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Process Machining of Specific Industry Components

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Abstract

Machining is an essential process in the manufacturing of almost any modern equipment as either a primary or secondary process. Many simple and complex equipment and systems in the automotive, military, aerospace and medical industries are produced by process machining. Other common applications such as injection molded plastic products are produced by machining as a secondary operation. It is very difficult to name any modern product that is not made using machining. The objectives of our Major Qualifying Project (MQP) are to understand, interpret and perform process machining. We achieve these objectives by machining a class of specific industrial components in WPI Washburn and Higgins Laboratories. The components are integral part of the steel mills production of a local company in Worcester. The working engineering graphics, dimensions and materials of the components are provided by the company. The company hired the entire MQP team as summer interns. During this working experience at the Company, we were able to learn about what was expected from our MQP work. We also learned about the manufacturing practices of the Company, and the companies that they do business with.

By the end of the MQP we have gone through several iterations of the process machining that is described throughout this report. We utilized Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM) software to create three dimensional digital models of the two dimensional drawings we received. From the company. Finally, we utilized both manual and Computer Numeric Controlled (CNC) machine tools to machine the components in WPI Washburn and Higgins Machine-tool laboratories.

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Acknowledgements

We would like to thank Professor Mustafa Fofana for his guidance and expertise in both the process machining project and our professional development. We would also like to extend our gratitude to Neil Whitehouse for his assistance in the Higgins machine shop. In addition we would like to thank a local industrial company in Worcester particularly James Laliberte, Michael Kasik, Robert Shilinsky, Stephen Handy, and Edmund Kenny.

Chapter 1: The Expansion of Process Machining

Machining plays a critical role in the production of almost any product encountered in day to day living. From large scale aerospace applications to kitchen utensils, process machining plays a significant role. The heart of successful machining is the understanding of how to design and dimension a component for machinability while attaining the intended functionality. The shape, size, and tolerance of the component help define the raw stock, fixture, cutting tools, machine tools, and cutting conditions, Engineers and technical machine shop specialists, engaged with process machining must be able to read and translate component working drawing graphics (CWDG). The CWDG contains the information that is necessary to carry out process machining at single or multiple quantities. The engineers and technical machine shop specialists use the CWDG to program and operate the machines, equipment, and tools required to realize this design.

In this process machining MQP, our goal is to go through several iterations of the design, manufacturing, and realization process through the eyes of a manufacturing engineer as well as a manufacturing technician. Using a variety of commercial drawings we are able to interpret two dimensional engineering drawings and recreate the parts into a three dimensional model using Solidworks. From there we are able to design a manufacturing process that can be utilized to create the part on a CNC machine. Once this process has been defined, we use various machine tools to create the components. After the parts are created we inspect them to ensure that they meet the specifications on the drawing. In several cases an iterative design process is required to achieve the desired results.

Completing the manufacturing process makes us more complete and competent engineers. We have experience in the procedures that occur in the manufacturing design and processing of machined parts. We are working to apply the experienced gained from working at a large manufacturing company in Worcester into our project. Using the manufacturing resources on WPI's campus we are able to model and machine commercial quality components. Solid modeling and CNC programming are completed in the Solidworks and Espirit software respectively. Realization of these components is accomplished by using both the manual and CNC machine tools in the machine shop at Higgins Laboratory.

In the next five chapters of this report process machining is reviewed as a whole and then more specifically in the context of our experiences. First the relevance of machining in modern industry is discussed. This is followed by a discussion of the uses of CAD and CAM software with an emphasis on our experiences with a component called a seal retainer. After discussing the software used in the manufacturing process we move on to review individual industrial components we have created. These begin as simpler components created on manual machine tools and progress to complicated CNC milled parts. We have increased our comprehension and execution of process machining greatly over the course of the MQP. In the future, we will continue to utilize this experience in both further coursework and our professional lives.

Chapter 2: The Significance of Process Machining in Industry

2 Introduction

Process Machining is the steps taken to remove material from a given piece of raw material or stock. This is done in-order to create a desired component or product. There are four main machining processes; they are milling, drilling, turning and grinding. These processes each have a specific function of use and are used on various parts depending on the specifications of each part. Therefore varying industries will have different processes and / or the same processes will be carried out in a different manner in accordance with the specifications.

Milling and drilling are a fairly similar process. These operations both require the work piece to be held firmly in place without moving while the mill or drill is in motion. However, they should not be used as interchangeable processes. This means that although it is possible to use a milling operation to satisfy a drilling specification it should not be done. The same can be said when using a drilling operation. Drilling operations are designed to have the tool drive down into the work piece while milling operations are designed not to do so but to contour a part.

Turning and grinding are not as similar as milling and drilling; in-fact they are very different. Turning involves the rotation of the work piece while the tool is held still. This process removes much material in a single pass. Grinding is a finishing operation. This is done after a part has been almost completely machined with little material left to be removed. The significance of this is giving the part a better look and finish.

2.1 Process Machining in Aerospace Industry

The largest factor to be taken into consideration when talking about the Process Machining of Aerospace Industry is the strength of the material being used. The strength of the desired material affects not only the process to go about machining the desired component but also the tools used and their different rates of operation. Typically the rpm at which a tool operates for harder materials is low. This along with the application of coolant reduces the temperature which allows for the material to be cut with more ease.[3]

2.2 Process Machining in Automobile Industry

The automobile industry heavily relies on the continuous movement of stock and product. Today's society demands results immediately. Therefore in this industry if one cannot produce results as demanded they will not last. The automotive industry is required to mass-produce product at a high rate to eliminate the wasted time and please the consumer. This industry utilizes machines working on an assembly line to efficiently produce a large number of products. This means that the overall process must be synchronized so that the numbers of parts correctly correspond to the number of products in a timely fashion.[1]

2.3 Process Machining in Medical Industry

The components made in the medical industry are very specific, depending on the part. Therefore the tolerances of these parts are very, very small. This means that the process of machining must be absolutely perfect as the components made are used on a daily basis by either being implanted into people or saving their lives. This affects everything used in the process such as the offset of the tool used as it must be accurate down to the .0001 of an inch.[2]

2.4 Lean Manufacturing as applied to Process Machining

Lean manufacturing is the least amount of waste. This waste can take multiple forms as wasted time, money, etc.. The machining process can take multiple steps for the creation of just a single part. This means that time is wasted in transferring the part from machine to machine and the process is not lean. Lean manufacturing is how industries make their money by creating components and overall parts in the quickest manner possible.

Chapter 3: Component CAD/CAM

3 Introduction

The first component we are working with is a seal retainer from a local company. The seal retainer is a critical part in many of the company's steel roll milling assemblies. It has an O-ring on the outer diameter that maintains an oil seal. The bore must be very tightly toleranced and the thickness of the part is critical to the alignment of the rollers. If this component is not machined accurately, the rollers will not line up correctly and the steel rod will not be rolled to the correct geometry.

Our task with the seal retainer is to develop a machining process that could create the finished part from the cast blank. In addition to developing the process we originally hoped to create some parts to prove our manufacturing processes. The seal retainer casting and finished drawings can be seen in Appendix A – Engineering Drawings. Figure 1, shows the solid model of this component that is created in Solidworks.

Figure 1 Seal Retainer Solid Model

3.1 Seal Retainer Casting

The first step in the manufacturing process is to create a solid model of the seal retainer casting from which the final part is made. In order to model the seal retainer in SolidWorks the part is divided into three different layers; the top, middle, and bottom. The top and bottom layers are very similar, while the middle layer is more intricate. After the layers are created, the hole wizard is used to put four 7mm through holes in the locations shown in Figure 2. To reference the geometry of the part and its layers see Appendix A – Engineering Drawings.

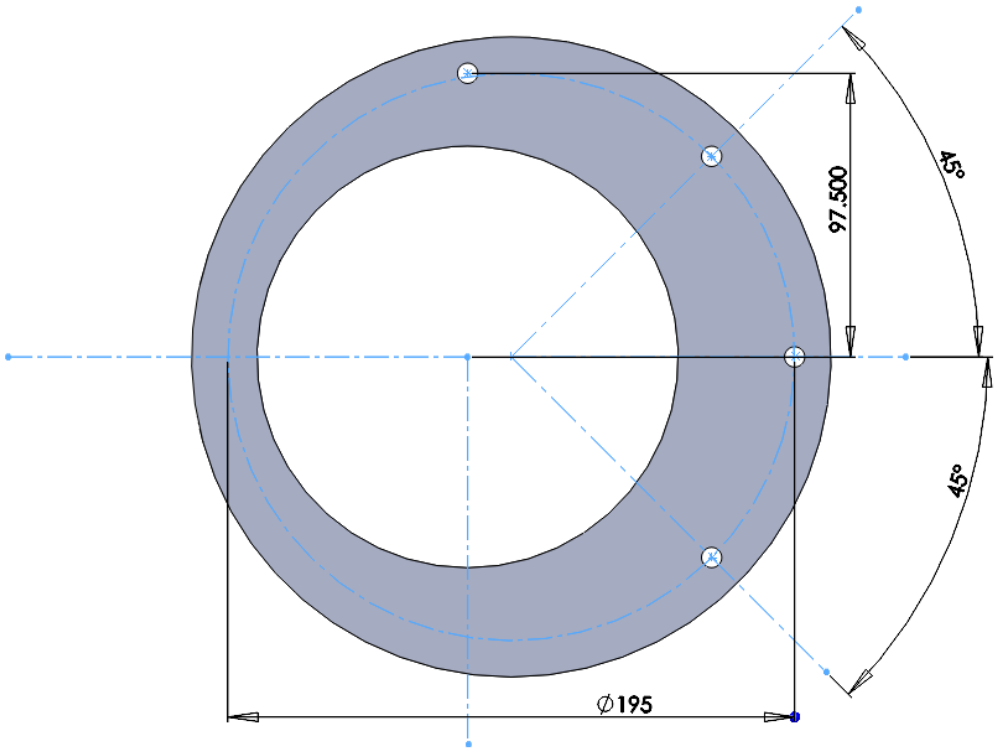

Figure 2 Seal Retainer Casting Hole Locations

3.2 Seal Retainer Finished Machined

The finished machined version of the seal retainer is also modeled in SolidWorks using three different layers; the top, the middle and the bottom. The middle layer geometry is shown in Figure 3. The top and bottom layer consists of two circles with different diameters and offset origins.

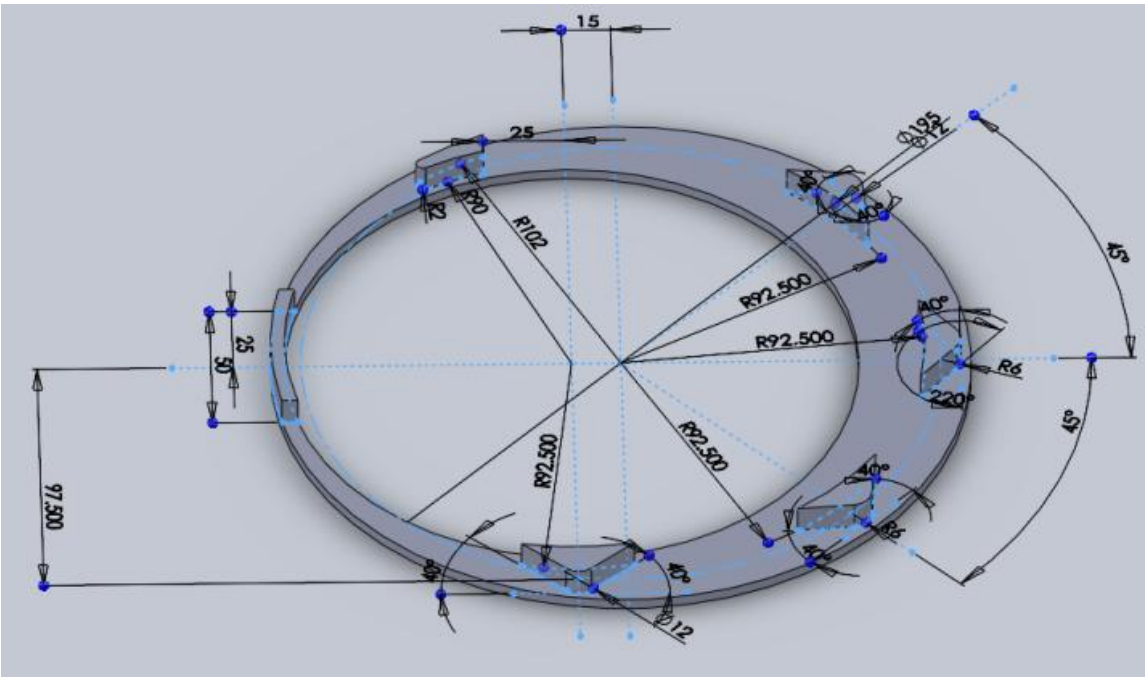

Figure 3 Seal Retainer Middle Layer Geometry

After the basic geometry is established the four 7mm through holes are created using the hole wizard feature. These holes are in the same location as the rough casting holes shown in Figure 2. Two M6 holes through the top layer are then created using the hole wizard feature. Counter bores around the M6 holes and 12.7mm reamed hole are also created using the hole wizard feature. The O-Ring groove is created using a revolved extrude cut. The O-Ring groove can be seen in Figure 4 and Figure 5. The fully dimensioned hole locations can be found in the seal retainer drawings in Appendix A – Engineering Drawings. Figure 4, Shows the top of the final part from an isometric view.

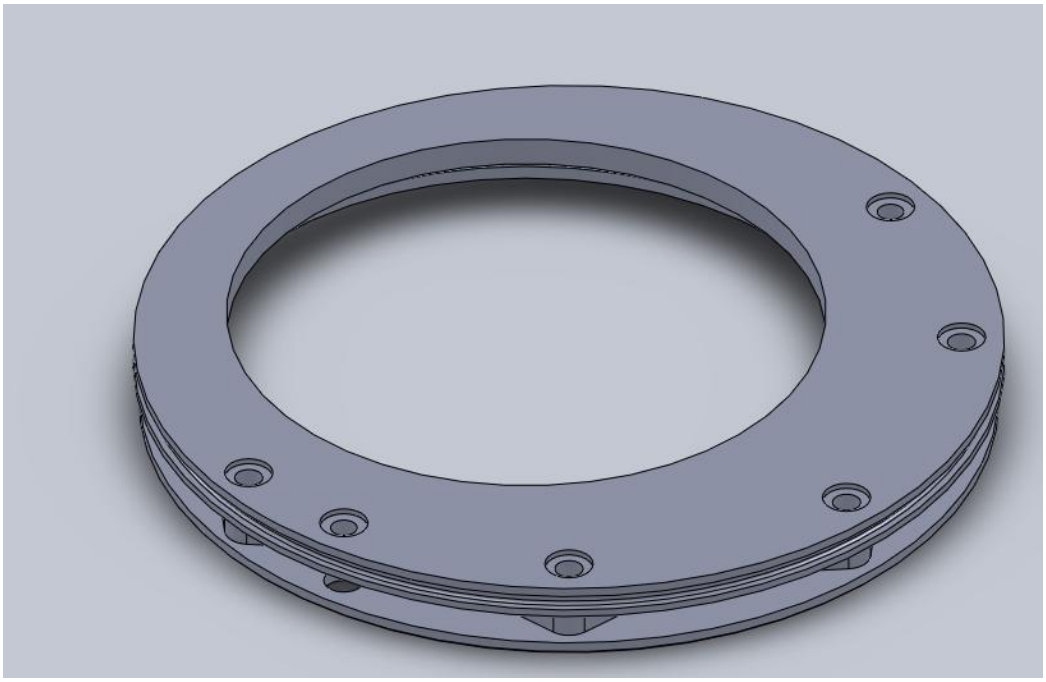

Figure 4 Seal Retainer Part Top

In Figure 5, the bottom of the final part is shown in an isometric view. For full part geometry, reference the drawings in Appendix A – Engineering Drawings

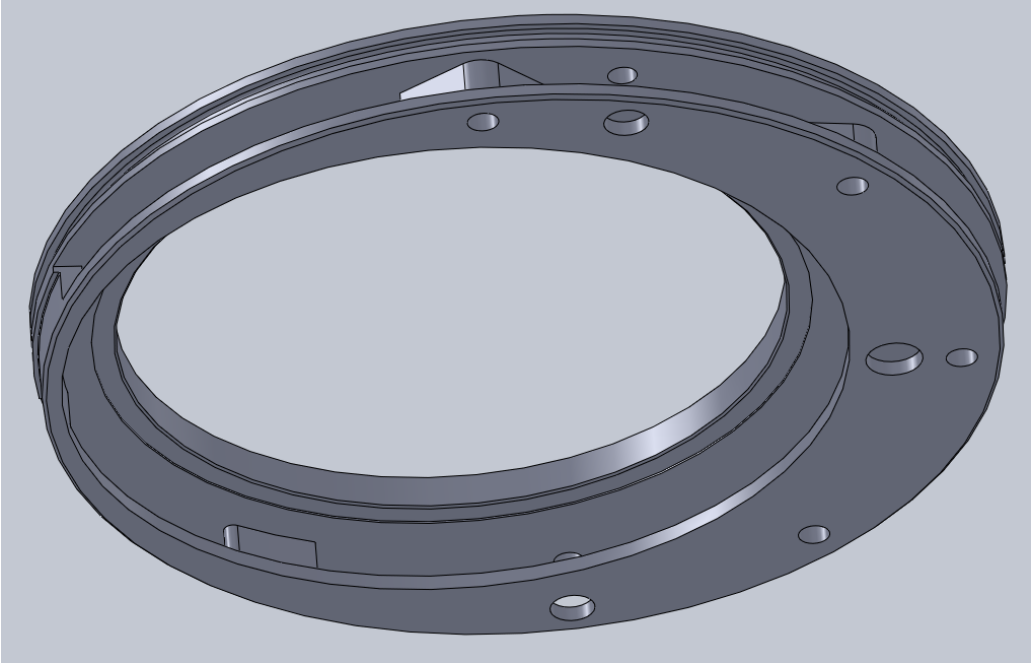

Figure 5 Seal Retainer Bottom

The Solidworks CAD software is a very powerful engineering tool. It has a very straightforward interface that allows even novice users the ability to create complex geometries. Once parts have been created they can be linked to drawings and assemblies can be created from multiple components. Solidworks and other CAD software are essential tools for the contemporary engineer.

3.3 Milling CAM for Seal Retainer

A simplified milling procedure is described between Figure 7 and Figure 8 that could be used to create some of the features of the top of the seal retainer. This procedure is still in the developing stages and does not consider the fixtures that will likely have to be developed to make the machining of this part feasible. In addition, feeds and speeds have not been calculated yet because the tooling to be used in making this part has not been determined yet.

The project manager from the Esprit CAM software in Figure 6 contains some of the elements that helped to create the NC program. It describes all of the relevant geometric features of the part and the machining operations associated with them. Note that these machining operation are not listed in the order they occur in this view.

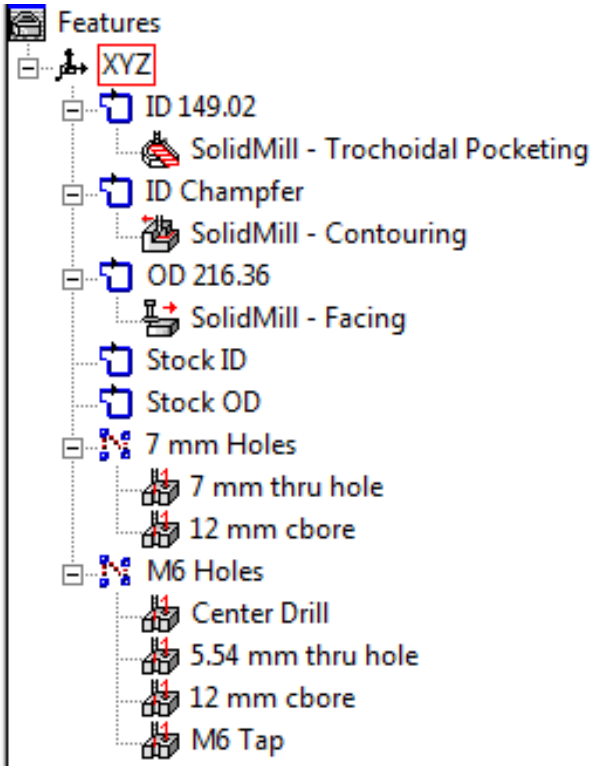

Figure 6 Espirit Project Manager

Figure 7, shows the machining tool paths along with a solid model of the casting stock. In this view, the facing operation used to bring the top surface to the correct thickness and the pocketing operation used to finish the bore can be seen.

