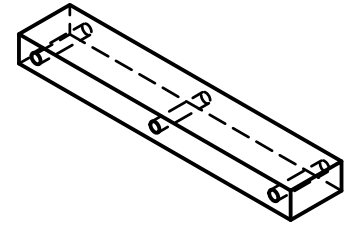
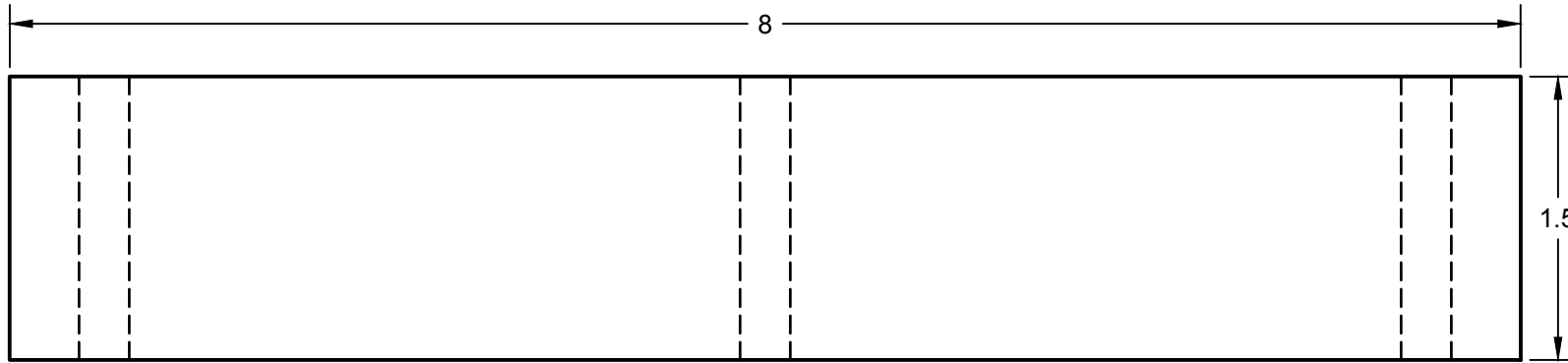


### MIDDLE SPACERS (2 REQ)

1:1

3/4 X 1.5 X 8 Aluminum

Page 3 of 12

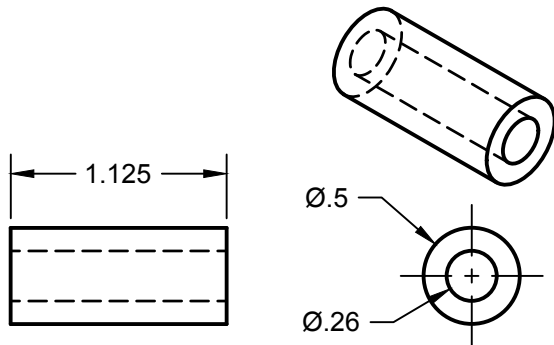


NOTE: Transfer holes from LEFT SIDE PLATE to account for toolbar clearance, as set by temporary tape shims - see instructions.

### TRACKING SUPPORT SPACERS (4 REQ)

1:1

0.26 ID 0.5 OD X 1.125 Aluminum Tube

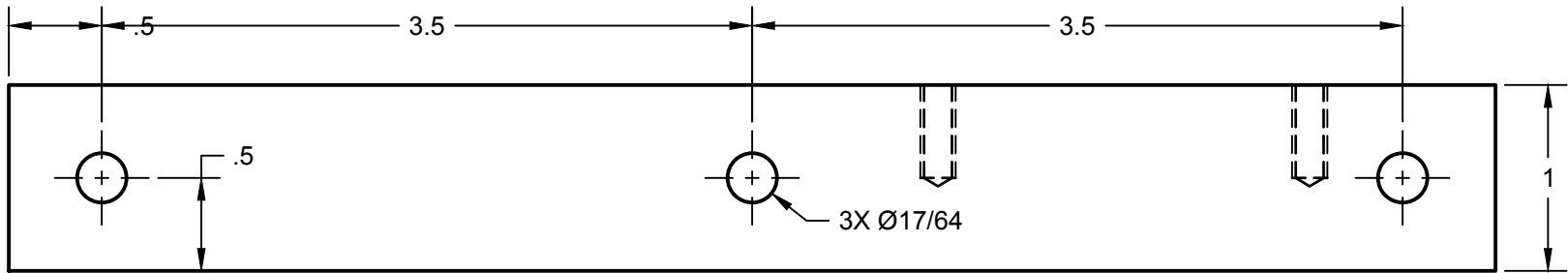
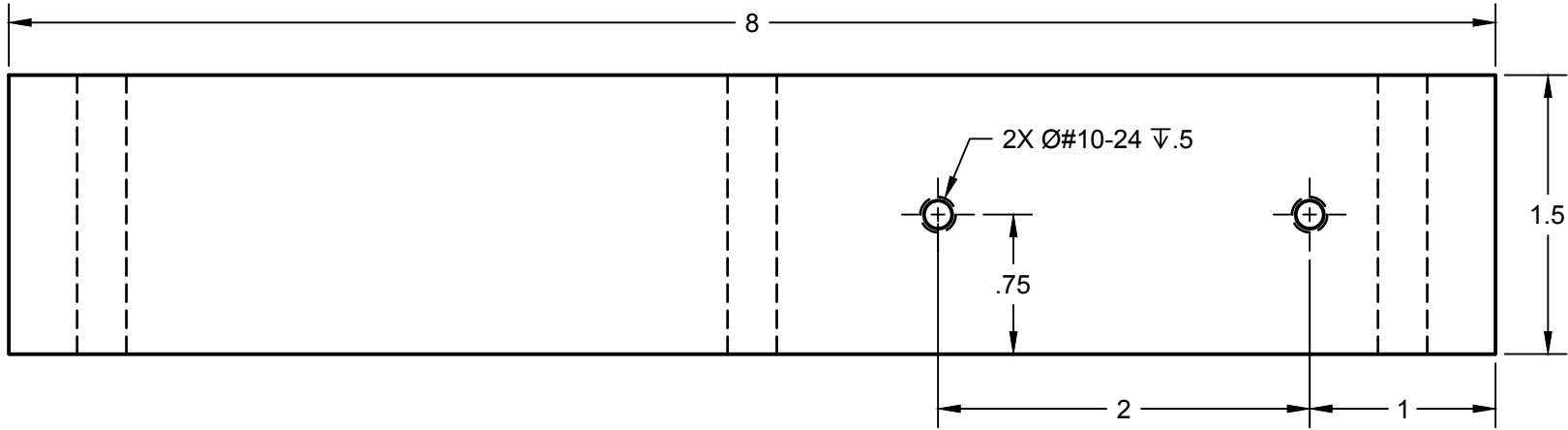
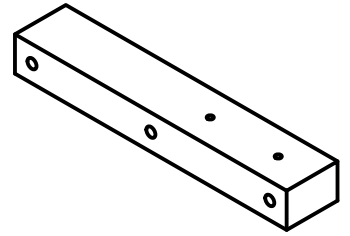