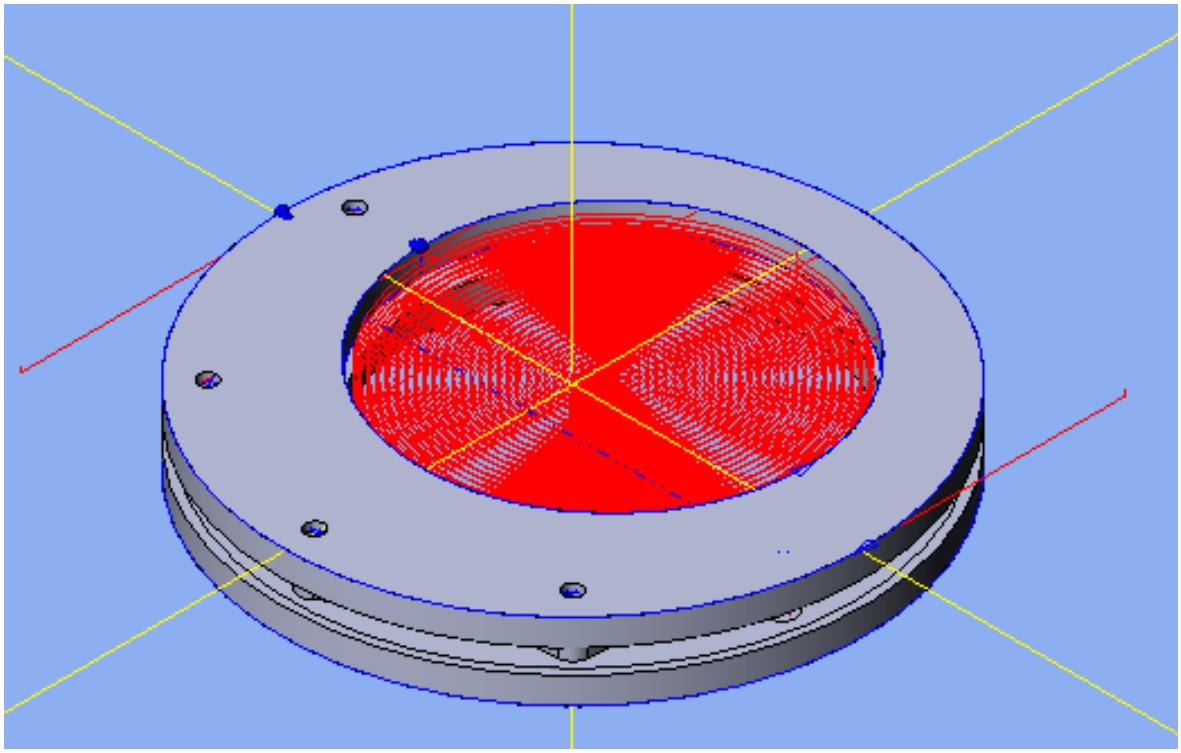

Figure 7 Seal Retainer Stock Casting with Tool Paths

Figure 8 depicts the finished part with the machining tool paths. This does not include the pocketing operation which is depicted in Figure 7.

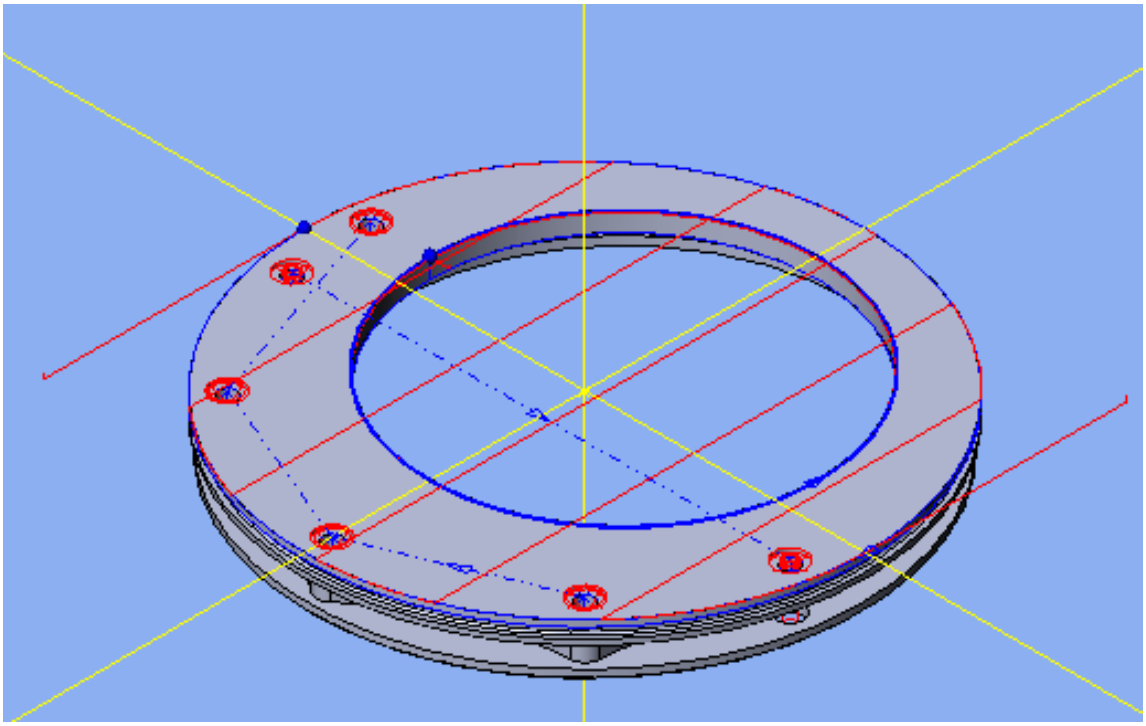

Figure 8 Seal Retainer Finished with Tool Paths

The first operation to be completed is a facing operation that decreases the thickness of the top layer from its cast thickness of 10 mm to its finished thickness of 8.5 mm, as seen in Figure 9. This operation uses a facing mill and can be completed in one or two passes.

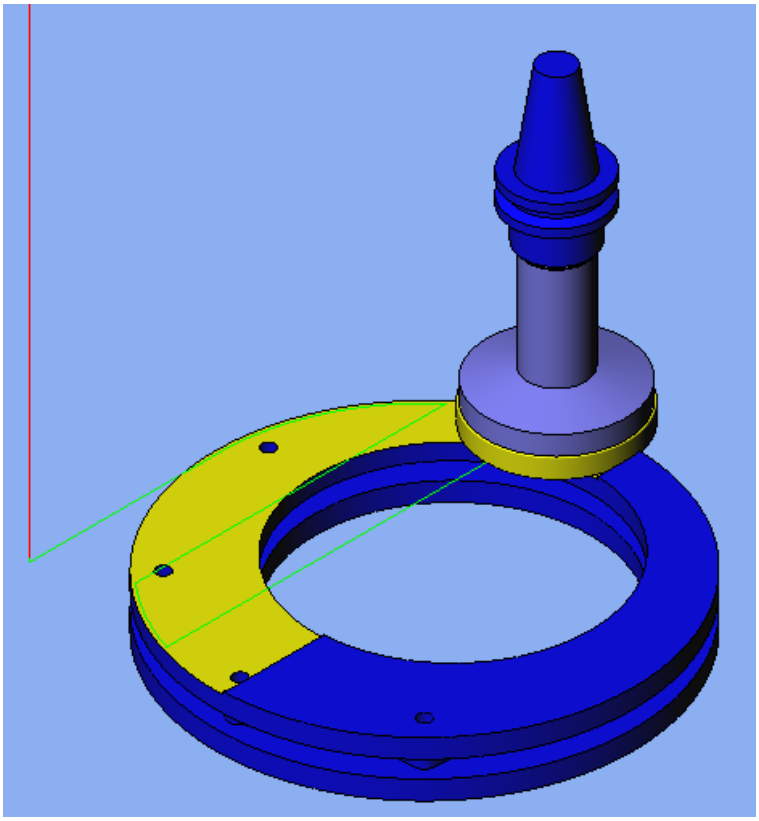

Figure 9 Seal Retainer Simulation of Facing Operation

Figure 10 shows a screenshot of a simulation of the drilling of the four 7 mm holes. This drilling operation uses a pecking strategy to incrementally increase the hole depth. Moving the drill in and out of the hole allows the metal chips that have been created to evacuate the hole which leads to a more efficient and cleaner drilling operation. In addition to the 7 mm holes there is also a 1.5 mm deep 12mm counter bore. The machining of the counter bore is not specifically depicted in this report.

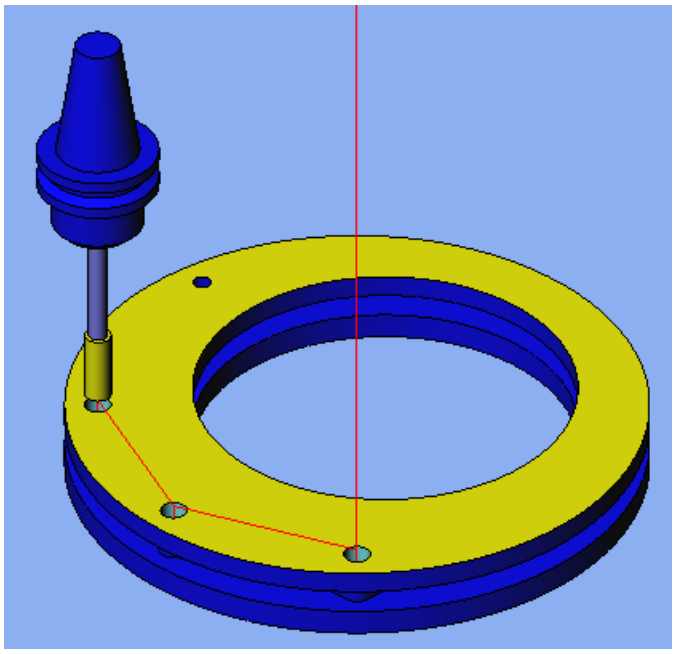

Figure 10 Seal Retainer Drilling of 7 mm Hole

Figure 11, shows the drilling of the two M6 holes. The first step in creating this feature is using a center drill to create a spot hole (not pictured). Using a center drill increases the accuracy of the hole location. Next, a 5.54 mm hole is drilled through the entire top layer of the part. After a quick look up in a machinist handbook, this diameter is selected for the appropriate hole diameter before tapping for an M6 hole. The hole is created using a pecking strategy for incremental removal of material. After the 5.54 mm hole is completed, a 12 mm counter bore, 1.5 mm in depth, is created. The final step in completing this feature is to use an M6 tap to create the threads.

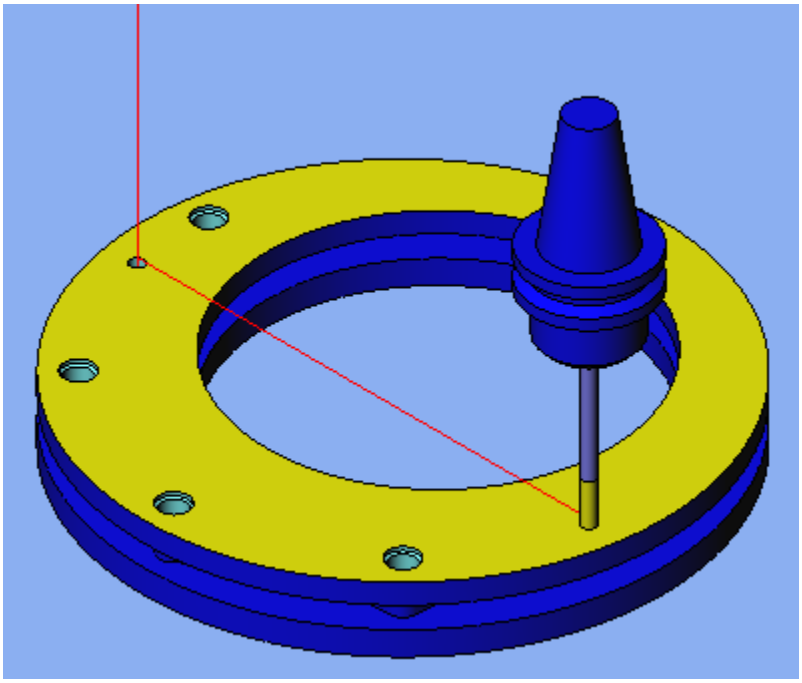

Figure 11 Seal Retainer Drilling the M6 Holes

The final operation (although it could have occurred anytime after the facing operation) is to pocket the inner diameter (ID) of the top layer. In the simulation shown in Figure 12, a 10mm end mill is used with a trochoidal pocketing strategy. The selected entry mode is a plunge at coordinates (0,0) and the selected incremental depth of cut is 2.5 mm. This operation has not been optimized as the majority of the operation is spent machining air. In further iterations of the design process this must be corrected to have the machine tool rapid to a location closer to the cutting surface.

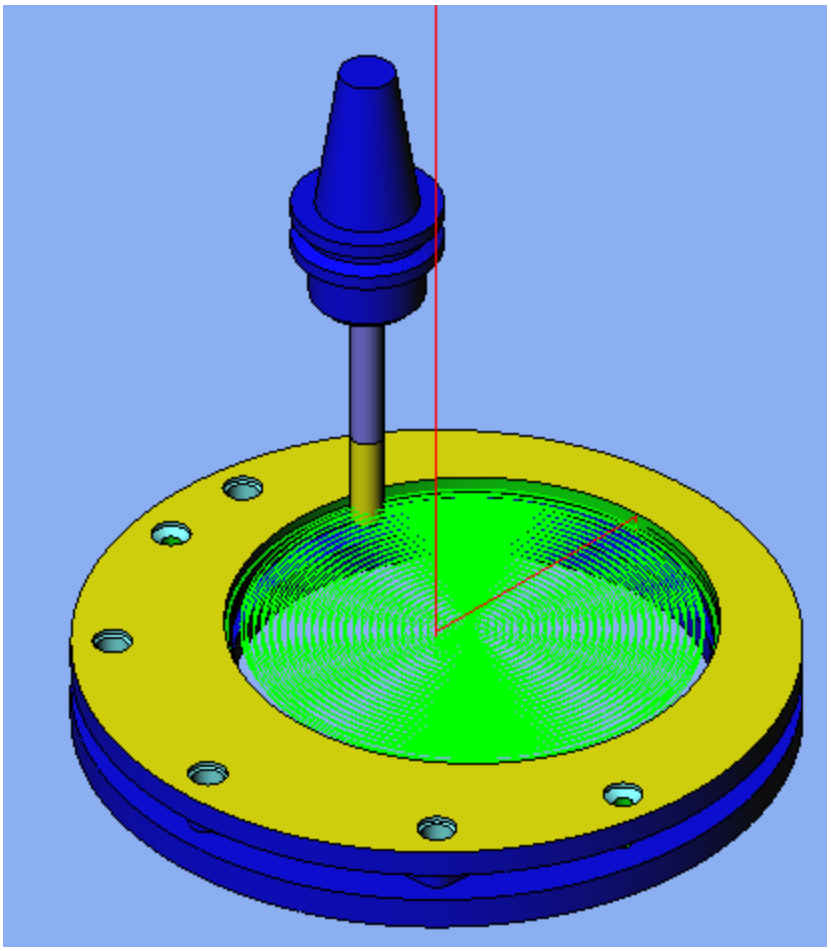

Figure 12 Seal Retainer Pocketing the ID-+

CAM software is a very powerful engineering tool that enables manufacturing engineers to write CNC machining programs based off of the geometry created in solid models. In addition to linking the machining and drawing together digitally, the software allows the programmer to simulate the machining operation. Simulation helps eliminate errors that are costly in both time and material.

3.4 Results and Discussion

The seal retainer is a very difficult part to manufacture. There are several dimensions that are very tightly toleranced. In addition, the thin upper layer of the part must remain flat which necessitates small depth of cuts and large machining times. To create this part effectively, special fixturing would need to be created to hold the part and create the features precisely and repeatedly. Although we have created some of the NC code that could be used to create this part from a casting, WPI's machining facilities do not contain a lathe large enough to safely create the seal retainer. Thus, our study of this part is limited to the theoretical, although it is a good example of some of the many difficulties that arise in commercial and industrial machining.

Chapter 4: Specific Components Machining

4 Introduction

Chapter 4 contains descriptions of our iterations through the manufacturing design and realization process. We create mounting brackets, a connecting link, a connecting link fixture, manifold, and a flange through process machining. These parts are created through manual machining and/or CNC machining. After creating the parts we analyze them to determine if they meet the requirements specified on the drawings. Once this analysis is completed another iteration of the process machining process can begin to improve the part further or increase the efficiency of the process used to create the part. Eventually, once the process is efficiently and consistently producing good parts, production runs can begin.

4.1 Mounting Bracket

The mounting bracket is the first part we machined using manual machine tools. From the engineering drawing it can be seen that the part is to be made of steel. However, to prevent costly mistakes, the part is to be machined out of aluminum. Aluminum is a soft metal to machine and the chances of damaging the tooling is significantly reduced. After the aluminum piece is completed it is determined that the group is ready to manually machine the part out of a more correct material. We chose to use a mild steel to create the second mounting bracket. To see the drawing, which is obtained from a commercial machine shop, see Appendix A – Engineering Drawings.

The mounting bracket has two dimensions that have fairly tight tolerances. The first is the 1.000” dimension between holes. Applying the document tolerance limits to the dimension

give an allowable distance of .995 to 1.005 inches. This dimension applies for both the 11/32 thru holes and the 5/16 – 18 tapped holes. The only other tight dimension on the drawing is the .320" counterbore depth. Applying the document tolerance limits gives an allowable depth of .315 to .325 inches. Although the holes diameters were given to three decimal places, they corresponded to common fractional drill sizes so they were assumed to be non-critical. In a production setting this would be verified with the company before production. The dimensional tolerances given on the drawing (Appendix A – Engineering Drawings) are rewritten more legibly in Table 1. All units in this table are in inches.

Table 1 - Tolerance Block for Mounting Bracket

x.x	± .1
x.xx	± .05
x.xxx	± .005

The tolerance block applies to all dimensions given in the drawing that do not have a specified upper and lower tolerance limit.

4.1.1 CWDG of the Mounting Bracket

Using Solidworks we have created a three dimensional solid model of the mounting bracket from the two dimensional drawing. An image of the solid model of this part is shown in Figure 13.

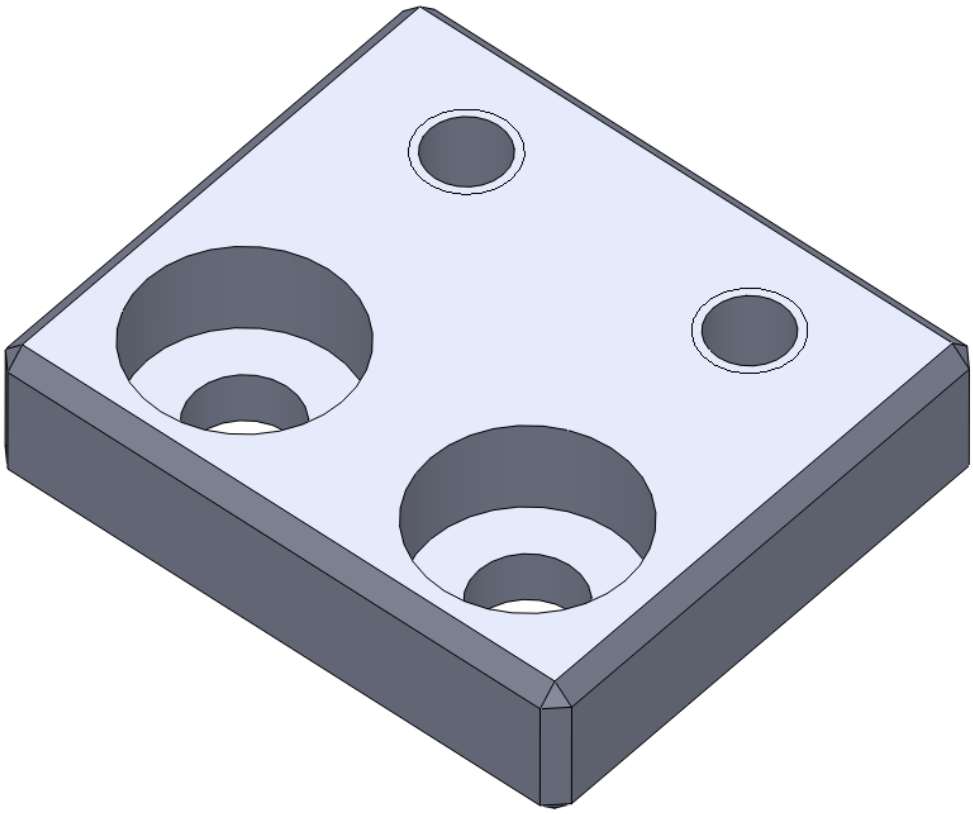

Figure 13 Mounting Bracket Solid Model

This solid model shows all of the critical features of the part as well as the relative size. The model does not give any indication of the absolute size of the part and the threads of tapped holes are not shown.

4.1.2 Design for Machining

Since the parts are created on a manual milling machine and surface grinder, there is a significant amount of variability introduced by the operator. Unlike a CNC machined part, the process variables (feeds, speeds, depth of cut) cannot be as precisely controlled and replicated. Instead these parameters are varied by the operator to account for the specific tooling, material, and machine used in order to create a good part.

There are some general trends in the feeds and speeds used to machine these parts. In general, the spindle speed varies according to the diameter of the tool being used. Because of the difference in surface velocity for the same rotational velocity created by using tool of different radii, larger tools are generally used at slow spindle speeds than tools with smaller diameters. For instance, creating center holes at higher spindle speeds (~ 500 RPM) than the 11/32 holes (~200 RPM). The feeds are varied by the operator in accordance with how the machine feels, sounds, and the resulting material finish. Since this feed is controlled simply by rotating the handles, there is not a good quantitative way to keep track of the feed rate.

The depth of cut we use varies with the material type and the given operation. In both the aluminum and the steel we are conservative on the depths of cut using about .050" and .030" respectively for facing operations. Although much deeper cuts can be made, it enables us to feed quickly without fear of breaking the tools or stalling the machine. In drilling the holes, we generally use a pecking strategy with the peck increments determined by feel by the operator. The exceptions to the pecking strategy are the center holes and the counter bore both of which are just drilled straight through to their desired depth.

This part does not require complicated setups. For almost all milling operations the part is simply placed in the vice on top of parallels and the work coordinates are established using an edge finder. Work stops are used for the chamfering operation so that all 12 edges could be machined by touching off only three times. When grinding the small sides of the block an angle block and a c-clamp are used. To ensure that the part sits flat in all of the setups, the part is deburred using a file between operations.

The machines are not equipped with coolant so none is used in these machining operations. However, a cutting gel is used for most milling and drilling operations. The purpose of this cutting gel is to reduce tool wear and to improve the surface finish of the part.

4.1.3 Manual Machining

The powered machinery used to create this part consists of a band saw, milling machine, and surface grinder. The band saw is used to cut the stock into manageable pieces. The milling machine is used to create all of the parts' features and rough out the overall dimensions. The surface grinder is used to bring the part to its overall finish dimensions and to create a good surface finish. The tooling that is used in the creation of the mounting bracket is listed in Table 2.