# TOP SPACERS

1:1

1 X 1.5 X 8 Aluminum

Page 4 of 12

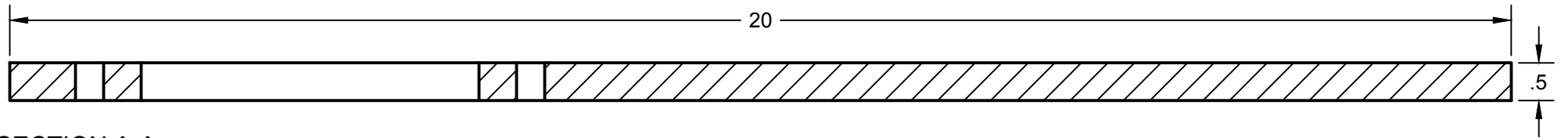
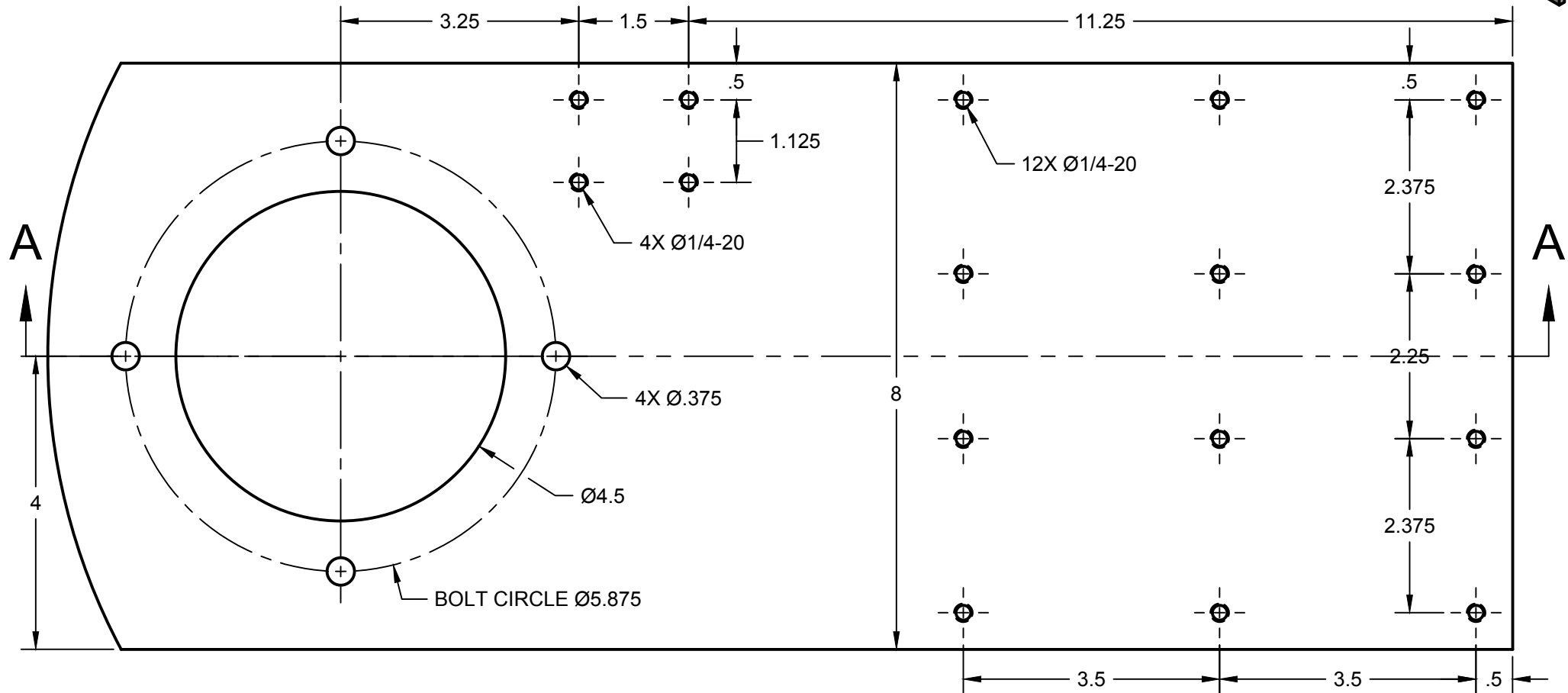
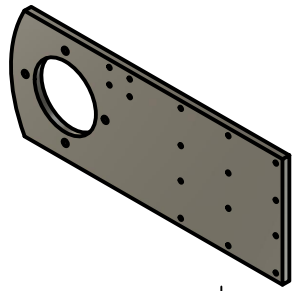