Table 2- Tooling Used To Create Mounting Block

5/16 – 18 tap
“F” drill
11/32 drill
11/16 drill
11/16 end mill (11/16 counterbore with 11/32 pilot preferred)
2.5” facing mill
center drill
½ end mill
3/8 45 end mill countersink
File
Deburring tool

The first step in creating the mounting bracket is to obtain stock and rough machine it down to size. For the aluminum part the stock is cut to around 1/8” oversized on the band saw. The steel component is created from a piece of scrap stock that is small enough to not require cutting. Next the stock is milled down to size using a combination of a 2.5” facing mill and a ½” end mill. Parallels and a square are used to ensure that all six sides are square to one another. Since the overall dimensions are not tightly toleranced, the roughed dimensions are left on the high end of the tolerance to allow for additional material removal to fix any mistakes that could occur.

After the rough machining is completed we layout the features on the top of the part utilizing a dry erase board marker and a pair of calipers. Next the part is loaded into a vice on top of parallels, leaving about half the thickness of the work piece above the top of the vice. Using a .2" edge finder, the near left side corner of the part is set as the machine zero in the coordinate tracker. To verify the accuracy of the coordinates the four holes are each spotted with a center drill to make sure that the spot locations aligned with the layout marks. After the part setup is confirmed, center holes are drilled for each of the four holes. Next an "F" drill is used to create the minor diameter of the two 5/16 – 18 threaded holes. After that an 11/32" drill is used to create the two through non tapped holes. To create the counter bore an 11/16" end mill is used. Ideally, an 11/16" counter bore with an 11/32" pilot would be used, but due to limited tooling availability, an end mill had to be used. To break the sharp edges on the holes and put a lead onto the threaded hole, a standard countersink is used to put a small chamfer both ends of all four holes.

The next step in creating the mounting bracket is to tap the two 5/16 – 18 holes. We are able to do this manually using a tap wrench and some tapping lubricant. However, the tap we used is dull or otherwise defective and did not cut well. As a result we had to chase the thread a couple of times before a 5/16 - 18 bolt would run smoothly through the thread. Another effect of the bad tap is a mound of material that formed around both the top and bottom of the threaded holes. In our first piece we removed the excess material brought up by the tap with a file. However, this significantly damaged the finish of the aluminum part. To avoid a bad finish with the steel part we first file off the excess material on one side and then put the part of the surface grinder to remove the excess material from the other side. Then we

flip the part over again to gain a good finish on the side that had been initially filed. To ensure that the edges of the part had an equally good finish we also ground them on the surface grinder. To do this we used a 90 degree block and a c-clamp to secure the part to the table. To avoid damaging the part with the c-clamp, a piece of yellow metal is used as a buffer. The final operation is to create the .060" chamfer on all 12 edges of the piece. This is done using an end mill with a 45 degree tip angle.

4.1.4 Results and Discussion

The two completed mounting brackets are shown in Figure 14 and Figure 15.

Figure 14 Aluminum Mounting Bracket

Figure 15 Steel Mounting Bracket

In both the aluminum and the steel mounting blocks we were able to achieve dimensionally accurate parts. The aluminum part does not meet the specifications called for on the drawing because the part is supposed to be made out of steel. In addition the filing required to remove the deformities created in taping resulted in a bad surface finish on the large faces. Furthermore, the chamfering operation resulted in a very poor surface finish that would probably not affect the performance of the part but nonetheless downgrades the quality of the part. All threaded holes were checked with a 5/16 – 18 bolt and the threads were chased with the tap until the bolt ran through the hole smoothly.

The parts are measured by calipers during and after production. Although micrometers would have been ideal, the calipers have sufficient accuracy and resolution (.001”) for this part.

For simplicity in reporting, a drawing is created for this component with the dimensions replaced with reference variables. The drawing is shown in Figure 16. Table 3 and Table 4 display the measured values for each of these dimensions along with the nominal dimension and tolerance limits. All dimensions in these tables are in inches.

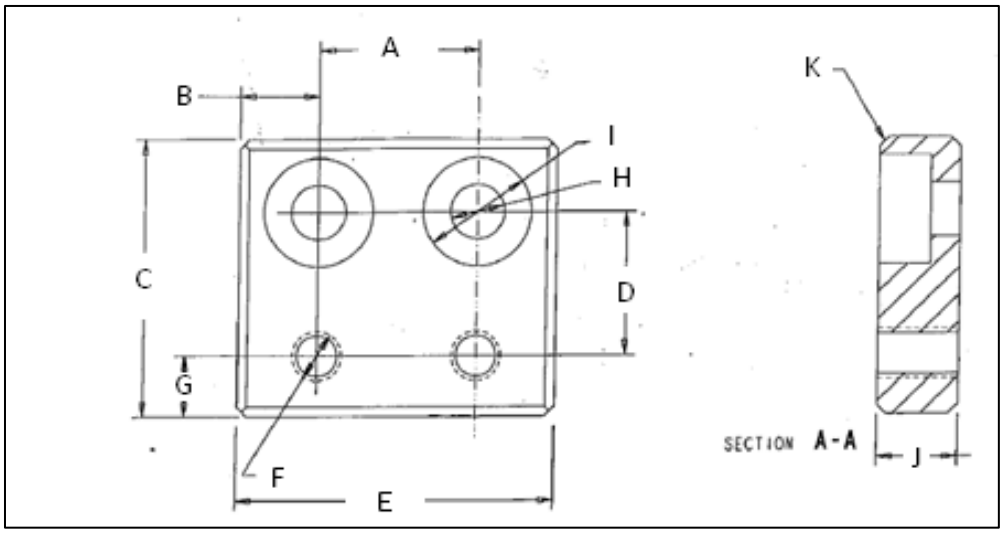

Figure 16 Mounting Bracket Drawing for Measurement

Table 3 - Aluminum Mounting Bracket Measurement

Dimension	A Tapped	A Thru	B Tapped	B Thru	C	D	E
Nominal	1.000	1.000	0.50	0.50	1.75	0.91	2.00
Tolerance min	0.995	0.995	0.45	0.45	1.70	0.86	1.95
Tolerance max	1.005	1.005	0.55	0.55	1.80	0.96	2.05
Actual	1.002	1.001	0.497	0.499	1.749	0.917	1.994
Dimension	F Minor Dia	G	H Dia	I Dia	I Depth	J	
Nominal	-	0.38	0.344	0.687	0.320	0.50	
Tolerance min	-	0.33	-	-	0.315	0.45	
Tolerance max	-	0.43	-	-	0.325	0.55	
Actual	0.287	0.379	0.350	0.703	0.316	0.510	

Table 4 - Steel Mounting Bracket Dimensional Analysis

Dimension	A Tapped	A Thru	B Tapped	B Thru	C	D	E
Nominal	1.000	1.000	0.50	0.50	1.75	0.91	2.00
Tolerance min	0.995	0.995	0.45	0.45	1.70	0.86	1.95
Tolerance max	1.005	1.005	0.55	0.55	1.80	0.96	2.05
Actual	0.995	1.002	0.500	0.504	1.750	0.914	2.001
Dimension	F Minor Dia	G	H Dia	I Dia	I Depth	J	
Nominal	-	0.38	0.344	0.687	0.320	0.50	
Tolerance min	-	0.33	-	-	0.315	0.45	
Tolerance max	-	0.43	-	-	0.325	0.55	
Actual	0.257	0.377	0.354	0.709	0.320	0.501	

In both the steel and aluminum parts the dimensions fell within their tolerance limits. The only exception to this are the hole diameters. The drills cut all of the holes in the part slightly oversized. Despite this, these parts are most likely good since no limits or notes were given on the hole diameters. It is likely that the hole diameter dimensions were just given to three decimal places so that the operator could select the proper fractional drill. In this type of situation in a commercial setting, the customer (if external) or engineering (if internal) would be contacted to ensure that the hole sizes are not critical. If they were critical the holes would be roughed out undersized and then finished by reaming, honing, or another method of creating holes with precise diameters.

We were able to successfully machine the mounting bracket on manual machine tools. Using similar operations, this part could easily be scaled up into a CNC program for a production run. The machining strategy would be altered slightly to take advantage of the CNC machines capabilities. This part could be created using four operations with a conventional 3-axis CNC

milling center. The first setup would face off the top of the part, mill the edges, drill and tap the holes, and put a chamfer around the top face. The next setup would be on the opposite side where the part would be faced to the correct thickness and chamfered all the way around its perimeter. The final two setups would be on two opposite faces and would just consist of chamfering the edges. To reduce the number of setups it would be advisable to check with the customer or engineering to see if the chamfered edges could be done with a pneumatic hand grinder which would eliminate two setups and dramatically reduce the time required to produce a part.

4.2 Connecting Link

The second part chosen to be manually machined is the connecting link. Similar to the mounting bracket, the part specification calls for steel but we chose to create it out of aluminum first. Looking at the drawing in Appendix A – Engineering Drawings, the pockets of the connecting link are very close to the walls of the part. This meant that parallels could not be used when machining, as the milling of the pockets would ruin them. Therefore a fixture is designed and created in-order to hold the part flat in the vice. The fixture drawing is shown in Appendix A – Engineering Drawings. It is designed with milled out pockets that correlate to the pockets in the connecting link so they could be machined without crashing the tool into the fixture.

A large portion of the dimensions on the connecting link drawing are critical dimensions. The dimensions and locations of both pockets are both given to three decimal places and thus must be made very accurately. The tightest dimension is the .273/.275” width of the square

pocket which needs to be within ± .005" of the center of the part. The other very tricky dimension is the .005/.010 radius called for in the corner of the square pocket. The tolerances given on the drawing (Appendix A – Engineering Drawings) are shown in Table 5. All dimensions and measurements for the connecting link are given in inches.

Table 5 - Tolerance Block for Connecting Link

x.xx	± .02
x.xxx	± .010

The tolerance block applies to all dimensions given in the drawing that do not have a specified upper and lower tolerance limit.

4.2.1 CWDG of the Connecting Link

An image from the solid model of the connecting link and the connecting link fixture can be seen in Figure 17 .

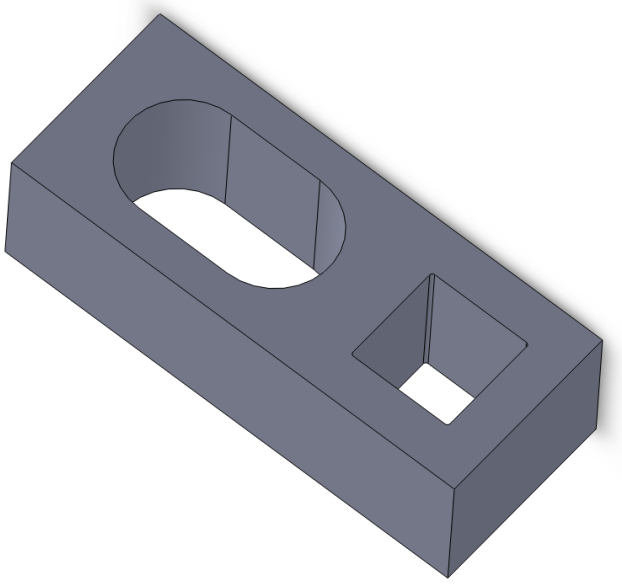

Figure 17 Connecting Link Solid Model

This image is a screenshot of the Solidworks model of the connecting link. For CNC machining applications, this model can be imported into CAM software and tool paths can be generated based on its geometry.

4.2.2 Design for Machining

The first process in machining the connecting link is to square off the stock material. This process is critical as it not only brings the stock down to the appropriate size but it also ensures that the part is truly square. A stock piece that is cut by a ban saw is not perfectly even; the ban saw cannot be used when creating to a tight tolerance if any. Also it is important when bringing the stock down to size to important to break edge so that part sits flat in fixture as well as to not have the tool be digging into the soft material.

The pockets in the connecting link and are drilled before they are milled. This is very important as the drill creates the holes that allow the milling tools to enter. It is important open up these holes so that the milling tool is not plunging into the surface of the part. The drills used are slightly larger than the end mills but not so large that a finishing pass cannot be done. This allows the mills to create the pockets into the proper shape and dimension.

The next step of the process is milling the pockets. The pockets of the connecting link cannot be milled out in one pass, it is important to mill at incremental depths. This means to mill the feature at one depth then again at a second, deeper depth and continue this process until the entire pocket is finished. This should be done using a larger end mill being sure to not mill over the tolerance and leave some material for a finishing pass. The finishing pass can be

done all at once as the chip taken or material removed is not that large. Finally using a file the radius of the corners of the pockets is squared down.

4.2.3 Manual Machining

The powered machinery used to create this part consisted of a band saw and milling machine. The band saw is used to cut the stock into an appropriate size so that there would not be an absurd amount of material removal. The milling machine is used to square off the stock and insert the desired pockets. The tooling used to create the connecting link is listed in Table 6.

Table 6 - Tooling Used to Create Connecting Link

1/8 End Mill
5/16 End Mill
½ End Mill
2.5” Facing Mill
5/16 Drill
15/64 Drill
File

With the exception of the hand file, all of the tooling listed in the table is used with the milling machine.

4.2.4 Results and Discussion

To document the results efficiently and effectively, a modified drawing (shown in Figure 18) is created to replace the numeric dimensions with symbolic dimensions. After the part is completed, it is measured with calipers and the results were recorded in Table 7.

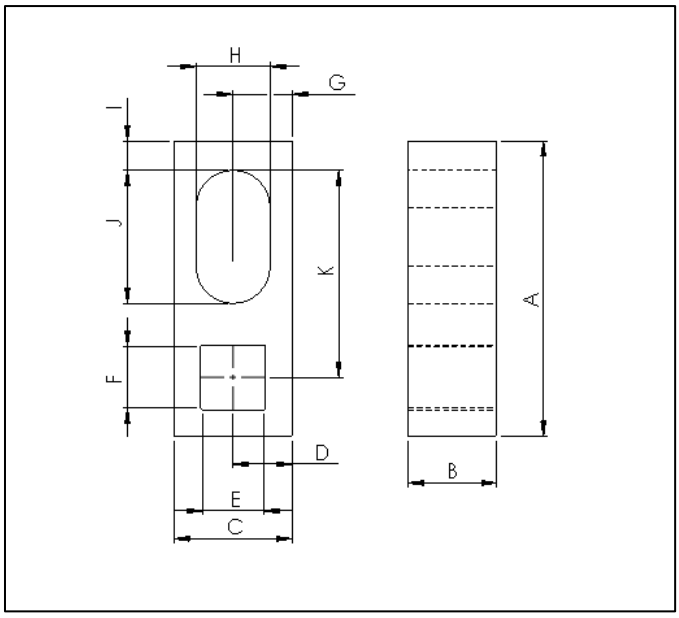

Figure 18 Connecting Link Drawing for Measurement

Table 7 – Measurement of Connecting Link

Dimension	A	B	C	D	E	F
Nominal	1.25	0.375	0.50	0.50	0.273	0.275
Tolerance Min	1.23	0.365	0.48	0.48	0.263	0.265
Tolerance Max	1.27	0.385	0.52	0.52	0.283	0.285
Actual	1.249	0.375	0.496	0.496	0.282	0.273
Dimension	G	H	I	J	K	
Nominal	0.25	0.312	0.125	0.562	0.875	
Tolerance Min	0.23	0.302	0.115	0.552	0.865	
Tolerance Max	0.27	0.322	0.135	0.572	0.885	
Actual	0.249	0.318	0.119	0.569	0.875	

The connecting link is machined to tolerance with the exception of one major operator error. The error occurred while finishing the small square pocket of the part. While operating the table the confusion of rotating the handle jog in one direction with reference to the numbers on the handle itself is not the same direction as on the control panel. The finished part can be seen in Figure 19. Further iterations of this part were not attempted because we were not able to file in the .005/.010" radius in the corner of the square pocket as hoped. This could be accomplished by using an EDM machine with .010 diameter wire.

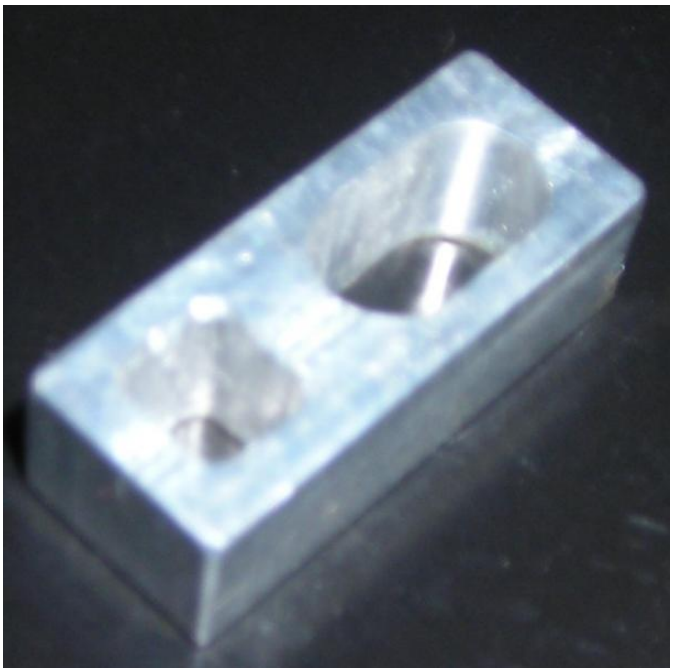

Figure 19 Connecting Link

The greatest challenge with the connecting link comes from its small size. The walls on the side of the pockets are thin enough to prohibit using a standard setup with parallels. Instead, a special fixture had to be created to hold the part flat without damaging the tooling.

We were able to successfully create the fixture needed to create the part but our tooling is not small enough to create the small radii called for. In a production setting it would probably be best to machine all of the part except for the square pocket on a CNC milling machine. The square pocket should be roughed out on the milling machine but then finished on an Electric Discharge Machine using a .01" wire. Our process is a good start towards production of this part but the additions mentioned above are necessary for it to be a viable commercial production strategy.

4.3 Connecting Link Fixture

The connecting link fixture is made out of 6061 Al. This material is chosen because it is on hand in a convenient size and due to its ease of machining. In addition, the fixture is softer than the steel parts it is going to be used to produce so it will not scratch the steel and ruin the surface finish.

The fixture plate for the connecting link has three critical dimensions/tolerances. The first is that the thickness of the part should be close to but less than .5". Since the lower end of the connecting link thickness tolerance is .480" we designed the fixture to be close to this value. The next requirement for the part is that the top and bottom surface of the part are parallel. This ensures that the connecting link will sit flat in the fixture. The final consideration for the fixture is the relief locations. These must match the dimensions on the connecting link so that the drills and end mills used to create the connecting link do not hit the fixture.

4.3.1 CWDG of the Connecting Link Fixture

An image from the solid model for the connecting link fixture that is created in Solidworks is shown in Figure 20.

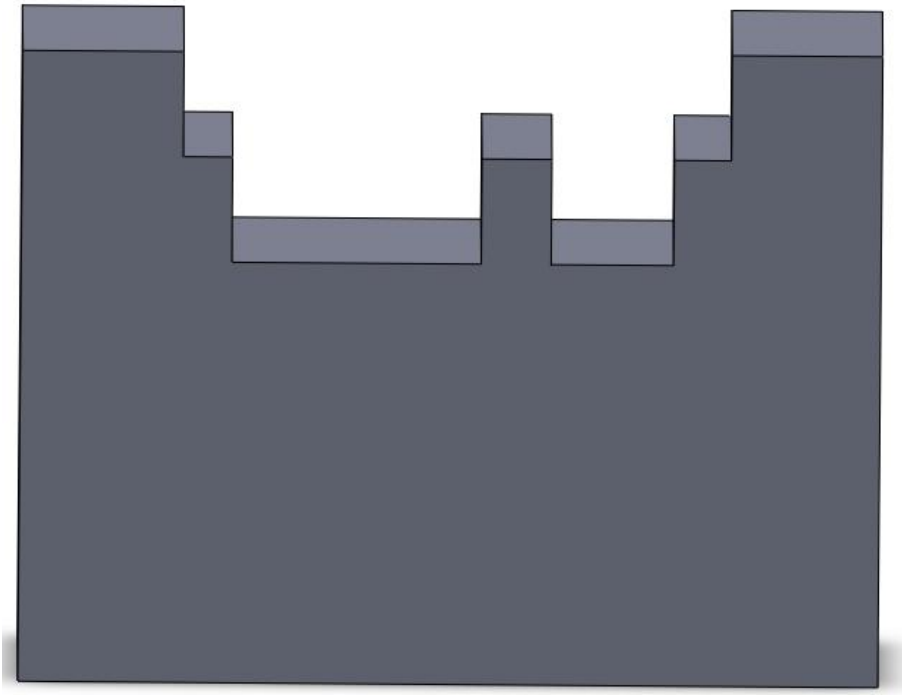

Figure 20 Connecting Link Fixture Solid Model

The solid model is created quickly to represent the functional requirement of the part. Because of this, dimensions such as the overall length and height of the part are not important and no effort is expended to attempt to make the fixture look exactly as it is modeled or drawn.

4.3.2 Design for Machining

The first step in creating the connecting link fixture is the same as in all of the other processes; the stock must be squared off. As previously stated this is an important step and

even more so for this part as it will affect the connecting link as well. After squaring the stock the material is laid out. This provides the capability of looking at what the finished part should be as well as what exactly needs to be done.

The final step is to mill the profile. This part has two critical dimensions that need to be correct. These dimensions are the locations and sizes of the two pockets. The starting location of the seat is not critical as all the connecting link needs is a thin wall to be supported against. The pockets are then milled out leaving the needed space to mill out the pockets of the connecting link.

4.3.3 Manual Machining

Two machines were used to create the fixture plate. First the band saw is used to cut the stock to size. Next a milling machine is used to square up the stock and bring it to finish dimensions and then to mill the reliefs into the part. The tooling used in the creation of the connecting link fixture is shown in Table 8.

Table 8 - Tooling For Connecting Link Fixture

File
2.5” facing mill
.5” end mill
.25” end mill

All of these tools are used with the milling machine except for the file which is a hand tool that is used to remove sharp edges and burs.