# SIDE PLATE, RIGHT

1:2

1/2 X 8 X 20 Aluminum

Page 5 of 12



SECTION A-A  
SCALE 1:2

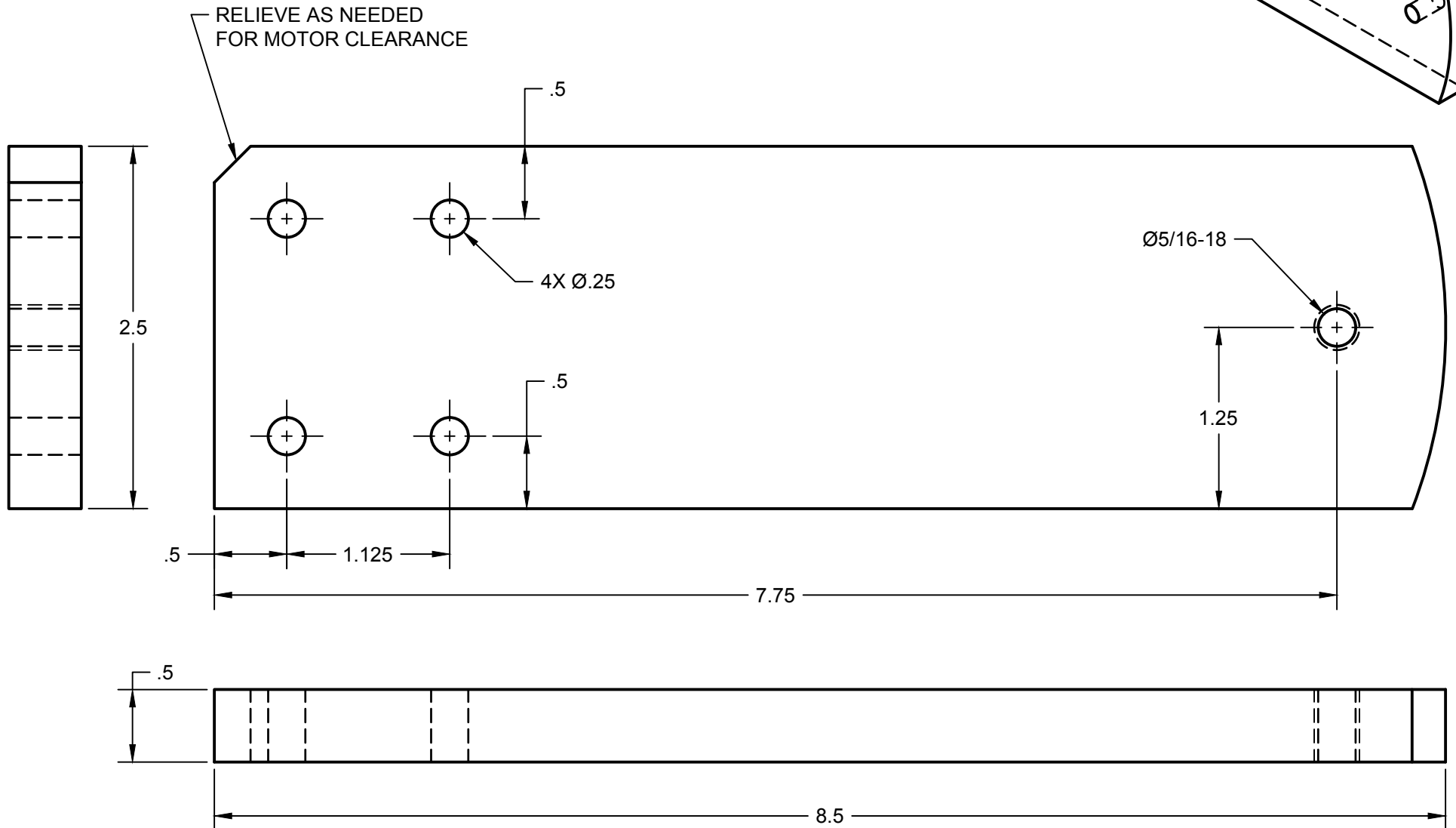
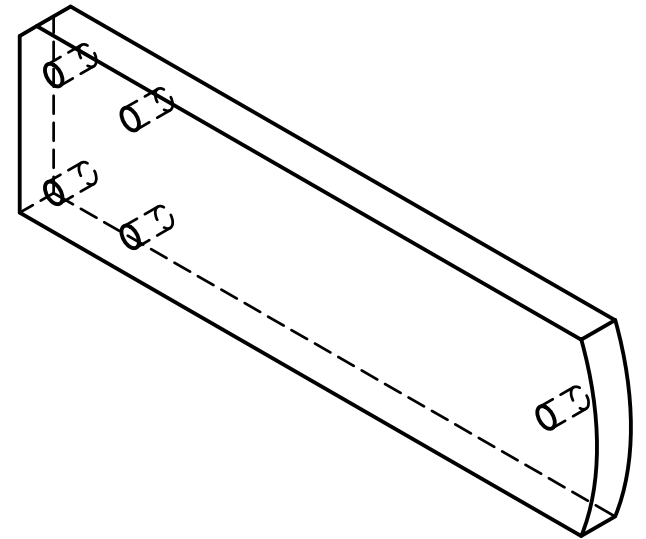


# TENSION & TRACKING SUPPORT, RIGHT

1:1

1/2 X 2.5 X 8.5 Aluminum

Page 7 of 12



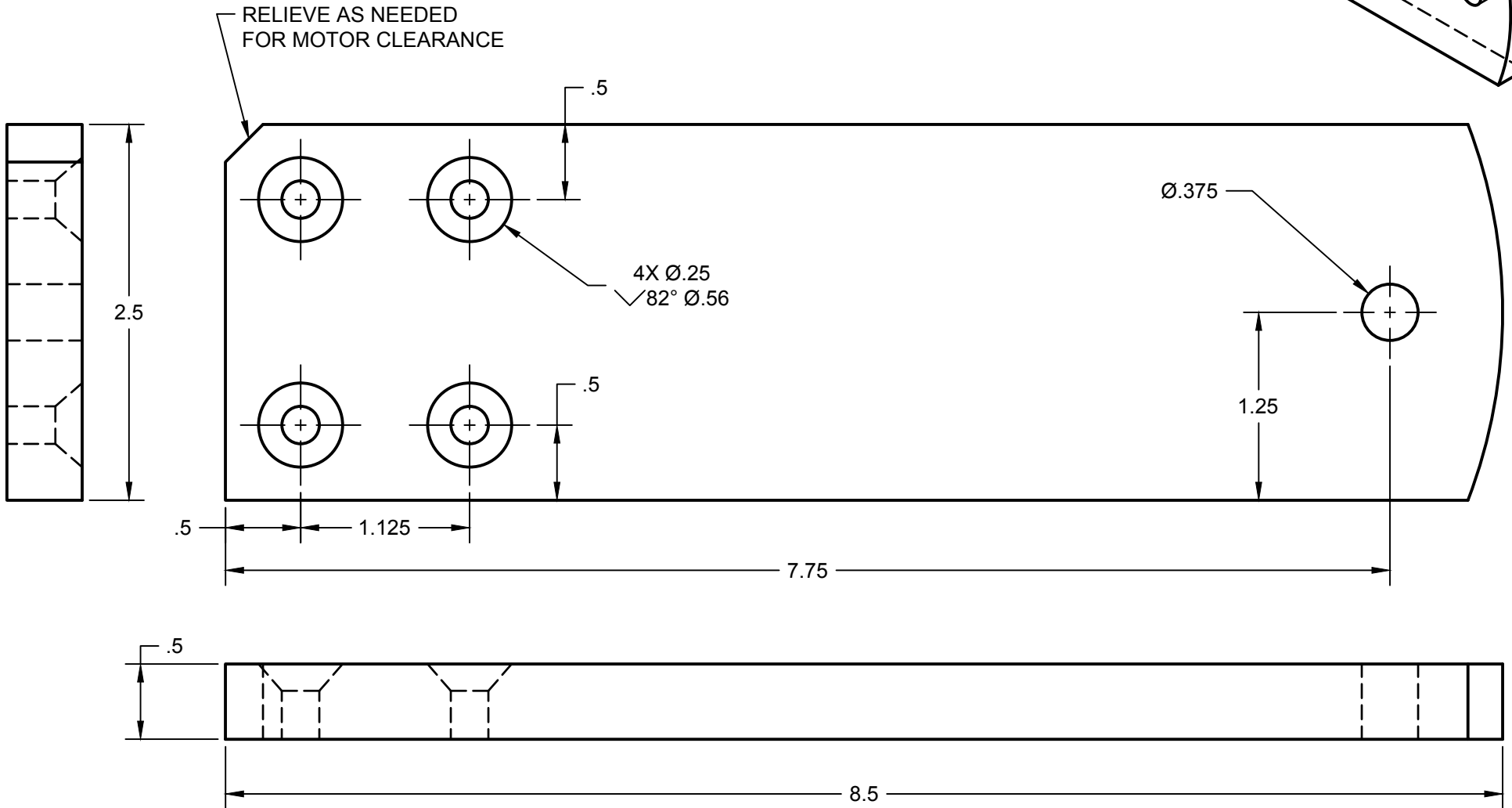
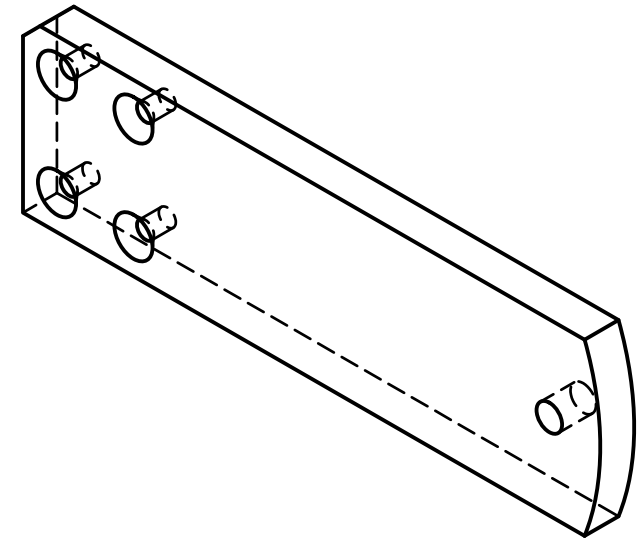