4.3.4 Results and Discussion

A fixture is created that gave sufficient support and enough space to adequately mill the pockets of the connecting link. The fixture is not created as depicted due to a slight operator error but is capable of being salvaged. The part is rotated 180 degrees and milled from the other side; as stated before there were only two real critical dimensions. The overall fixture is .481" thick, a perfect fit to hold the connecting link in the vice. A picture of the finished connecting link fixture can be seen in Figure 21.

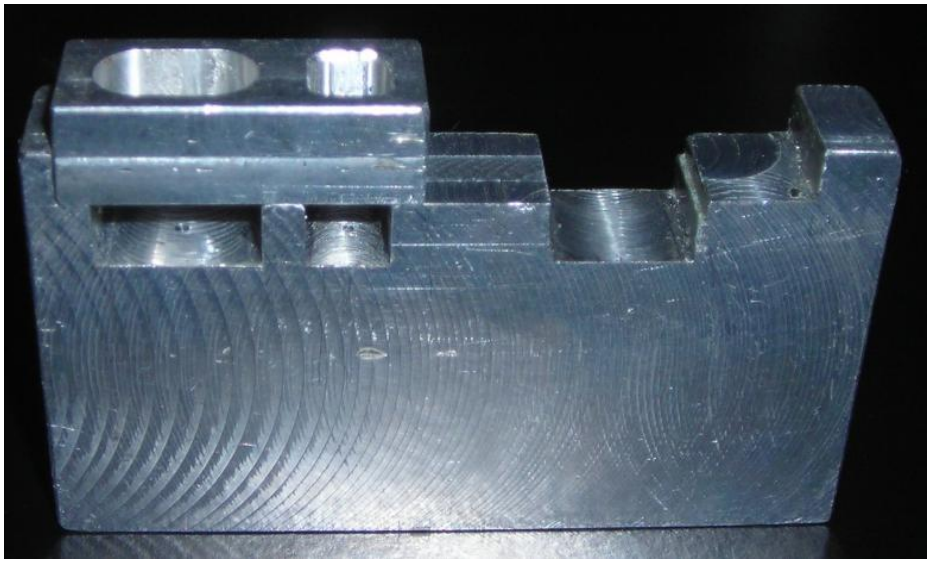

Figure 21 Connecting Link Fixture with Connecting Link

The fixture needed to hold the connecting link flat during machining is successfully created out of aluminum on a manual milling machine. Due to an operator error, the fixture does not look exactly like the drawing because we had to start over using the excess stock on the other end of the component. However, we were able to maintain the design intent of the part and create a functioning component. This part is created very much like it would be

created in industry for a single piece fixture. A very similar fixture is created by one of the group members over the past summer at a machine shop in Worcester using the same machining strategies on similar equipment. This component is a simple but good example of the design process from the identification of need, to a working design, to a production plan, and the realization of the component.

4.4 Manifold

The first component we created using CNC machining is the manifold (10351250). This component is made up of two separately machined parts that are connected with a 3 mm fillet weld. Welding is outside of the scope of this project so the two pieces were created and the welding is left for company to complete. In this report the thin longer piece will be referred to as the "manifold plate" and the part with the tapped holes will be referred to as the "manifold block". The manifold drawing (Appendix A – Engineering Drawings) calls for UNS K02600 steel. The standard surface finish is 6.3 micrometers which applies to the entire part except for the counter bores which call for a 3.2 micrometer finish. The better surface finish is required to provide a good sealing surface for the hardware that mate with the manifold. There are no tightly tolerances dimensions on the manifold. All dimensions are given with no decimals or one decimal which call for fairly loose tolerances. The functional requirement of the part is that all of the mating fixtures fit into the threaded holes and form a tight seal.

4.4.1 CWDG of the Manifold

The manifold drawing is shown in Appendix A – Engineering Drawings and images of the manifold plate and manifold block solid models are shown in Figure 22 and Figure 23 respectively.

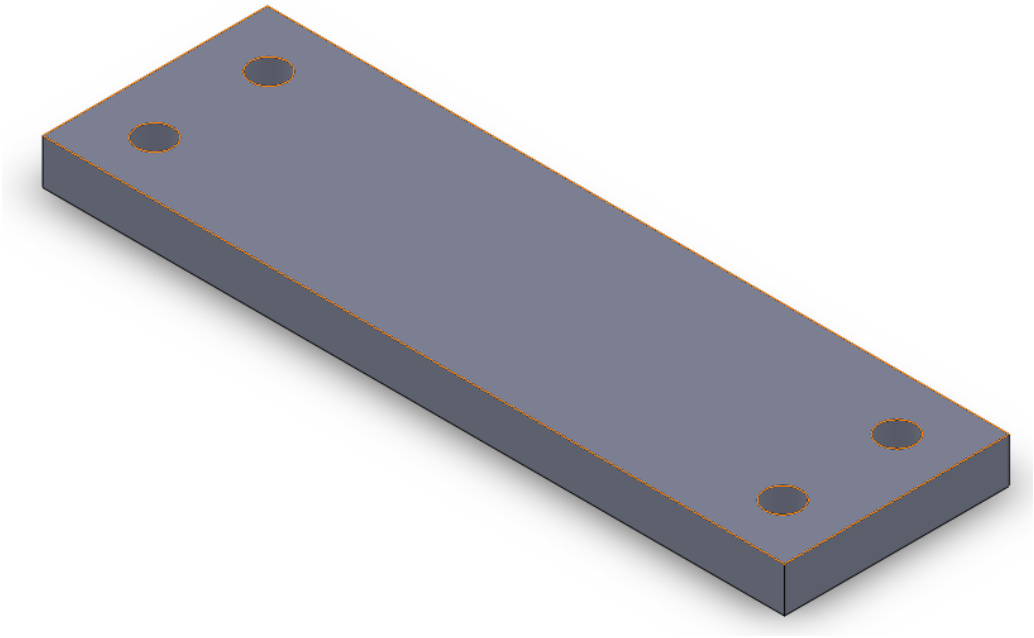

Figure 22 Manifold Plate Solid Model

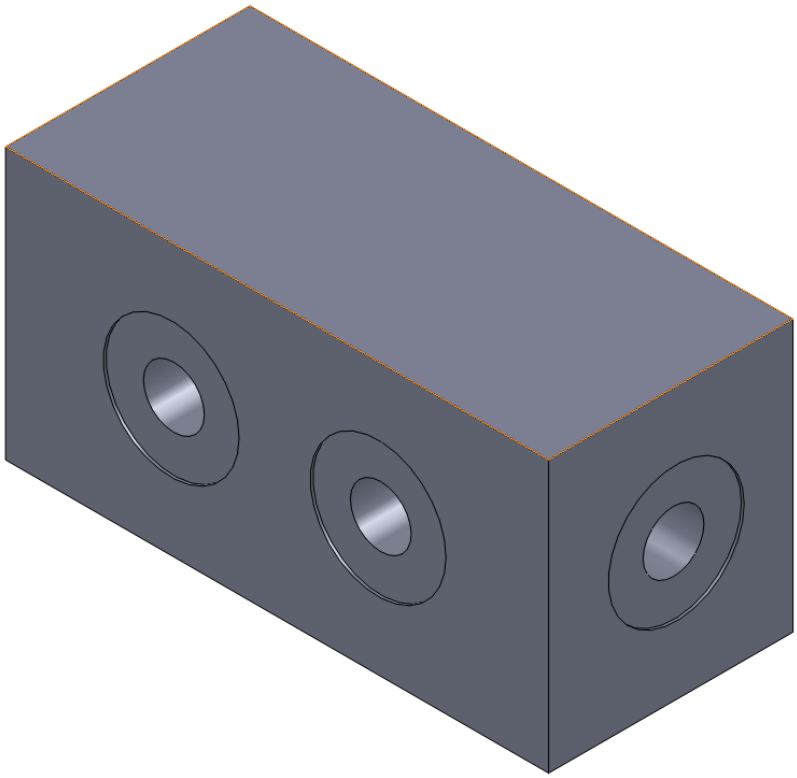

Figure 23 Manifold Block Solid Model

These components have been created in Solidworks and can be combined into an assembly or exported to CAM software for NC code generation.

4.4.2 Design for Machining

The manifold plate can be manufactured in two setups. The first setup creates the finished surface on five of the faces as well as drilling the four holes. The stock is placed in a vice on parallels such that the largest face of the material is facing up and is at least .415” from the top face of the vice. First the facing mill is used to take a chip (~.015”) on the top surface to clean it. Next, a .5” end mill is used in a contouring operation to bring the 4 sides of the part down to their finished size. Finally, a center drill and then an 8 mm drill are used to create the

four holes. At this point the part must be taken out of the vice and flipped over. The final operation is to face the surface of the part to its finished thickness. A computer simulation of these two strategies is shown in Figure 24 and Figure 25.

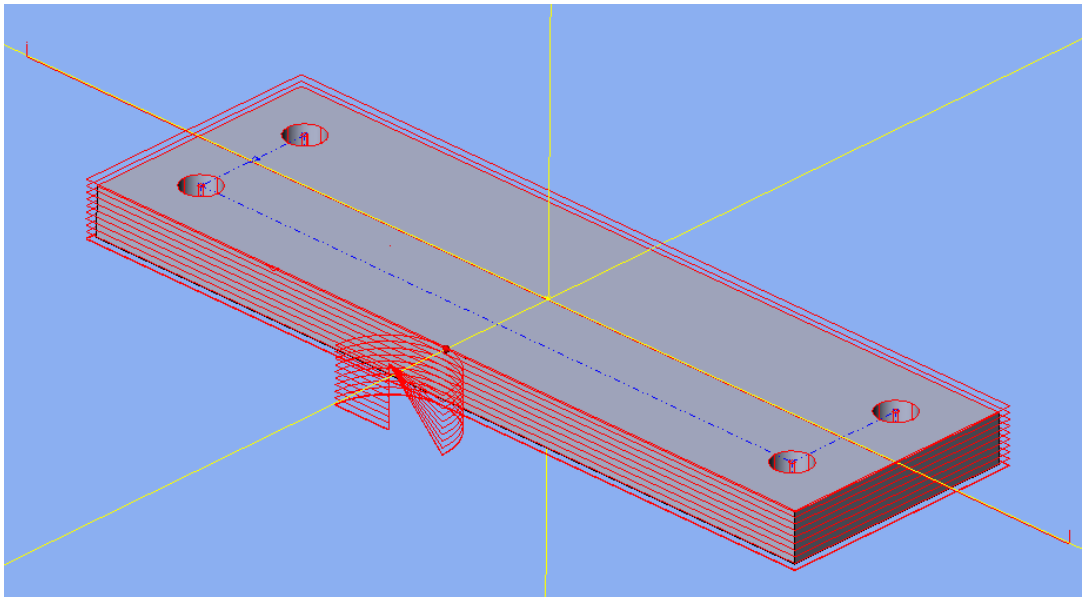

Figure 24 Manifold Plate Ideal Strategy Setup 1

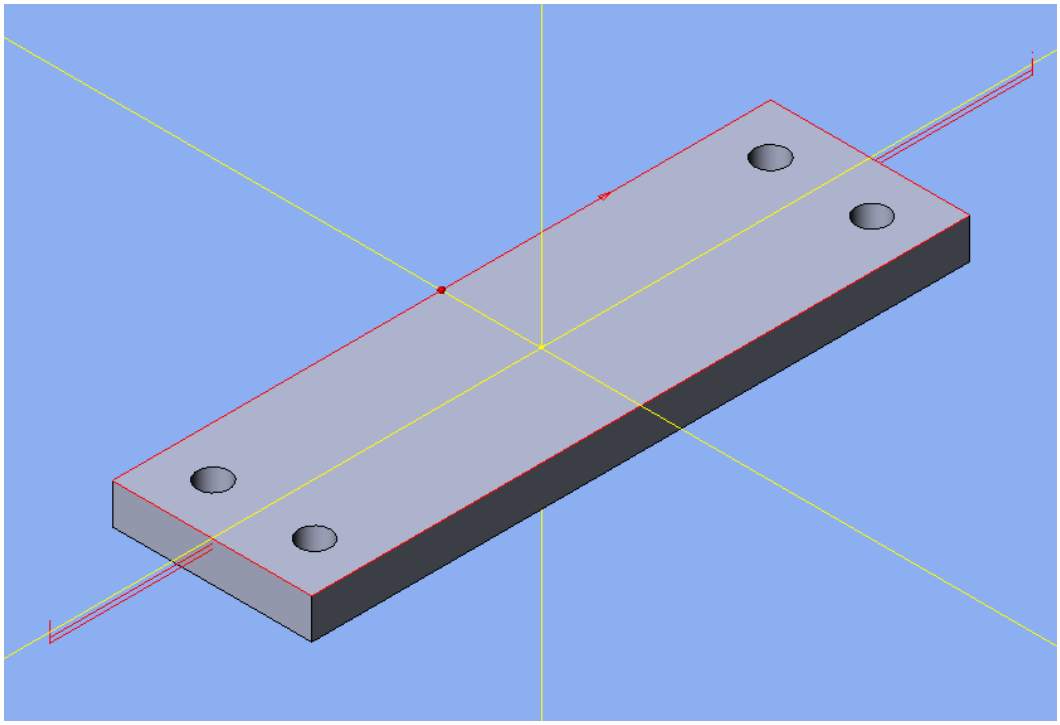

Figure 25 Manifold Plate Ideal Strategy Setup 2

Unfortunately the aluminum that we were able to obtain is only .5” thick and did not allow enough stock to hold the piece in a vice and complete the first setup as described above. Instead, six setups are used to face each of the surfaces. The final operation is to face the large surface and drill the four holes. An example of the facing operation is shown in Figure 26 and the finishing operation is shown in Figure 27.

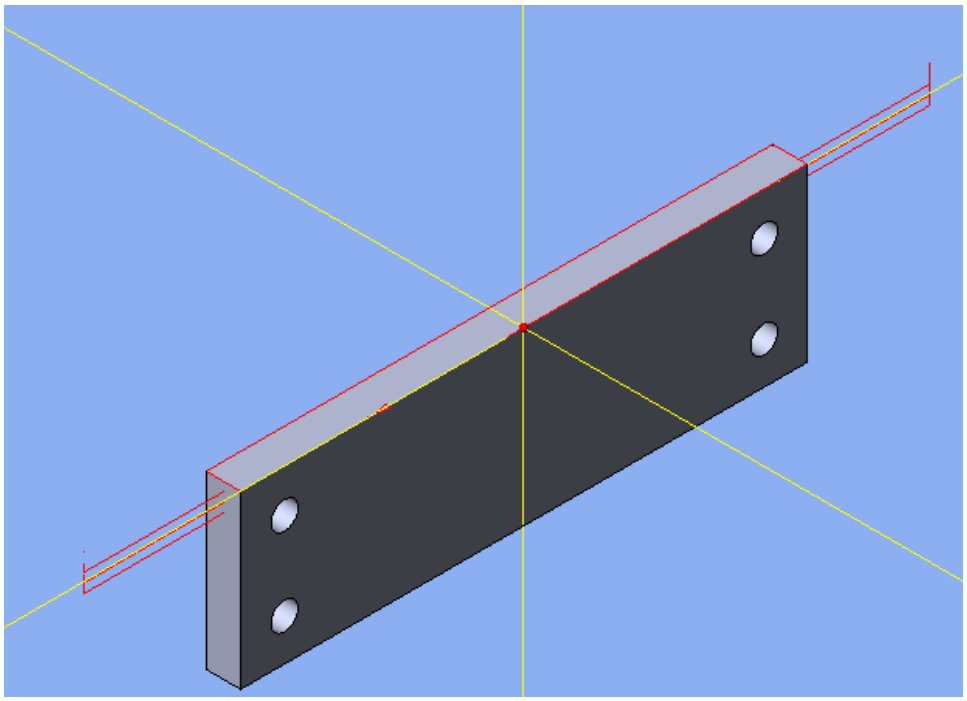

Figure 26 Manifold Plate Improvised Strategy Facing Example

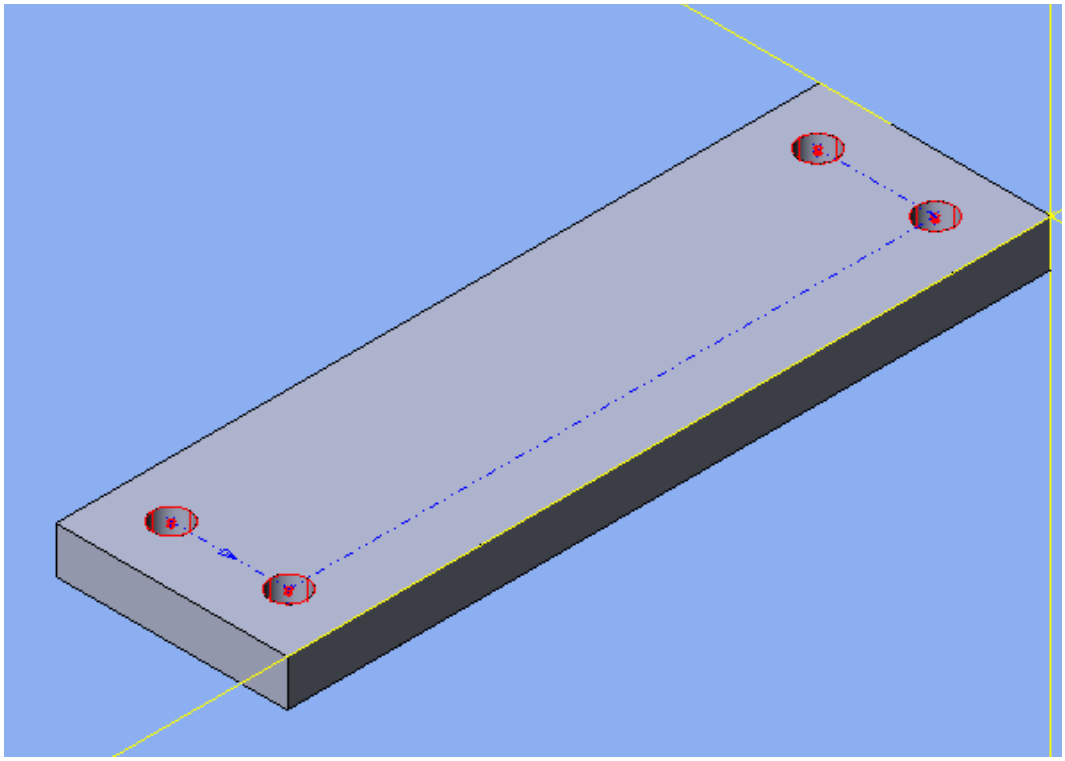

Figure 27 Manifold Plate Improvised Strategy Finishing Operation

The manifold plate is small enough the each facing operation could be accomplished in one pass. The contouring operation uses a climb milling strategy to create a better finish than conventional milling. A pecking strategy is utilized during drilling to ensure that chips could be evacuated from the hole. Table 9, shows the feeds, speeds, and depths of cut used in creating the manifold plate. Coolant is used for every operation except for the facing. A hand file is used to break sharp edges and remove burns on the part.

Table 9- Feeds and Speeds For Manifold Plate

Tool	Spindle Speed (RPM)	Feed (IPR)	Incremental Depth of Cut
3" Facing Mill	4000	36	.100
½" End Mill	4000	44	.100
Center Drill	2000	6	.030
8 mm Drill	2000	6	.100

The first machining strategy we used is similar to the ideal strategy for the manifold plate. This strategy attempts to machine five sides of the part in one setup to rapidly achieve the overall geometry. All of the setups in this strategy consist of placing the stock in the vice on top of parallels. The first operation is facing the top of the part with a 3" facing mill. Next, a long ½" end mill is used to contour out the four sides. After these five sides are created the part is flipped over and the opposite side is faced to the finished size. At this point the overall dimensions of the block are in place. The next four operations all consist of drilling the 11.2 mm holes and milling the counter bores. To avoid deflection of the drill during drilling, the long hole is drilled first. Ideally this would be done all the way through the part from one side.

However, we do not have a long enough drill and thus have to drill half way through from each side. After the long hole is drilled and the accompanying counter bores milled, the shorter holes coming in from the side can be drilled. The order of these last two setups does not matter and either the side with one hole or the side with two holes can be completed first. All of the counterbores are milled with a 3/8" end mill. The counterbores are milled after drilling the holes so that the end mill could plunge into the hole and use a concentric out tool path to create the finished surface. Since we do not have the required ¼" BSPP tap at the time of machining, the thread will be added later by hand. In future production, a tapping cycle will be added to the CNC milling program.

The strategy described above does not achieve satisfactory results. The side milling with the long ½" end mill produces a very bad surface finish. We attempted to improve the surface finish by reducing the incremental depth of cut, but this did not significantly improve the finish. In addition, the side milling operation takes a very long time to complete, especially with the reduced depth of cut. Machining all five sides in one operation does not save much setup time in the case because four of the sides require another set up anyways to drill the holes and mill the counterbores. Because of the failure of this machining strategy, we created a third component with an improved strategy. The tool paths of the failed strategy can be seen in Figure 28.