# TENSION & TRACKING SUPPORT, LEFT

1:1

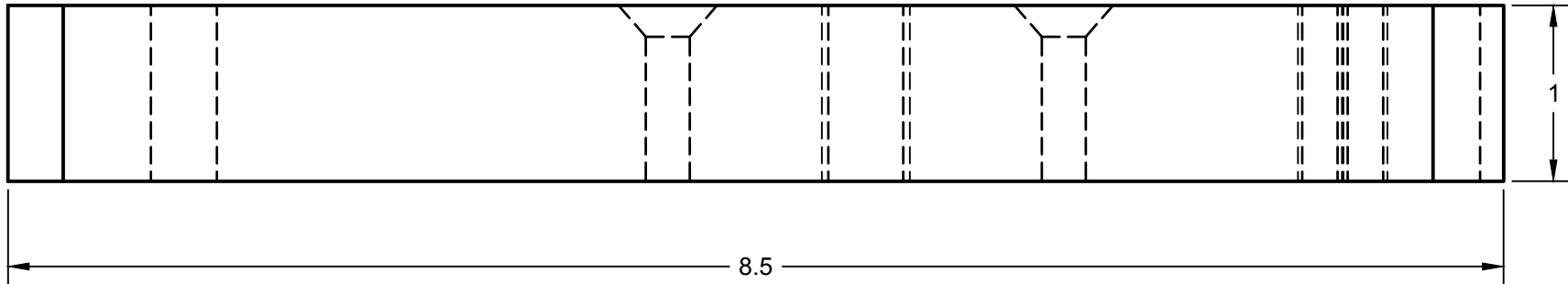
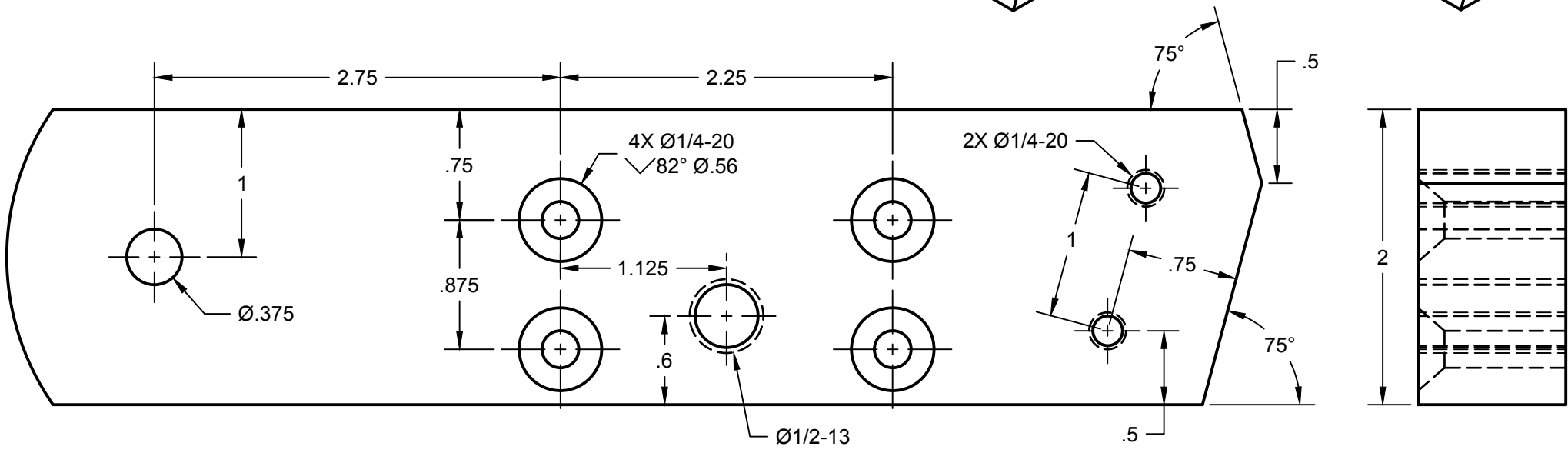
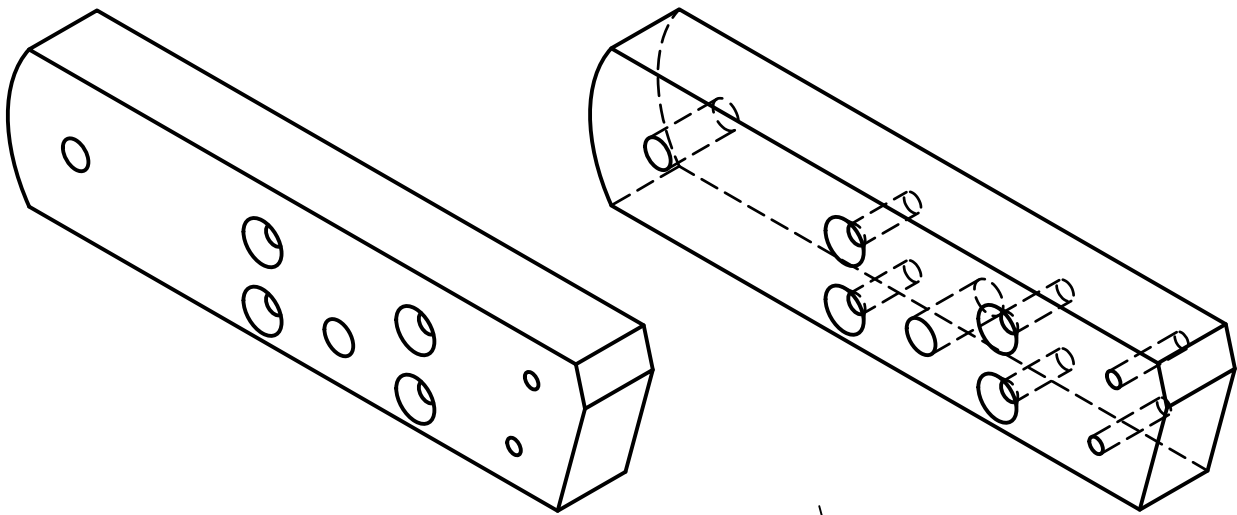
1/2 X 2.5 X 8.5 Aluminum