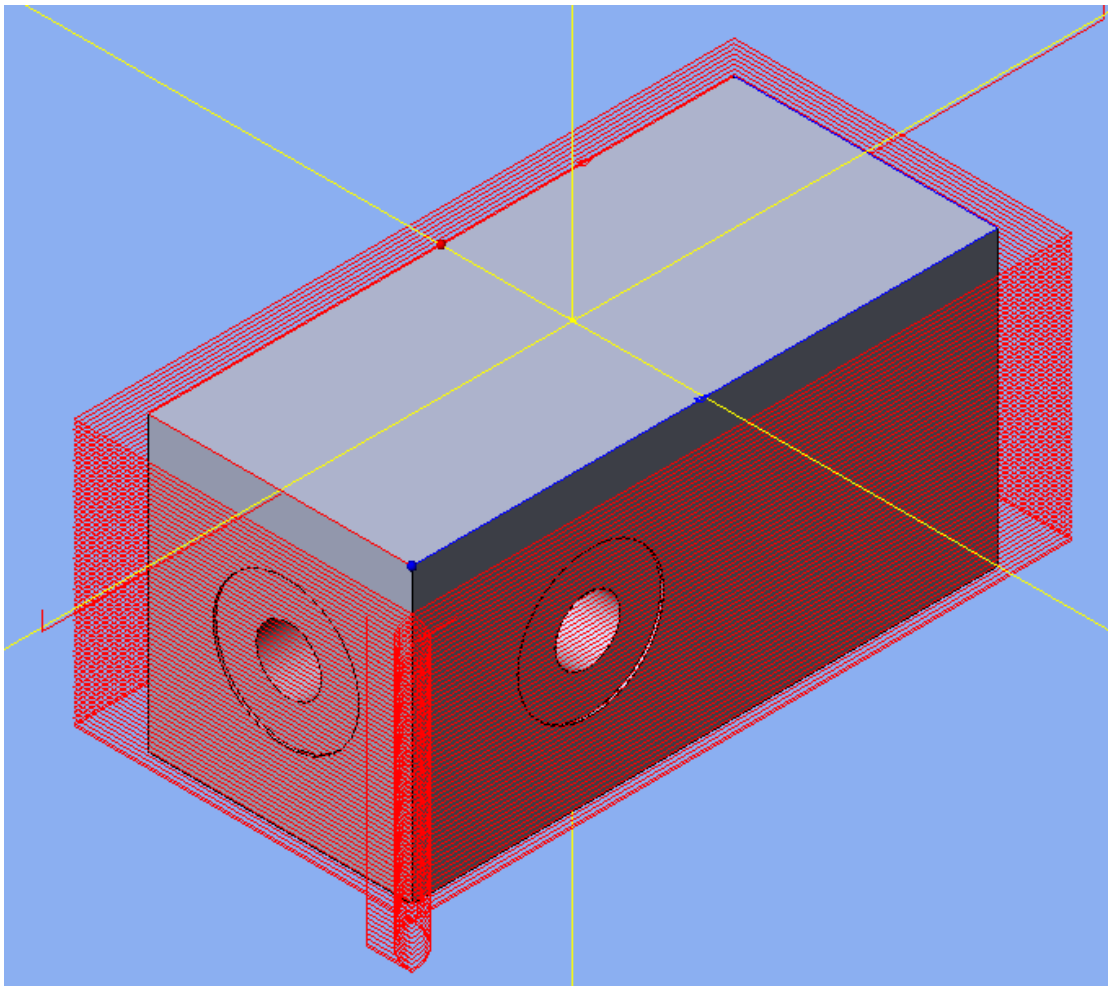

Figure 28 Espirit for Failed Manifold Block Strategy

The improved strategy consists of six setups, one for each of the six faces. In each setup a facing operation occurs to create the finished surface. Then, drilling and counterboring are completed if applicable to that surface. As in the previous strategy, all of the setups are simply the stock in a vice on top of parallels.

In both strategies, climb milling is used for all side milling and pecking is utilized for all drilled holes. Coolant is used for all machining operations except for facing. The feeds, speeds, and incremental depths of cut used in both strategies can be seen in Table 10.

Table 10 - Manifold Block Feeds and Speeds

Tool	Spindle Speed (RPM)	Feed (IPR)	Incremental Depth of Cut
3" Facing Mill	4000	36	.050
3/8" End Mill	4000	28	.020
Center Drill	3000	5	.030
7/16 Drill	325	4	.075

The first two setups are simple facing operations that create the finished surfaces of the faces without holes. These two operations can be exactly the same if half of the excess stock is taken off in each setup. A view of the tool paths used in this setup is shown in Figure 29.

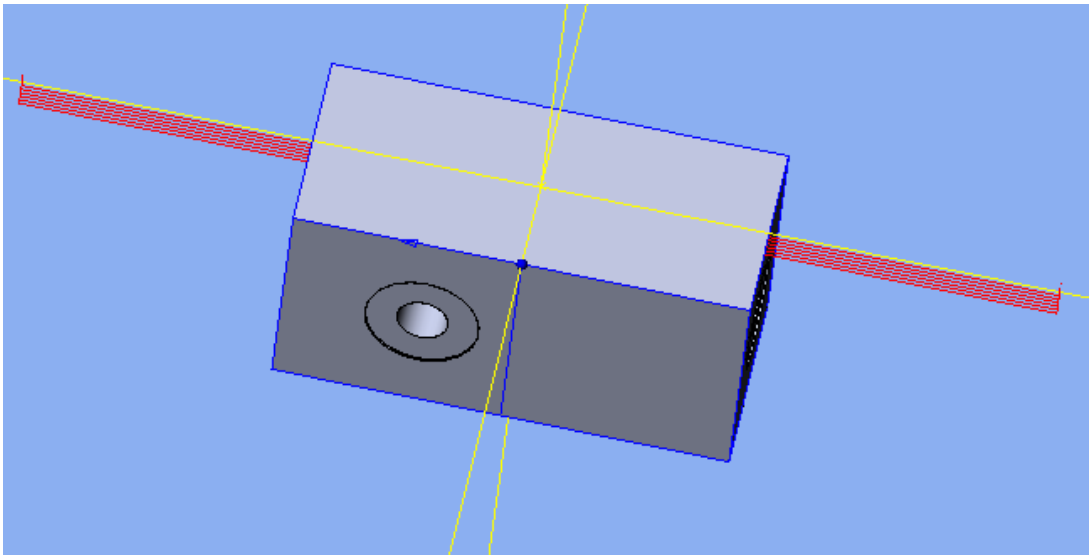

Figure 29 Manifold Block Improved Strategy Setups 1 and 2

After the faces without holes are created, the smallest ends are machined. Ideally setups 3 and 4 would be different, with the long hole being drilled in its entirety in setup 3. However, we do not have a long enough drill and thus have to drill half of the long hole in each setup and hope that they lined up. The first operation in setup 3 and 4 is a facing operation to bring the part to its finished size. We took half of the excess stock off of each end, so these two setups were identical. Next, a center drill is used to create a spot hole to help locate the 7/16" drill. Once the center hole is created, the 7/16" drill is used to drill slightly more than half way through the part. The final operation is to create the .020" deep counterbore using a .375" end mill. A screenshot of the tool paths used in setups 3 and 4 can be seen in Figure 30.

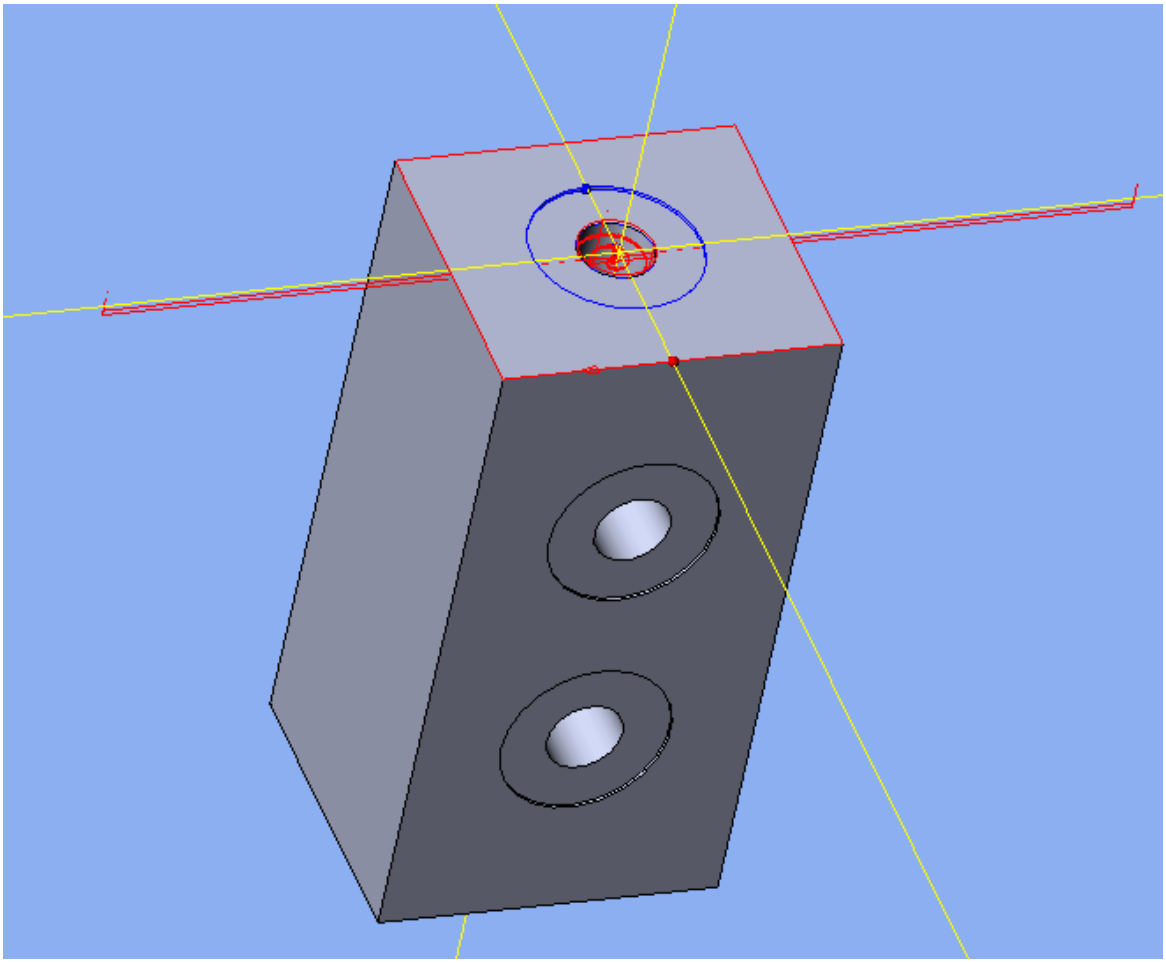

Figure 30 Manifold Block Improved Strategy Setups 3 and 4

Setup 5 machines the face with two holes on it. First, the stock is faced to its finished size (half of the excess stock is taken off in setup 5 and half in setup 6). Next, two spot holes are created by a center drill. After that, a 7/16" drill is used to create two holes that mate up with the long hole drilled in setups 3 and 4. Lastly, a .375" end mill is used to create a counterbore around both of the holes. Figure 31 shows the tool paths used in this setup.

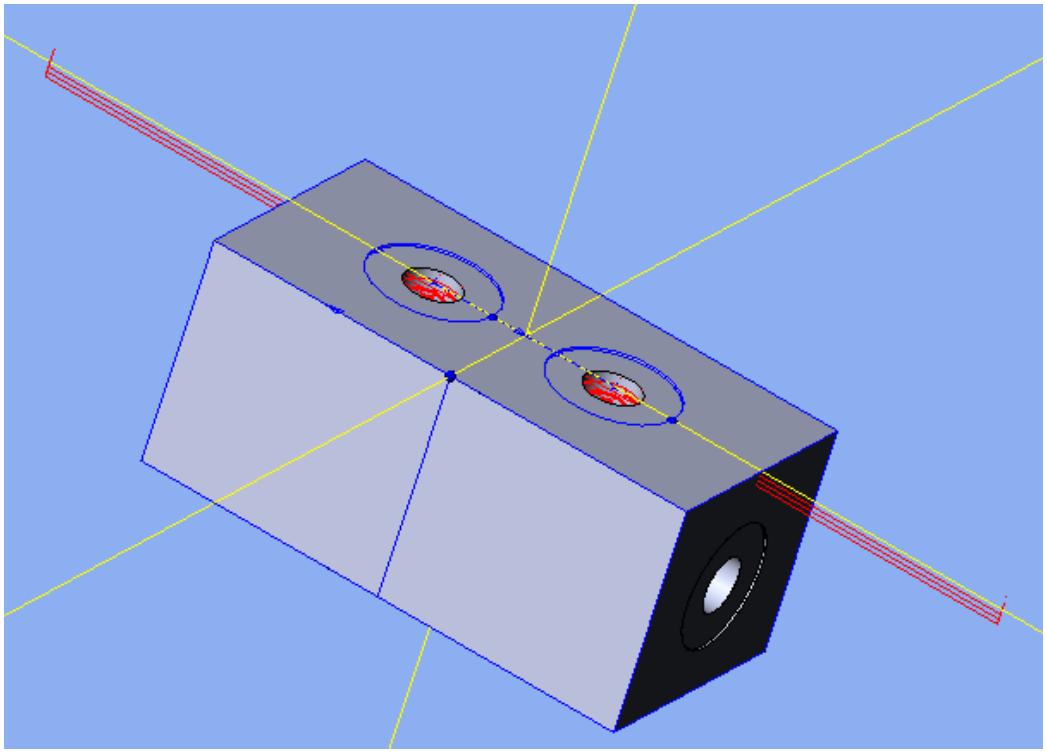

Figure 31 Manifold Block Improved Strategy Setup 5

The final setup for this component is setup 6. Setup 6 follows the exact same procedure as setup 5 except with only one hole. The tool paths for setup 6 are shown in Figure 32.

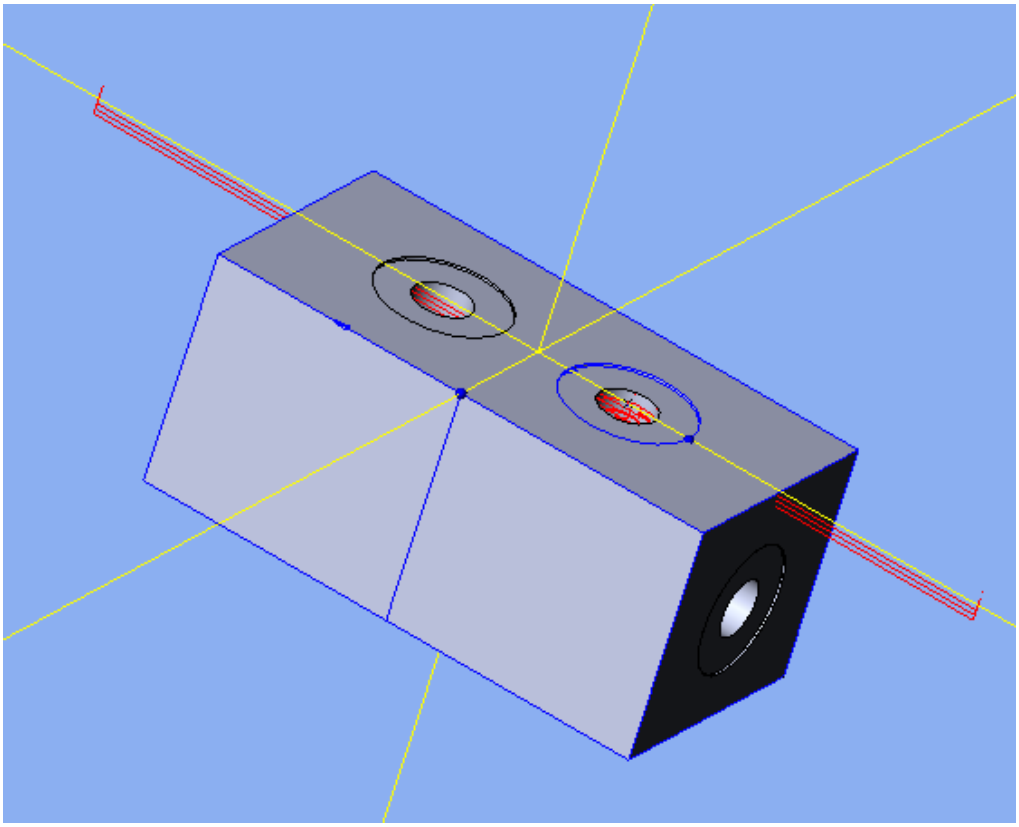

Figure 32 Manifold Block Improved Strategy Setup 6

The improved strategy shown in the previous 5 figures creates the part with the minimum number of possible setups, and should be the most efficient strategy for creating the manifold block.

4.4.3 CNC Machining

To create the components of the manifold we use a cutoff saw and Haas milling machine. The saw is used to cut the stock to its approximate size and the milling machine is used to bring the stock to its finished size and create all of its features. The tooling can be seen in table 11.

Table 11 - Tooling for Manifold

3” Facing Mill
½” End Mill
3/8” End Mill
Center Drill
8 mm Drill
7/16 Drill
File
¼ BSPP Tap

4.4.4 Results and Discussion

To check the dimensions of the manifold plate more efficient, we created an edited drawing shown in Figure 33 that replaces the numeric dimensions with symbols. The measurement of the two manifold plates we created is shown in Table 12 and Table 13.

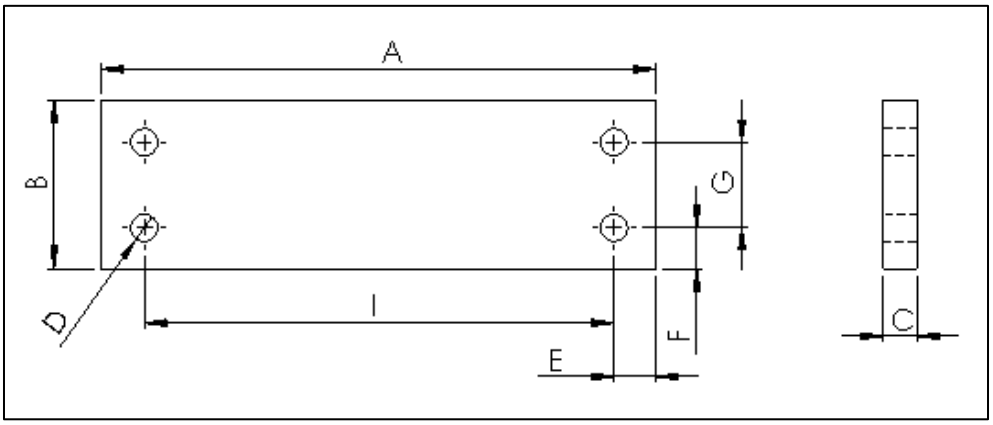

Figure 33 Manifold Plate Drawing for Measurement

Table 12 - Measurement of Manifold Plate 1

Dimension	A	B	C	D
Nominal	6.496	1.969	0.394	0.315
Tolerance Min	6.457	1.988	0.378	-
Tolerance Max	6.535	1.949	0.409	-
Actual	6.5	1.983	0.402	0.319
Dimension	E	F	G	I
Nominal	0.492	0.492	1.000	5.500
Tolerance Min	0.472	0.472	0.984	5.461
Tolerance Max	0.512	0.512	1.016	5.539
Actual	0.485	0.485	0.994	5.504

Table 13 - Measurement of Manifold Plate 2

Dimension	A	B	C	D
Nominal	6.496	1.969	0.394	0.315
Tolerance Min	6.457	1.949	0.378	-
Tolerance Max	6.535	1.988	0.409	-
Actual	6.5	1.982	0.391	0.325
Dimension	E	F	G	I
Nominal	0.492	0.492	1.000	5.500
Tolerance Min	0.472	0.472	0.984	5.461
Tolerance Max	0.512	0.512	1.016	5.539
Actual	0.504	0.489	0.999	5.510

Both of the mounting plates we created are within the dimensions and tolerances specified on the drawings with the exception of the material type. Pictures of the finished parts are shown in Figure 34 and Figure 35.

Figure 34 Manifold Plate 1

Figure 35 Manifold Plate 2

Like the manifold plate, an edited drawing of the manifold block (shown in Figure 36) is created that replaces numeric dimensions with symbolic ones that can more easily be tabulated.

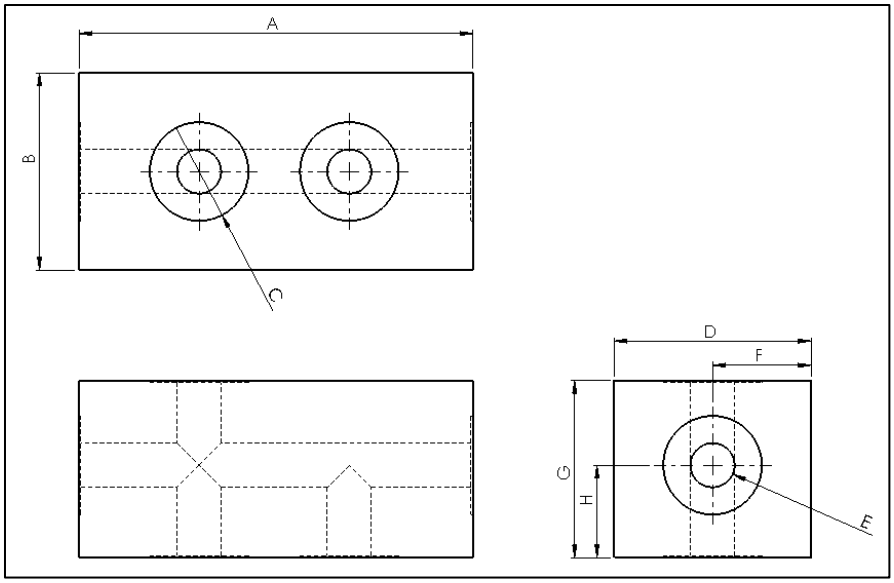

Figure 36 Manifold Block Drawing for Dimensional Analysis

The measurements for both of the manifold blocks we created is shown in Table 14 and Table 15

Table 14 - Dimensional Analysis for Manifold Block (Original Strategy)

Dimension	A	B	C Dia	C Depth
Nominal	3.937	1.969	0.984	-
Tolerance Min	3.917	1.949	-	-
Tolerance Max	3.957	1.988	-	-
Actual	3.937	1.769	0 .965	0.035
Dimension	E	F	G	H
Nominal	0.441	0.984	1.772	0.925
Tolerance Min	-	0.945	1.752	0.906
Tolerance Max	-	1.024	1.791	0.945
Actual	0.426	0.881	1.976	0.940

Table 15 - Dimensional Analysis for Manifold Block (Improved Strategy)

Dimension	A	B	C Dia	C Depth
Nominal	3.937	1.969	0.984	-
Tolerance Min	3.917	1.949	-	-
Tolerance Max	3.957	1.988	-	-
Actual	3.941	1.967	0.969	0.035
Dimension	E	F	G	H
Nominal	0.441	0.984	1.772	0.925
Tolerance Min	-	0.945	1.752	0.906
Tolerance Max	-	1.024	1.791	0.945
Actual	0.427	0.931	1.770	0.875

The manifold block is not machined in tolerance until the second process is used. The centering of the holes is not very accurate because the CAM program had a slightly different location to start from then is programmed into the CNC machine. The other locations and specifications were within the specified tolerances. When machining this component in the future the center will be verified to be the same in both the CNC and CAM software. The finished parts are shown in Figure 37 and Figure 38.

Figure 37 Manifold Block from Original Strategy

Figure 38 Manifold Block from Improved Strategy

The manifold plate is a very straightforward part consisting of just a rectangular prism of material with four holes. Our only issues in the creation of this part occurred because the stock we were able to achieve is too small to enable us to use our preferred machining strategy. Instead of the desired two setups to create the part, we had to use an improvised setup with six setups. In future part production, 5/8" thick stock will be used rather than the ½" inch stock we used in this iteration of the process. Doing this will enable the stock to be held in a standard machine vice on top of machining parallels and the part to be created in two operations as described in the ideal strategy. We were able to successfully create two manifold plates that met every dimensional requirement specified on the print and have a good surface finish. With the exception of the material used, these parts would be of good enough quality to be released to a customer.

The manifold block is another fairly simple part, but it requires many setups due to the counterbores that must be machined into four of the six surfaces. Our initial strategy is not successful because it took an extremely long time to complete and produced a very poor surface finish. We created to blocks with this strategy without putting any features in the blocks. The overall dimensions were very good but the poor surface quality may or may not make the parts unusable depending on their exact usage and functional requirements. In a commercial this is something that would be determined through consulting with the customer. If the bad surfaces will not affect the functionality of the component they will likely accept the nonconforming parts. Using the improved strategy created in the second iteration of the manufacturing process eliminated the surface finish problem while maintaining very good overall geometry. Unfortunately we had some issues with the hole locations in the manifold

blocks. In the block created using the original strategy, the holes were created in the wrong face. This is caused by the visual similarity of the 45mm and 50mm dimensions. This will not be a problem in the future because the holes will be created in the same setup as the facing operation and once the holes have been created on one face, the operator will have a good visual reference to work off of. The second manifold block has end holes that are out of tolerance. This occurred because the part is not centered properly in Espirit. It is close enough to look centered to casual observation but once the parts were created and measured the error is realized. This problem has been rectified for future generations of production. Depending on the exact usage of this component, it is possible that the second nonconforming part could still be used to perform the task it is designed for. We were able to drill and mill counterbores that have a good surface finish providing a seal with the mating parts. To truly complete the parts we need to tap the holes with a ¼" BSPP tap. This should be accomplished in the upcoming term. In addition, the acquisition of a long 7/16" drill will enable the creation of higher quality components as the long through hole could be created in one operation instead of the current two. When attempting to drill a single hole from two directions, it is almost impossible to get an exact alignment. Despite a slight misalignment that occurred in our parts, the functionality of the manifold should not be affected. After two iterations of the manufacturing design process we have overcome several challenges and with the arrival of the needed tooling and the correct material will be able to create high quality parts that can be used in industry.

4.5 Flange

The second part we made for the company is a Flange (10339138). This is the largest component we attempted to make which presented some issues with the standard fixturing

available. Similar to previous parts, we first made the part out of aluminum instead of the steel that is specified by the drawing. The flange contains a large threaded hole (2.25 x 14) that requires special tooling and operations to create. The engineering drawing of the flange is shown in Appendix A – Engineering Drawings.

The flange design calls for UNS G10200 steel. There are no critical dimensions associated with the overall size of the part. All of the critical tightly toleranced dimensions relate to the threaded hole. The first is the location of the threaded hole off of the front of the part. The drawing calls for it to be 34.75 mm which has a tolerance of ± .2 mm or .008" The second tight dimension is the vertical distance between the threaded hole and two of the 26 mm holes. That dimension is 6.75 ±.2 mm. The threaded hole is large and cannot be cut with a tap. As a result a thread mill is needed as well as an undercut tool to create the thread relief at the bottom of the threads. For this part to be functional, the mating part must thread smoothly into the large hole. In addition to the dimensional requirements of the part, the drawing calls for a very good surface finish. A 1.6 micrometer finish is required all over the part. This finish is very good for a milled part.

4.5.1 CWDG of the Flange

We have created two different solid models for this component, the first which is shown in Figure 39 represents the threaded hole as a smooth hole the size of the minor diameter. The second model, shown in Figure 40 shows the finished part with the threads cut into the hole.

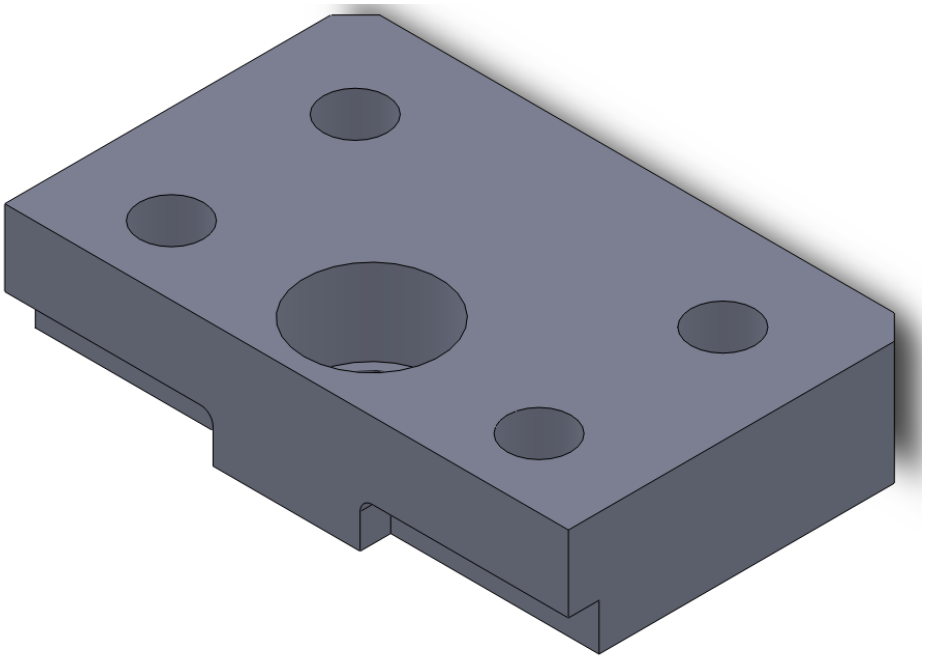

Figure 39 Flange Without Threads Solid Model

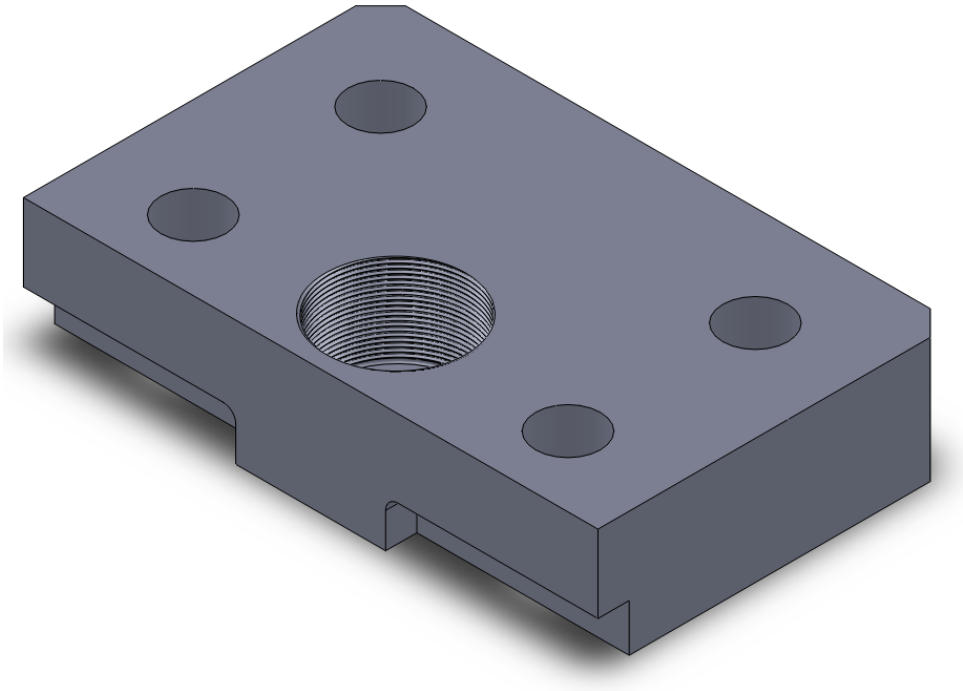

Figure 40 Flange Solid Model with Threads

The threads in Figure 40 are created by sketching the negative of the thread profile and using an extrude cut along a spiral sketch. Although the model with the threads shows the final part more accurately, it is better to use the solid model without threads for CAM and the creation of engineering drawings.

4.5.2 Design for Machining

The flange requires six setups to complete. The first two setups used a large ninety degree angle attached to the table. The stock is then clamped to the table and angle steel using two c-clamps. The c-clamps have copper ends to prevent damaging the surface of the parts. Setups three through six all consist of the stock in a standard vice on top of parallels. Coolant is used in all of these operations except for facing. The external pockets are created using a trochoidal pocketing strategy. All of the milled holes are created by plunging the end mill into a pilot hole and using a concentric out cutting strategy. Climb milling is used in all side milling operations. All sharp edges were broken using a hand file or a deburring tool. The feeds and speeds used for each tool as well as the incremental depth of cut are shown in Table 16.

Table 16 – Feeds and Speeds Used to Create Flange

Tool	Spindle Speed (RPM)	Feed (IPR)	Incremental Depth of Cut
3” Facing Mill	4000	36	.050
3/8” End Mill	4000	28	.050
Center Drill	2000	2	.030
7/16 Drill	250	3.25	.075

Undercut	--	--	--
Thread Mill	--	--	--

The first two setups in the flange manufacturing process machine the left and right sides of the part (the 143 mm x 50 mm faces). The only operation in these two setups is to face the surfaces down to their finished size. If half of the excess stock is taken off in each setup, the same program can be used twice. We chose this approach so new NC code did not have to be generated and loaded. To run setup 2, the part simply had to be flipped over, reclamped, and reprobed. In larger scale production, a work stop would be used so the part would only have to be probed once per production run. An image from the simulation of setups 1 and 2 can be seen in Figure 41.

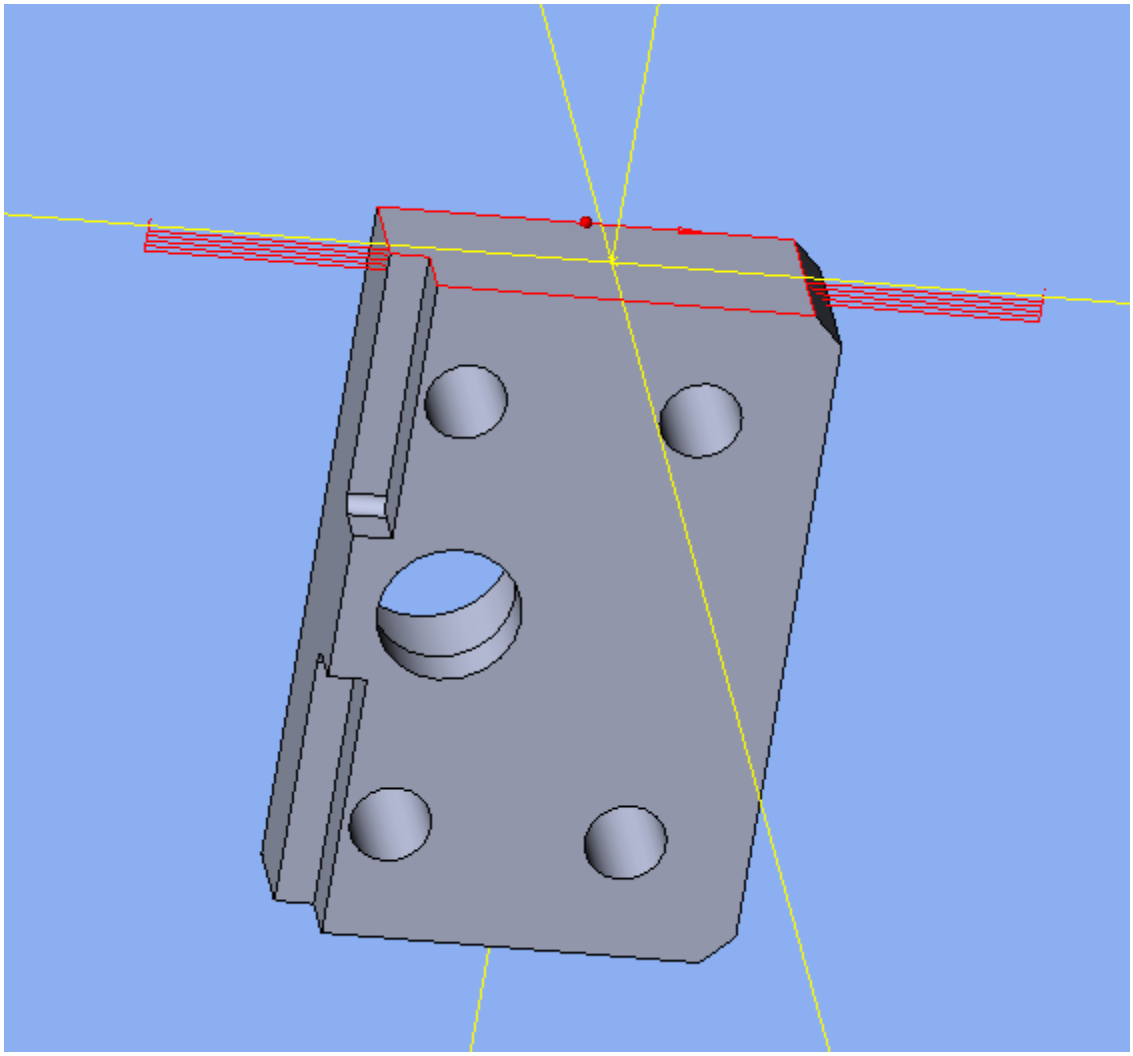

Figure 41 Flange Setups 1 and 2

In the next setup, the back face (the 230 mm x 50 mm face without pockets) is faced clean. We chose to take only a small amount of stock off (about .025”) in this operation and take the rest of the excess stock in the facing operation in setup 4. A screenshot of the Espirit simulation is shown in Figure 42.

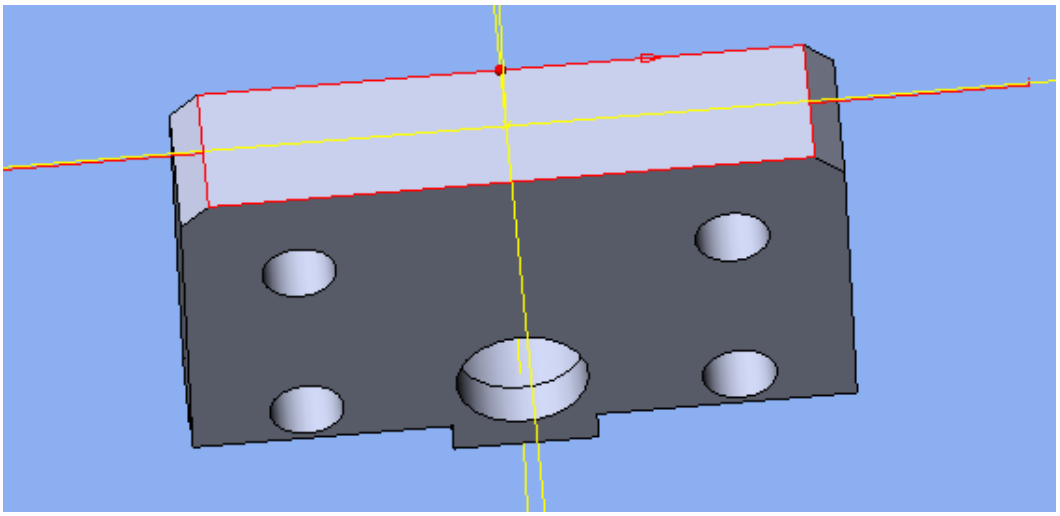

Figure 42 Flange Setup 3

In the fourth setup, the front face is machined. First it is faced down to create the 143 mm dimension. Once that is done, the pockets are milled using a 3/8” end mill. The simulation of setup four can be seen in Figure 43.

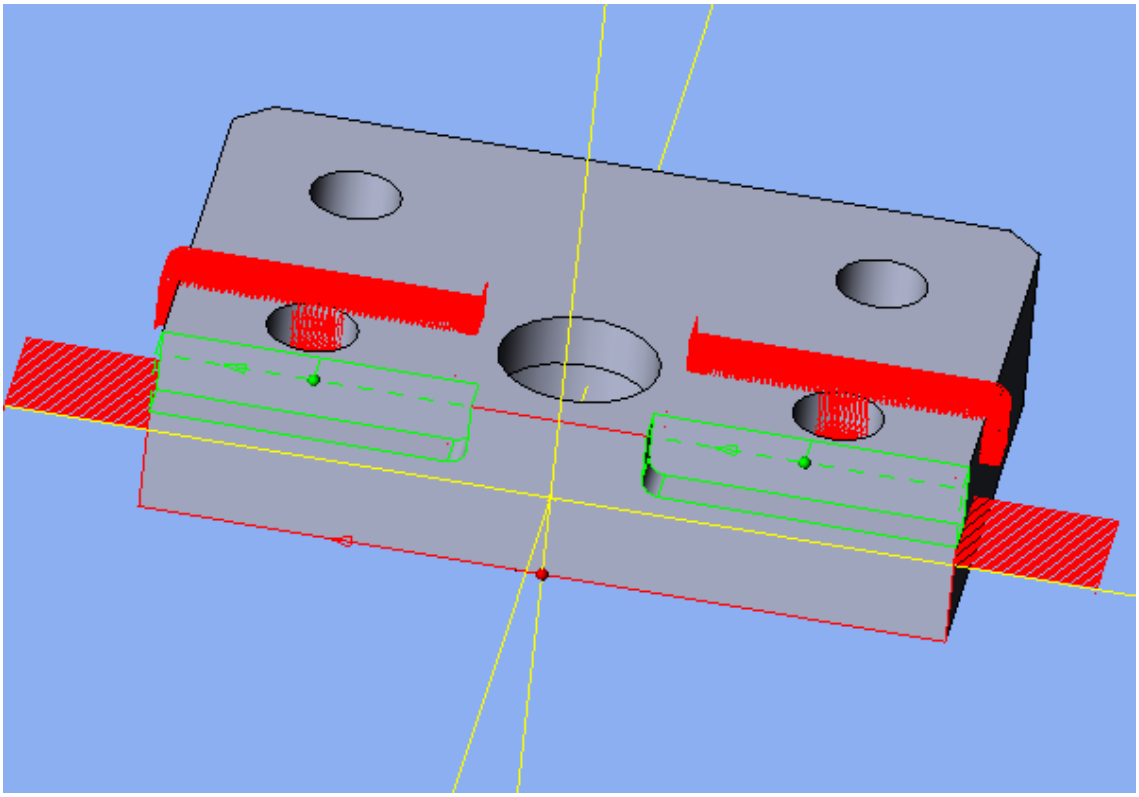

Figure 43 Flange Setup 4

Now that the sides of the stock are finished, the fifth operation will start to add the part's features. First the top surface of the part is faced clean. Next, a center drill is used to spot drill the five holes. Then, the 7/16" drill is used to drill five thru holes that enable the end mills used to create the holes to plunge in without hitting the stock. After the pilot holes are created, a 3/8" end mill is used to create the four 26 mm holes and then to create the minor diameter of the tapped hole (2.173"). Next, the chamfers were milled using a 3/8" end mill. The final steps in this setup cannot be completed at this time due to missing tooling. First, an undercutting tool needs to be used to create the thread relief. Then, the last operation in this

setup will be using the thread mill to cut the 2.25 – 14 thread into the minor diameter created earlier. An image from the Espirit simulation of this setup is shown in Figure 44.

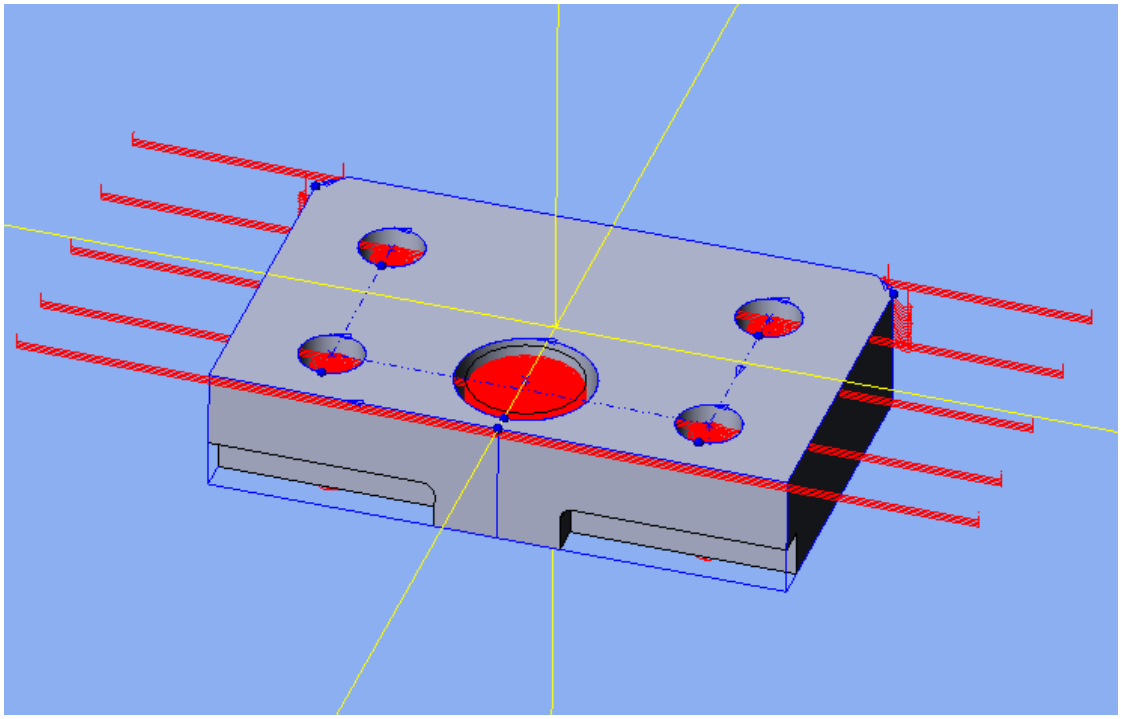

Figure 44 Flange Setup 5

The sixth and final setup is machining the bottom of the part. First, the part is faced to the final thickness (50 mm). Then, a 3/8" end mill is used to create the 46 mm hole using the pilot hole created in the previous setup. The Espirit simulation can be seen in Figure 45.