Page 8 of 12



TENSION & TRACKING ARM

1:1  
1 X 2 X 8.5 Aluminum  
Page 9 of 12

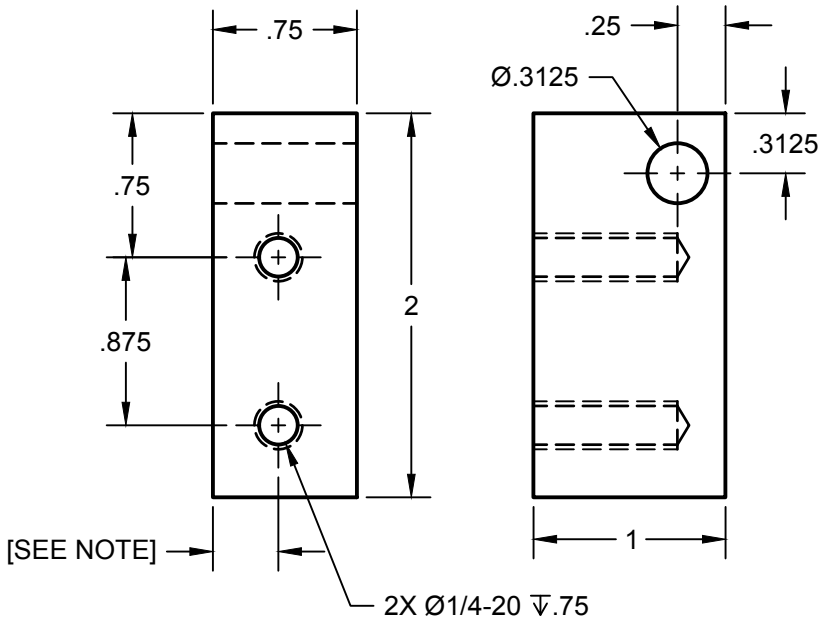
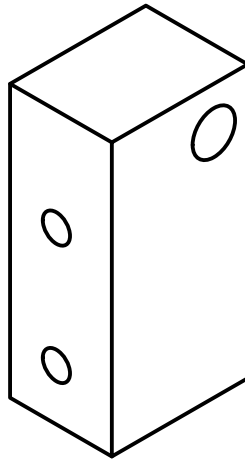


# TRACKING PIVOTS

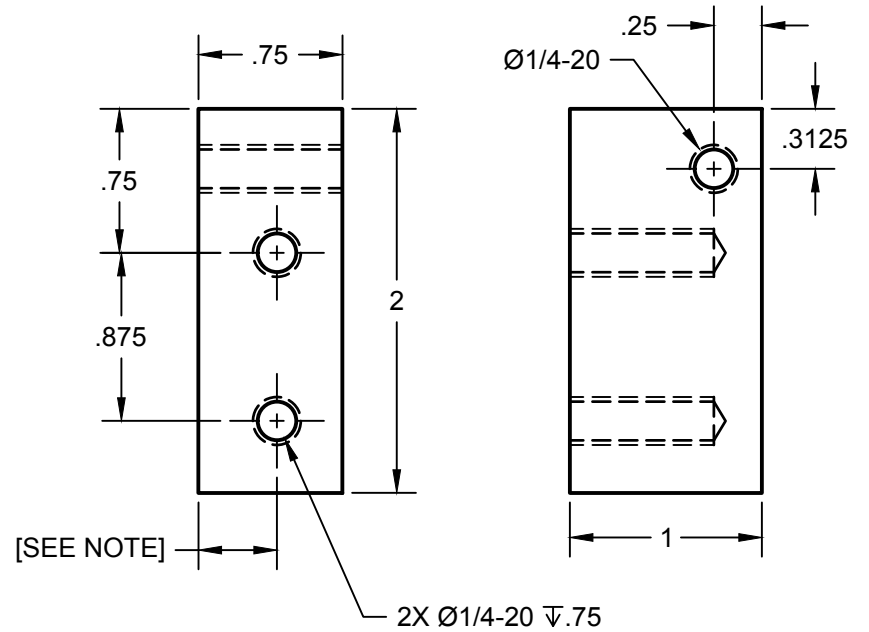
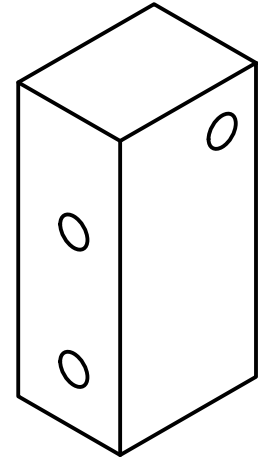
1:1