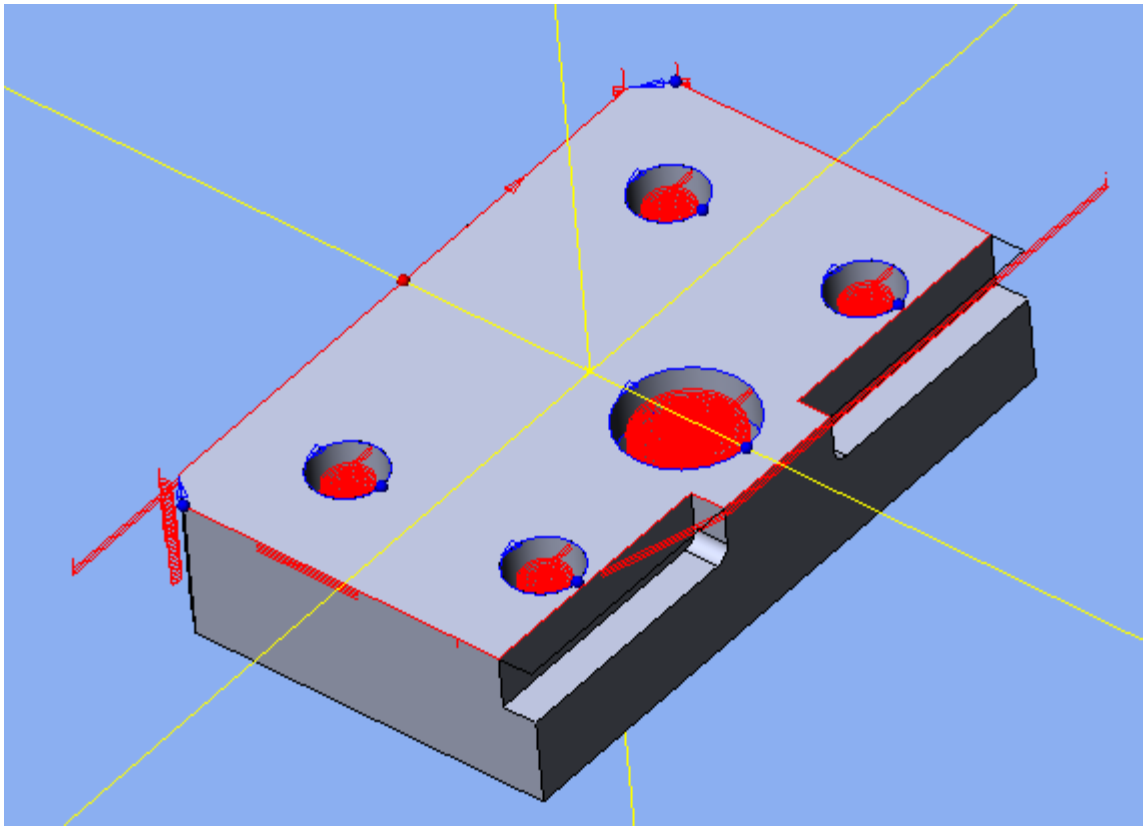

Figure 45 Flange Setup 6

The CAM software we use to generate the NC code makes it very easy to visualize the paths the tools will take. However, care must be taken to avoid relying solely on the CAM software to create the part based just on the solid model. The engineer should simulate the NC code and the machine operator should simulate it again on the CNC milling machine. To ensure the program is performing as expected, parts should be checked in accordance with standard quality engineering procedures.

4.5.3 CNC Machining

To create the flange we used a cutoff saw and Haas CNC milling machine. The saw is used to cut the stock to its approximate size and the milling machine is used to bring the stock to its finished size and create all of its features.

Table 17 Tooling for Flange

3” Facing Mill
Center Drill
7/16 Drill
3/8” End Mill
Undercut Tool
Thread mill (14 TPI)
File

4.5.4 Results and Discussion

To efficiently show the measurement of our completed flange we created an edited drawing that is shown in Figure 46. The measurements taken based off of this drawing are shown in Table 18. With the exception of dimension “A” which is measured with a scale, all measurements were performed with a caliper with a resolution of .001”.

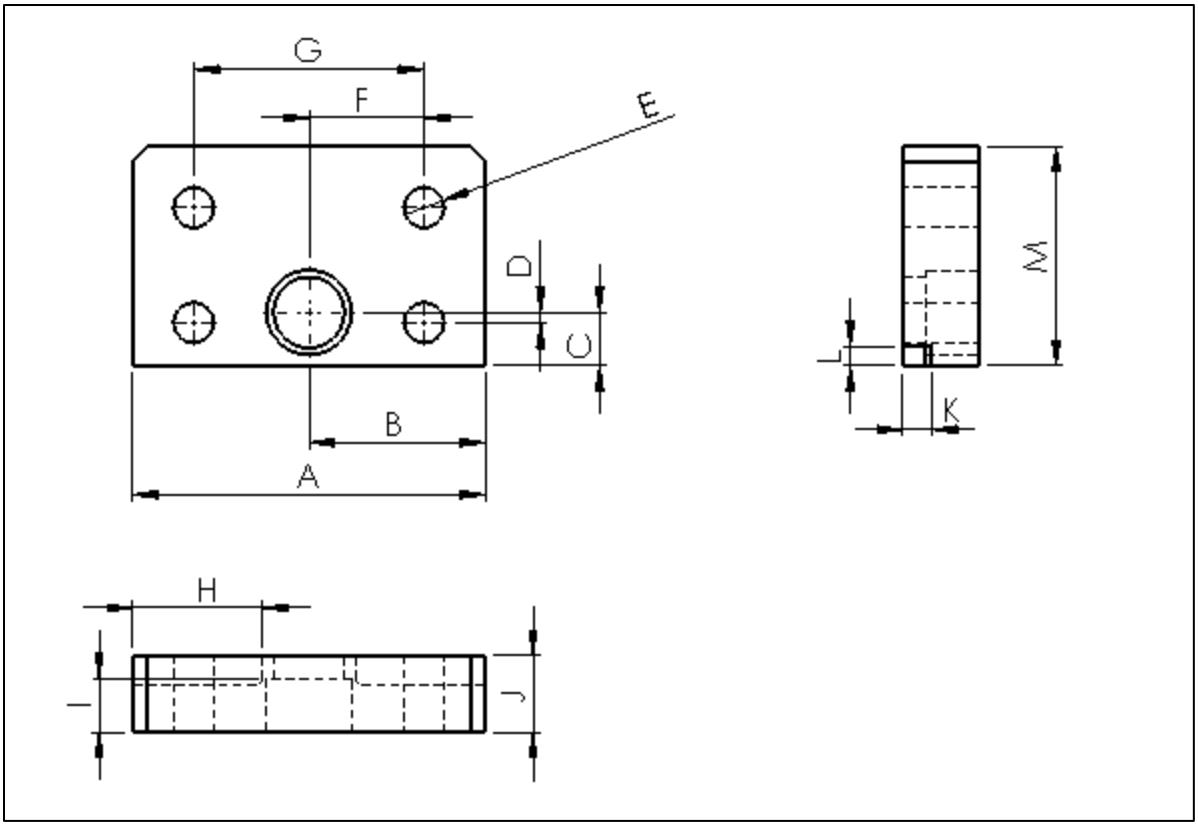

Figure 46 Flange Drawing for Dimensional Analysis

Table 18 - Dimensional Analysis of Flange

Dimension	A	B	C	D	E	F	G
Nominal	9.055	4.528	1.368	0.266	1.024	2.953	5.906
Tolerance Min	9.016	4.508	1.360	0.260	-	2.933	5.866
Tolerance Max	9.094	4.547	1.376	0.272	-	2.972	5.945
Actual	9.060	4.529	1.370	0.265	1.002	2.951	5.884
Dimension	H	I	J	K	L	M	
Nominal	3.346	1.378	1.969	0.492	0.748	5.630	
Tolerance Min	3.327	1.358	1.949			5.591	
Tolerance Max	3.366	1.398	1.988			5.669	
Actual	3.547	-	1.973	0.490	0.748	5.626	

A picture of the finished Flange can be seen in Figure 47 . This part is not complete as it lacks the threads in the large hole.

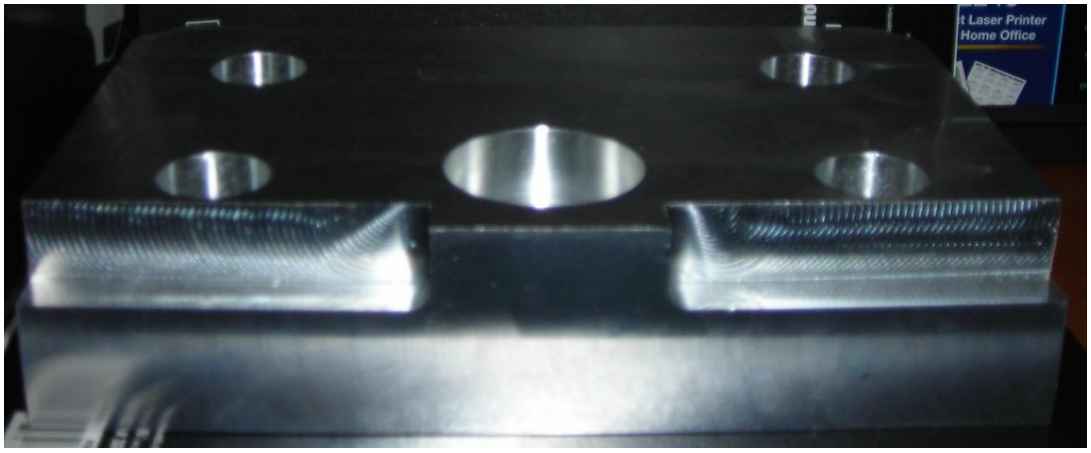

Figure 47 Flange

The flange is the most complicated and difficult component that we created. The increased difficulty is due to both the larger size of the part and the increased number of features. Due to lack of available tooling we were not able to complete the part in its entirety. To do so we need to acquire a thread mill capable of creating a 2.25" x 14 internally threaded hole. In the first iteration of production we discovered a major error that had been made in the initial solid modeling. The 85 mm pocket had been modeled as the distance between the end of two line segments. Once the 5 mm radius is inserted as a sketch fillet, the point that is dimensioned moved and in effect the dimension became 90 mm. After the part is created and measured this mistake is discovered and the model is fixed and the NC code updated for the second iteration of the process. The second issue that is discovered is that the facing operation is creating a bad surface finish when it changed directions on the part. To fix this problem we adjusted the machining strategy so that the facing mill would move in one continuous motion across the part

and not change direction until it is off the part. Both of these changes were successfully implemented into the second iteration of the flange production and the previously non-conforming dimensions meet the tolerances specified on the drawings. We have written CNC programs that prove that the flange features can be created accurately. With the addition of the thread mill and some longer tooling we will be able to create a complete part with a threaded hole in less time than our current process takes. In the upcoming months we will look to implement the new tooling and reduce the cycle time by incorporating multiple tools into the creation of features to increase the material removal rate. The challenge ahead of us will be in debugging the thread mill NC code and in satisfying the surface finish requirement in the steel material called for in the drawing. To do this it may be necessary to add a surface grinding operation to create a very good surface finish. This can be easily added to our current process as the tolerances on the overall dimensions are not very tight.

Chapter 5: Conclusion

Over the course of this project we have gone through several iterations of the design and realization process for creating metal components using machine tools. Utilizing Solidworks for solid modeling and Espirit to create CNC code, we were able to convert commercial drawings into digital solid models and machining simulations. Finally, we were able to bring the machining simulations from the computer onto a computer numeric controlled machine and create a quality part within the specification of the original drawing. Along the way we had to deal with issues such as deciding tooling, stock sizes, machining feeds and speeds, machining strategies, the order of feature creation, and fixturing. In some cases these issues could be resolved by common sense or a quick table lookup. Others required more thoughtful analysis and consultation with more experienced individuals. In the end, a trial and error process is needed to prove the machining process works and to optimize it for increased productivity.

In addition to CNC machining, we also utilized manual milling machines to create parts. Doing so created a deeper understanding and appreciation for the power and capabilities of the CNC machine tool. In addition, it proved that CNC is not always the best answer, sometimes a manual machine tool in skilled hands can get the job done satisfactorily much quicker than a CNC machine tool. We proved this when we were able to quickly design and machine a fixture plane for the connecting link.

Although this project has come to an end, there is still work to be done on the components we have been working with. In the upcoming months some members of the group

will continue to develop our machining processes to continue to create better components in larger quantities. The first improvement that needs to be made is to upgrade to the steel called for in the drawings. To do this, significant adjustments will have to be made to the feeds, speeds, and depths of cut in the CNC programming. In addition, much greater operator skill is needed to determine if the machine tool is operating properly and if cutting conditions or tooling need to be changed.

To create working parts, the group will have to obtain the correct taps called for in the manifold block and the flange. Once these are obtained, they will have to prove their tapping programming on holes in blank parts and finally create new parts complete with threaded holes. The continued work will also require optimization of the CNC programming to reduce cycle times and increase productivity. This will be accomplished by incorporating new tooling and machining strategies into the relatively simple machining operations currently in use.

We were able to achieve our goals of understanding the machining process and completing several iterations of it. We began with a design on paper from either a commercial source or developed ourselves and created a digital version of the part. From there we were able to create CNC programs in CAM software and output those programs to a CNC controller. After selecting and setting up stock we ran the programs we created to make components that met the design intention and tolerances on the engineering drawings.