Page 10 of 12

### FRONT PIVOT 3/4 X 1 X 2 Aluminum



### REAR PIVOT 3/4 X 1 X 2 Aluminum



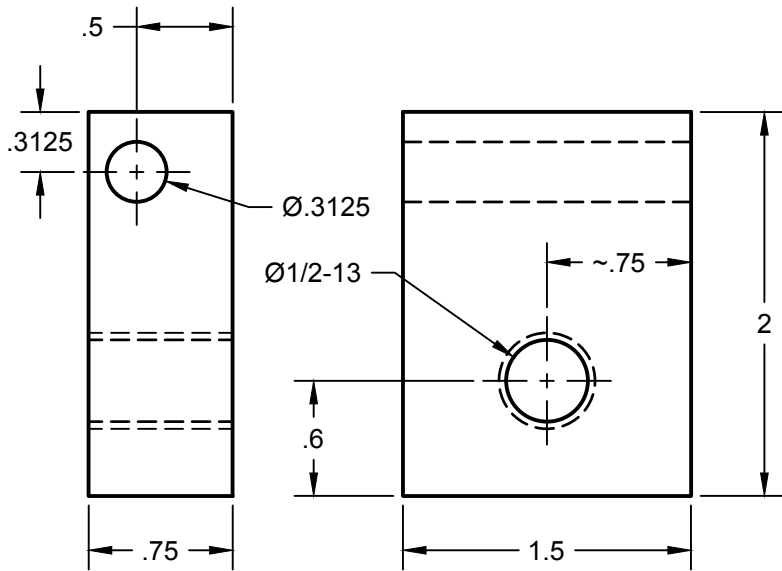
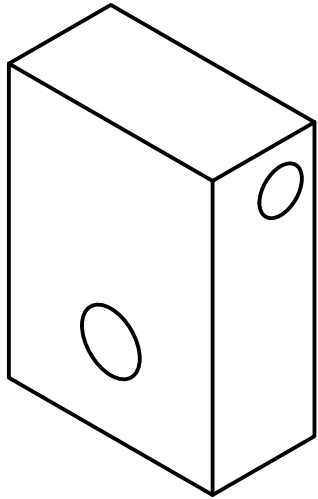
NOTE: Assemble TRACKING PIVOTS, TRACKING TAB, washers with shoulder bolt, then transfer hole locations from TENSION ARM to account for washer thickness.

# TRACKING WHEEL TAB

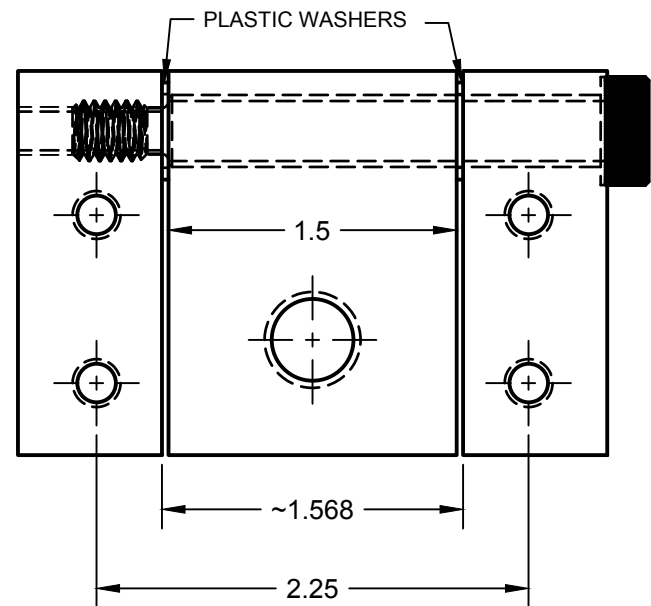
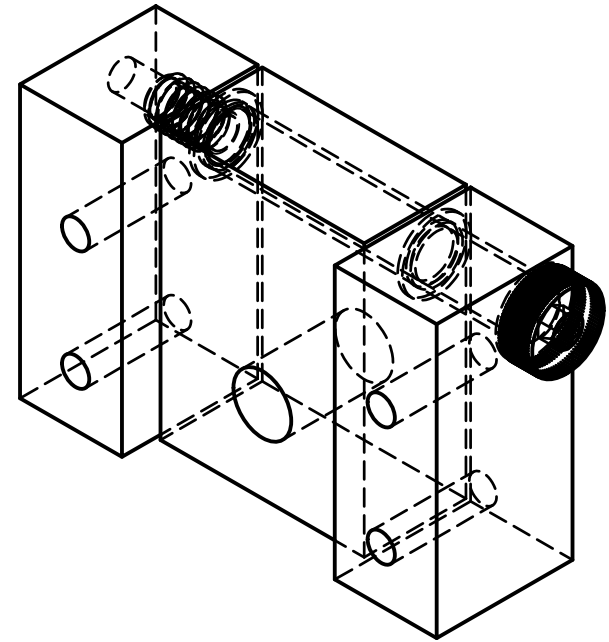
1:1

3/4 X 1.5 X 2 Aluminum

Page 11 of 12



# TRACKING COMPONENTS ASSEMBLED

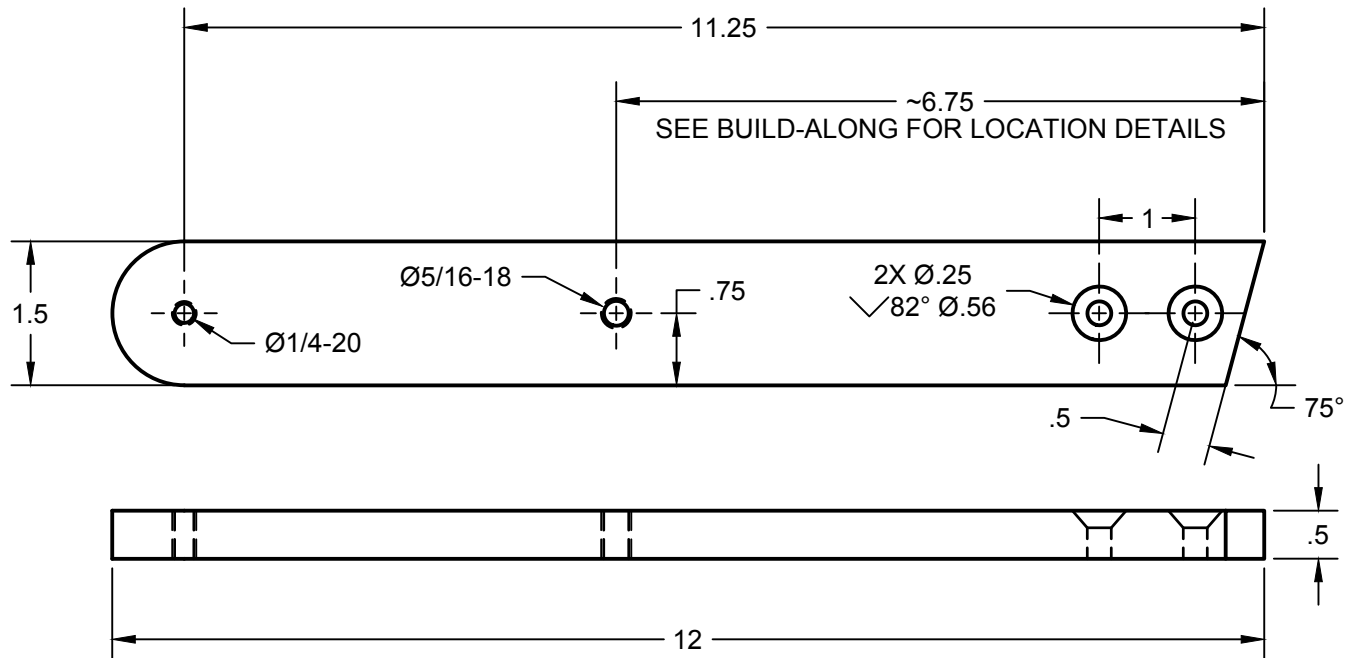
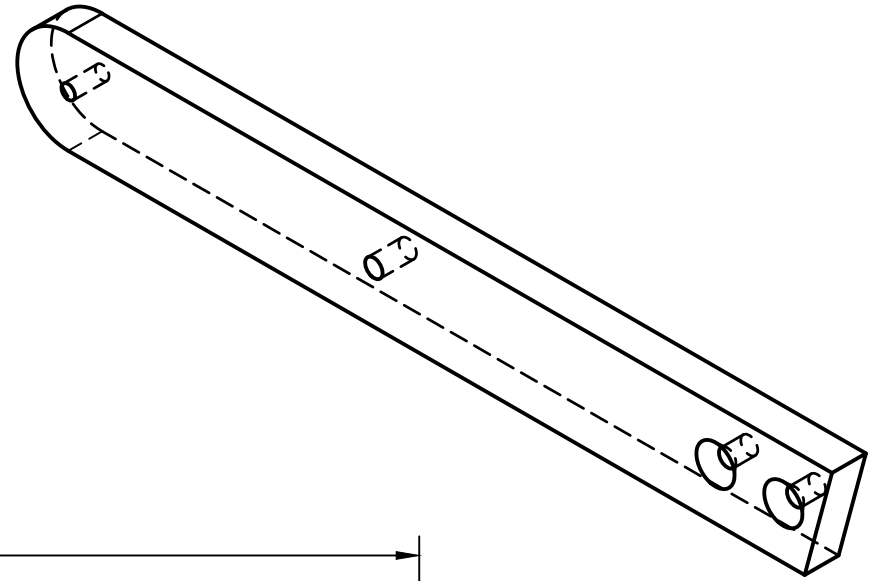


# TENSION HANDLE ARM

1:2

1/2 X 1.5 X 12 Aluminum

Page 12 of 12



# LEFT SIDE AND SPACERS

Front View

1:1

Transfer holes from side plate to spacers, using tool bar with temporary tape shims to ensure clearance for tool bar movement. See instructions for details.