Appendix A – Engineering Drawings

A.1 Seal Retainer Finished Machined Drawing

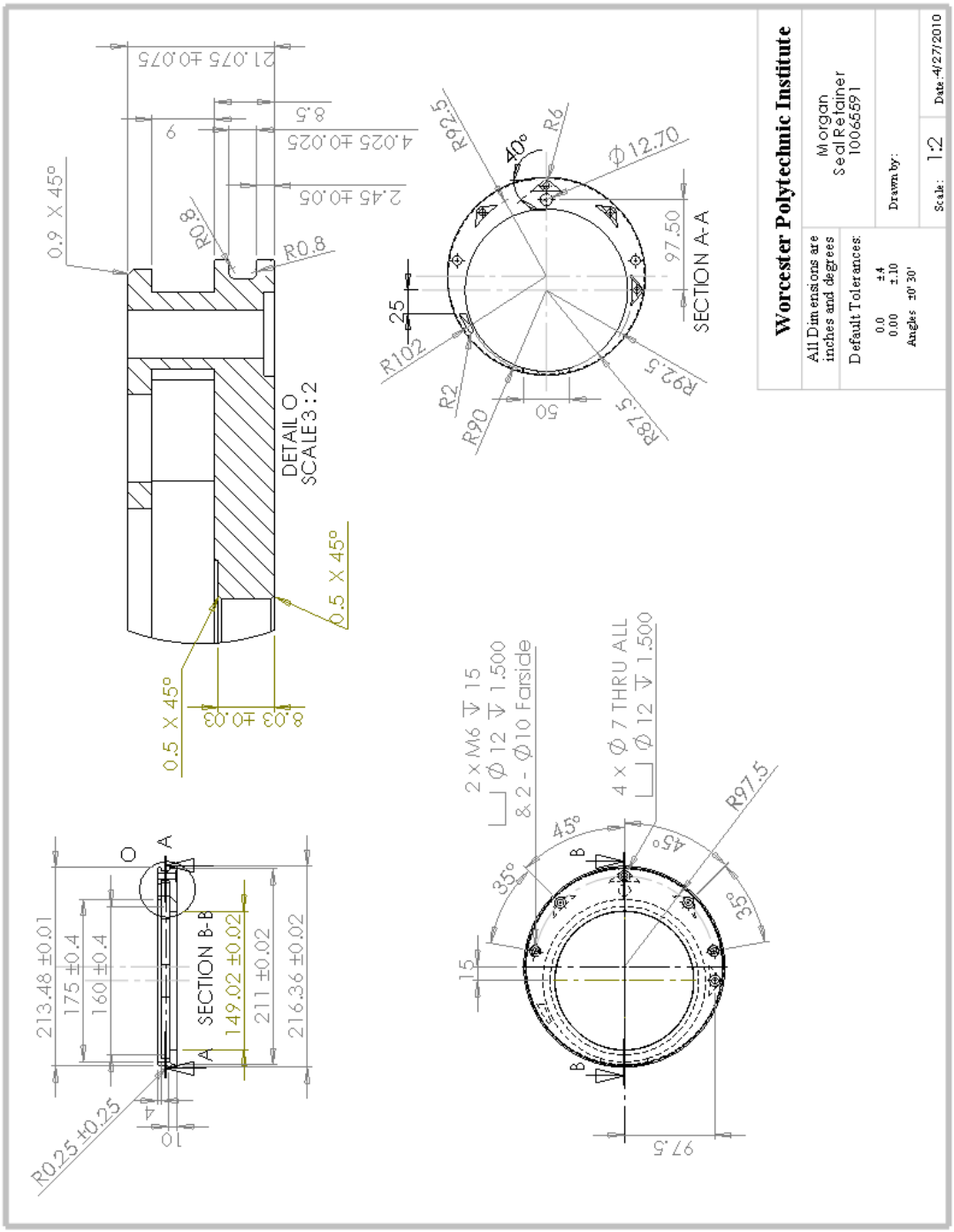

Figure 48 Seal Retainer Finished Machined Drawing

A.2 Seal Retainer as Cast Drawing

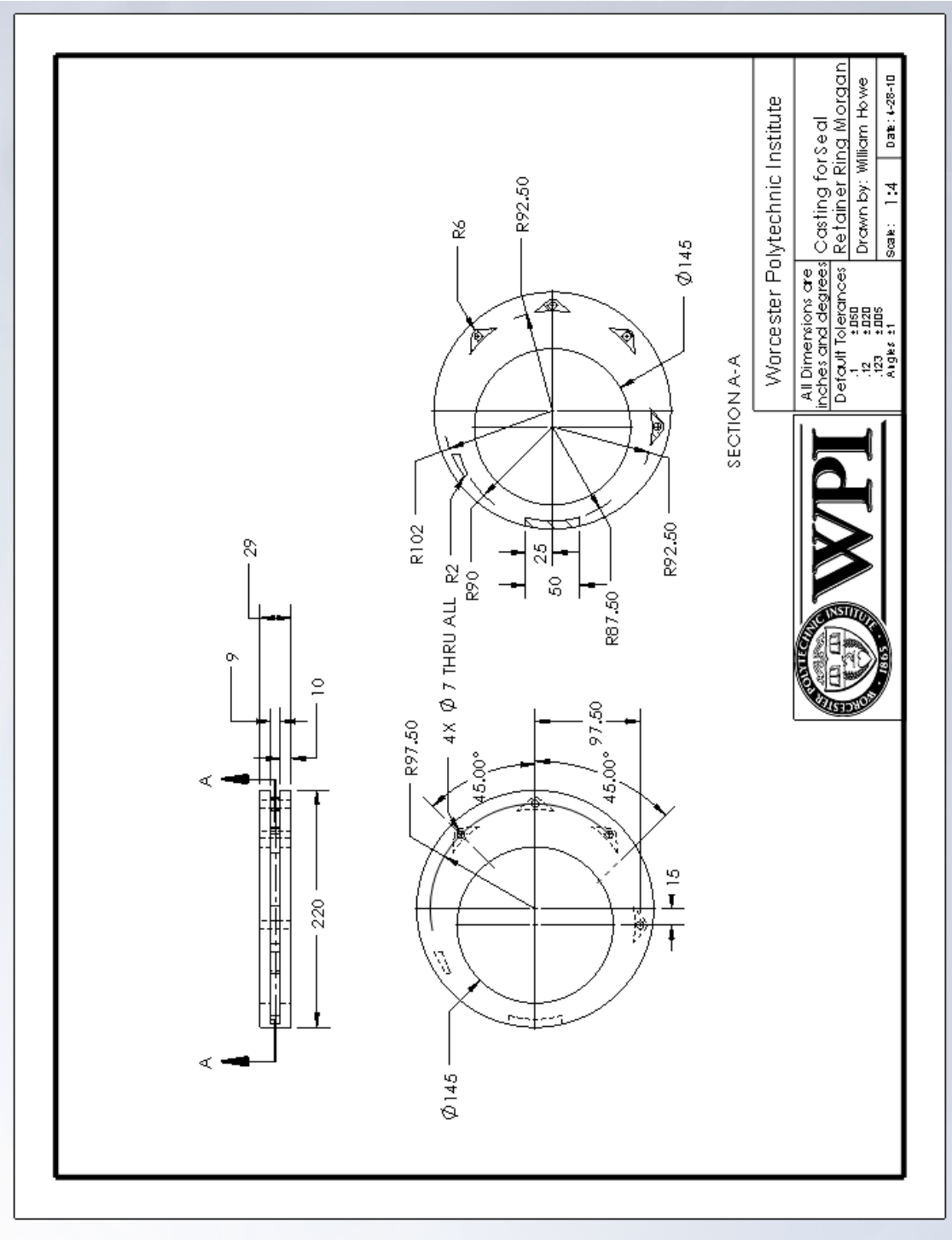

Figure 49 Seal Retainer as Cast Drawing

A.3 Connecting Link Drawing

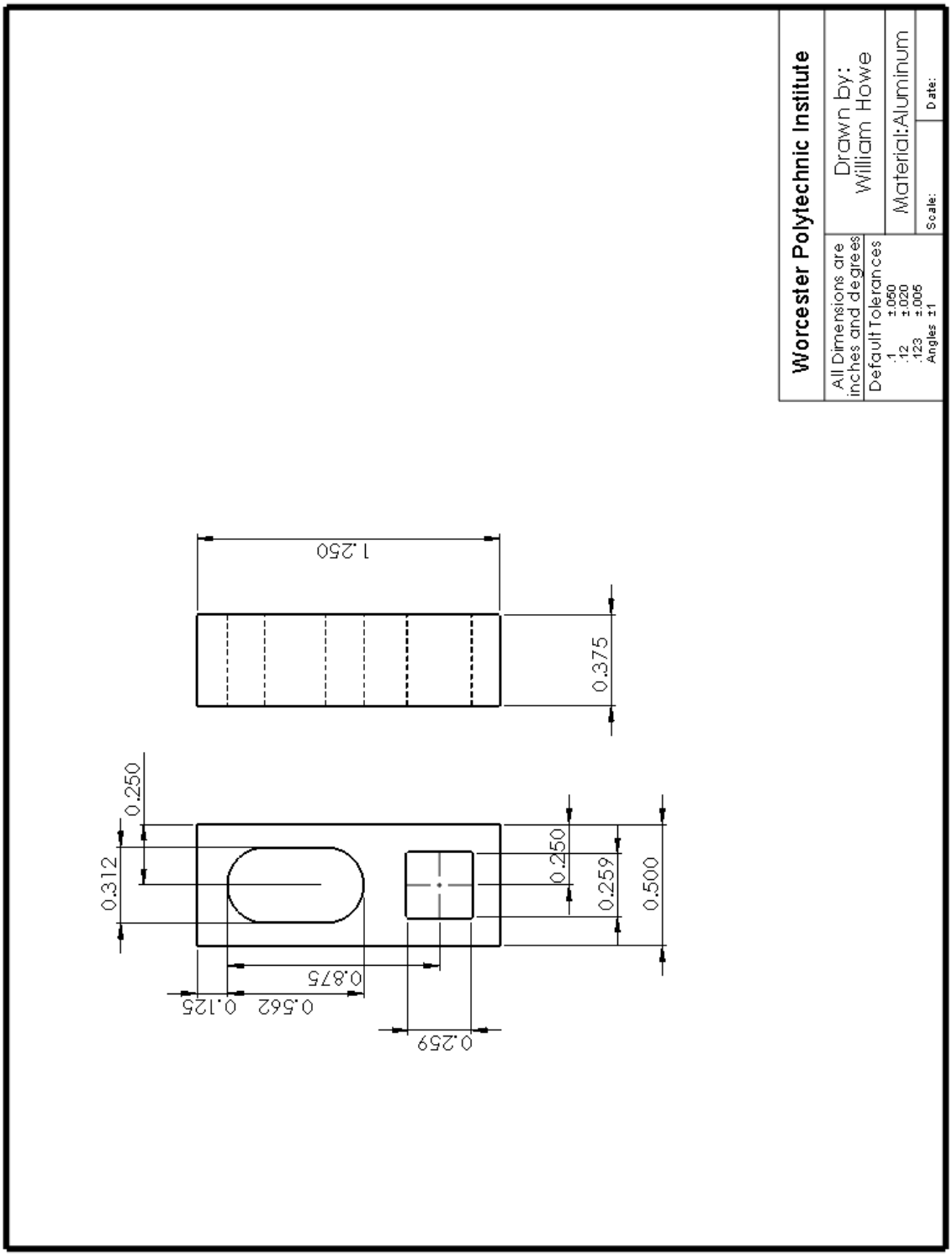

Figure 50 Connecting Link Drawing

A.4 MTG Bracket Drawing

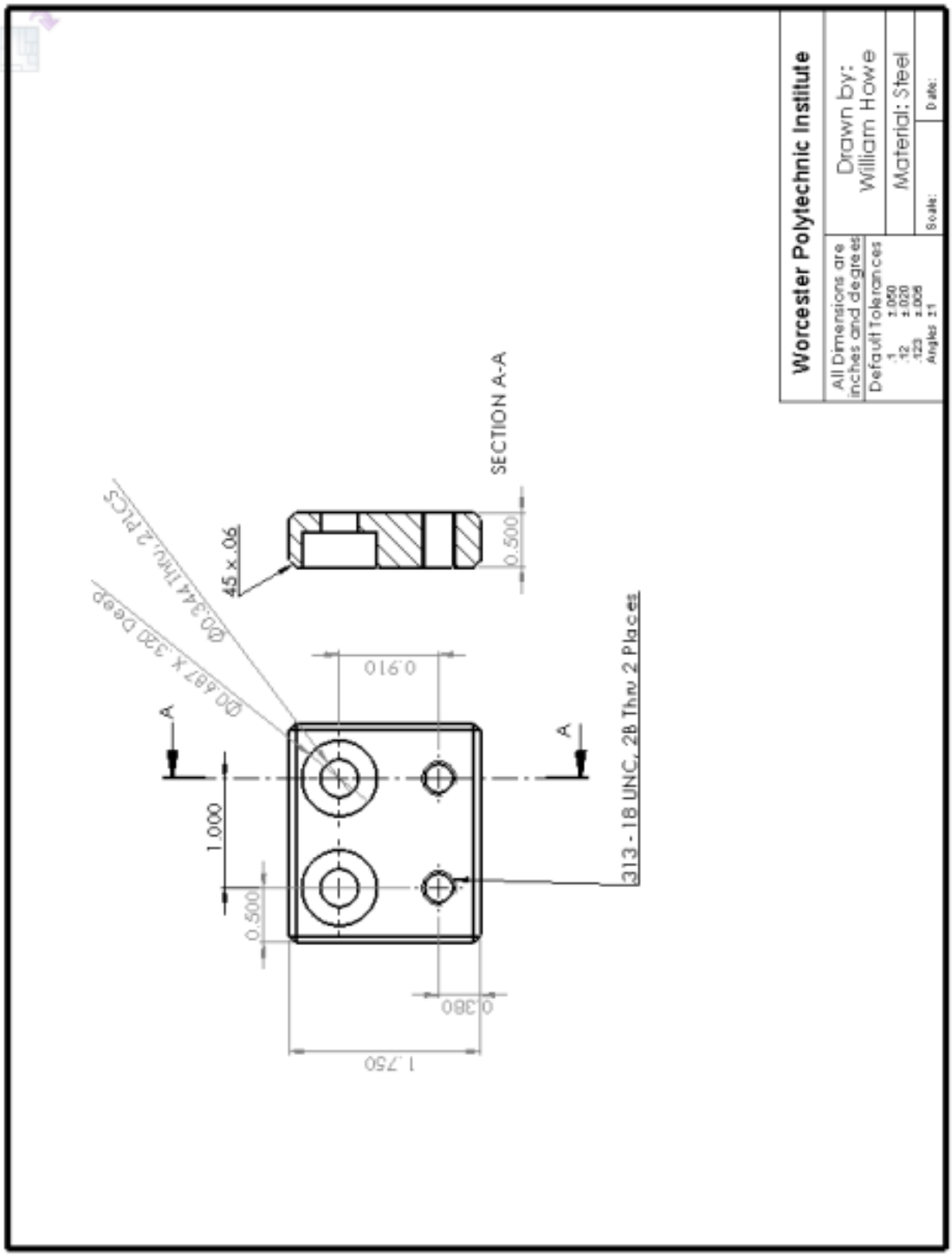

Figure 51 MTG Bracket Drawing

A.5 Connecting Link Fixture Drawing

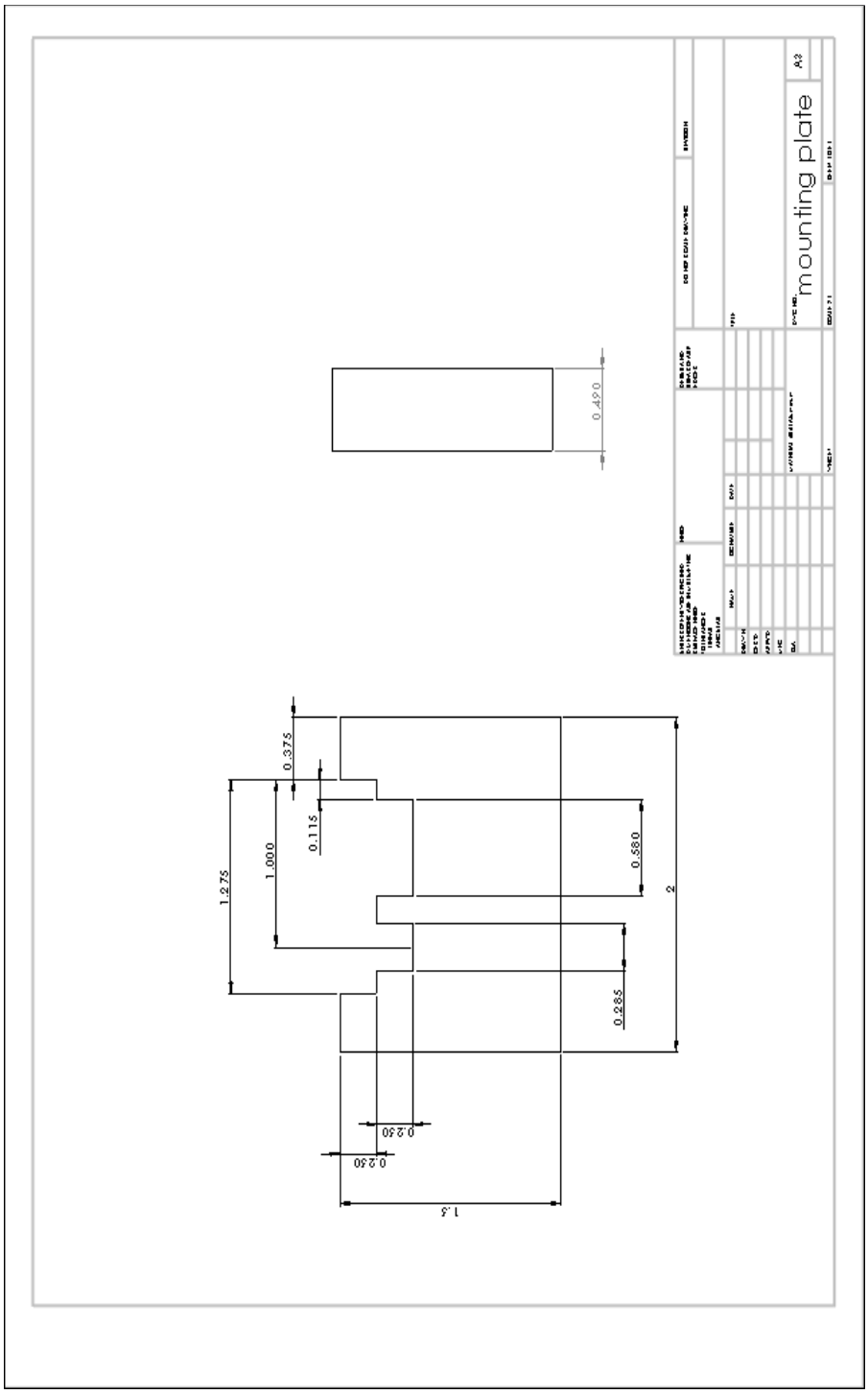

Figure 52 Connecting Link Fixture Drawing

A.6 Flange Drawing

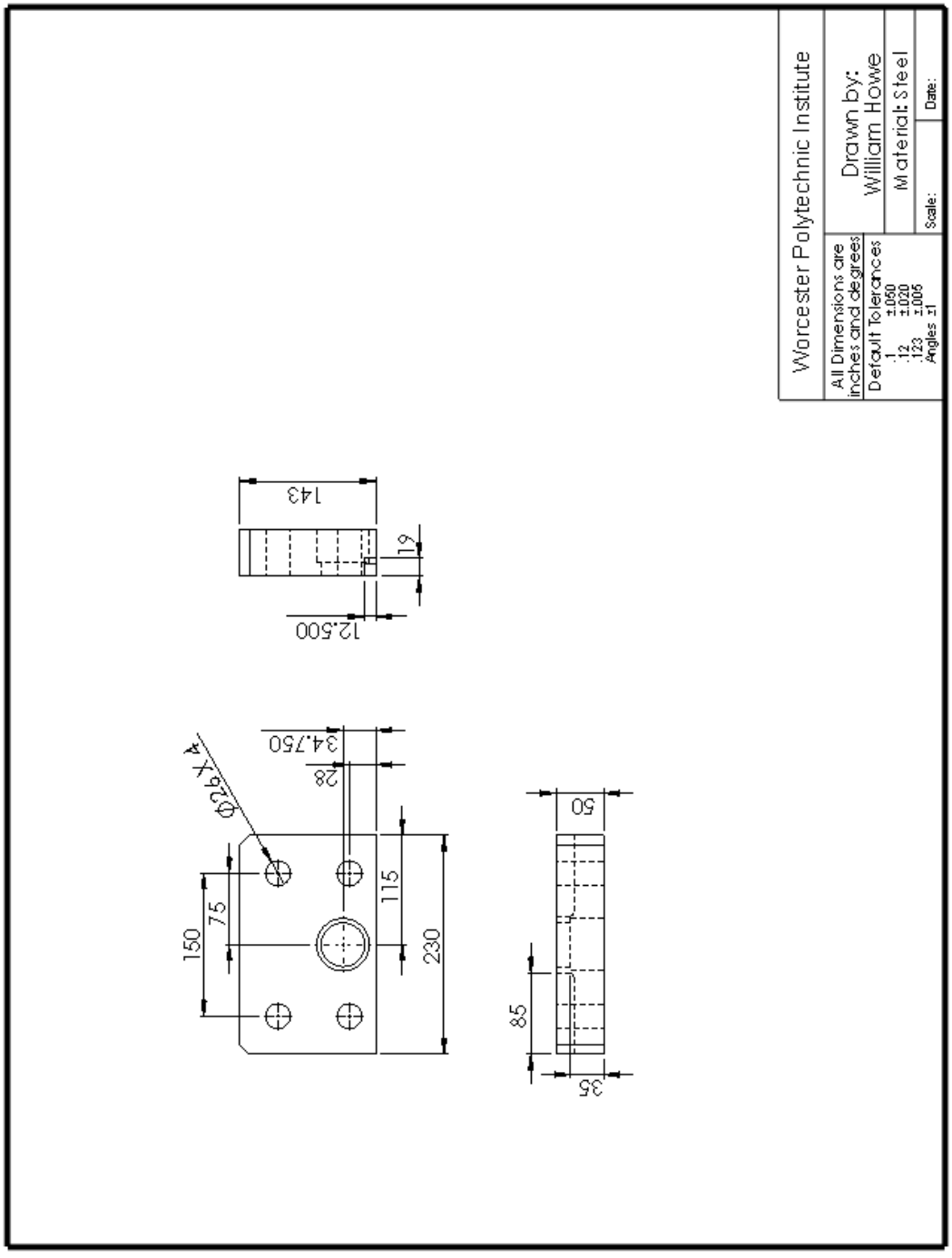

Figure 53 Flange Drawing

A.7 Manifold Drawing

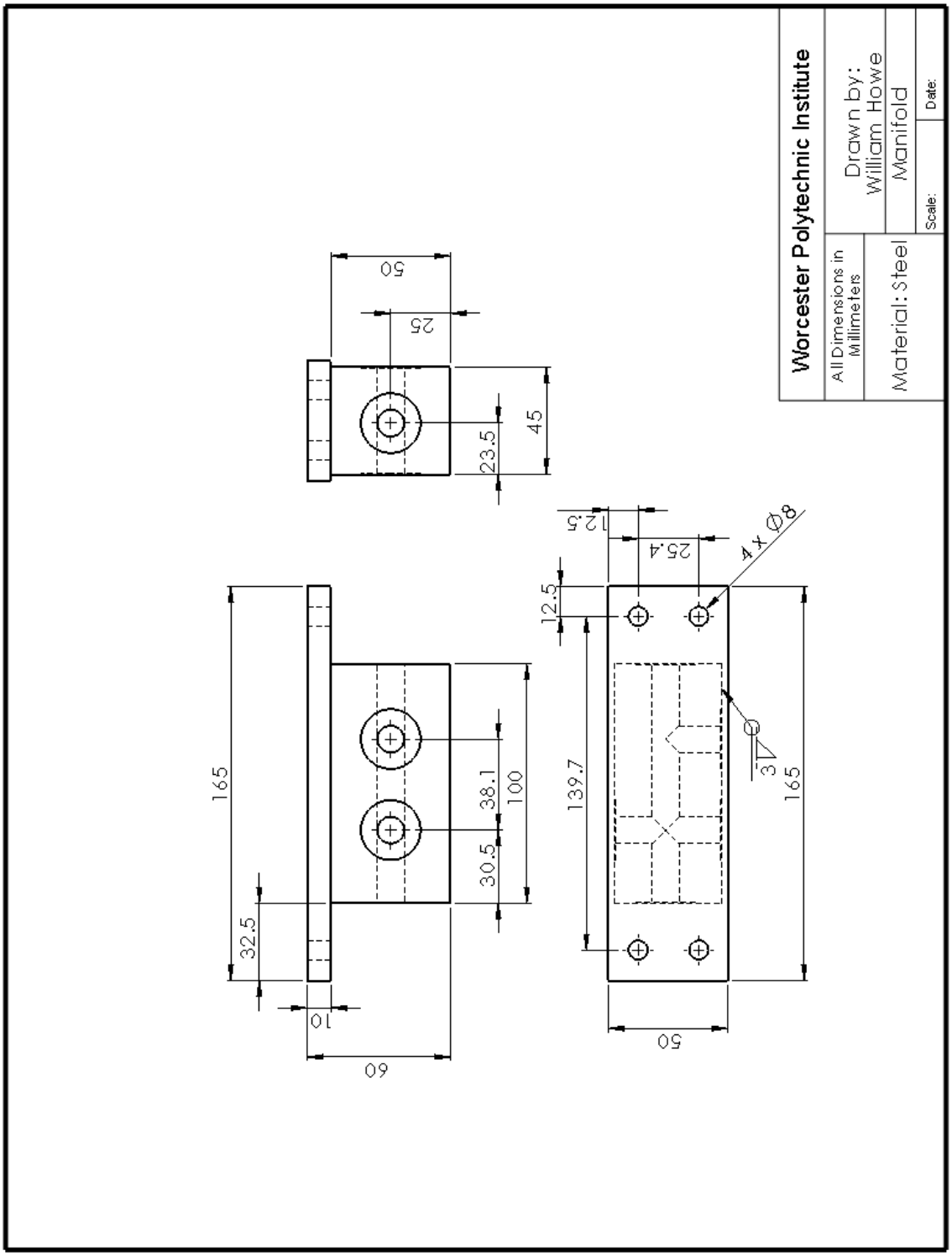

Figure 54 Manifold Drawing

Appendix B – Standard Tolerance Tolerance Block (from MMS40073)

Table 1a - General Tolerance – Linear and Radii Dimensions, (mm)

# of decimal places	drawing indication	Length of dimension						
		over		6	30	125	380	1000
		to	6	30	125	380	1000	
1	x,x		±0,25	±0,40	±0,50	±1,00	±1,50	±2,50
2	x,xx		±0,10	±0,15	±0,20	±0,40	±0,60	±1,00

Figure 55 General Tolerance Block

Appendix C – NC Code

C.1 Manifold Plate - Setup 1

```
O0001 (Manifold Plate Setup 1)
(HAAS VF2 Toby Working)
(1/7/2011 4:20:16 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T03 M06
N00004 G43 H03 M08
N00005 S4000
N00006 M03
N00007 G00 X-4.848 Y0 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-4.848 Y0
N00011 G01 Z-.025 F18.
N00012 X4.848 F36.
N00013 Z.075 F18.
N00014 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL DR 0.048 in )
(Virtual Tool Cnange)
(No Approach Move)
N00015 M05
N00016 M09
N00017 G00 G40 G49 G80 G90
N00018 T05 M06
N00020 G43 H05 M08
N00021 S3000
N00022 M03
N00023 G00 X2.7559 Y-.5079 (MOVE TO
FIRST X AND Y LOCATION)
(START OF OPERATION:  Center Drill )
N00024 G00 G54 (Assuming G54)
N00025 X2.7559 Y-.5079
N00026 Z.1
N00027 G81 G98 Z-.3112 R.1 F5.
N00028 Y.4921
N00029 X-2.7441
N00030 Y-.5079
N00031 G80
(TOOLCHANGE)
(CHANGING TO TOOL DR 08 )
(Virtual Tool Cnange)
(No Approach Move)
N00032 M05
N00033 M09
N00034 G00 G40 G49 G80 G90
N00035 T06 M06
N00037 G43 H06 M08
N00038 S3638
N00039 M03
N00040 G00 X2.7559 Y-.5079 (MOVE TO
FIRST X AND Y LOCATION)
(START OF OPERATION:  8 mm drill )
N00041 G00 G54 (Assuming G54)
N00042 X2.7559 Y-.5079
N00043 Z.1
N00044 G98 G83 X2.7559 Y-.5079 Z-.5734
R.1 Q.05 F25.47 P0
N00045 Y.4921
N00046 X-2.7441
N00047 Y-.5079
N00048 G80
(LAST TOOLCHANGE)
(CHANGING TO TOOL EMF 0.5 in )
(No Approach Move)
N00049 M05
N00050 M09
N00051 G00 G40 G49 G80 G90
N00052 T04 M06
N00054 G43 H04 M08
N00055 S4000
```

```
N00056 M03
N00057 G00 X3.498 Y.9843 (MOVE TO FIRST
X AND Y LOCATION)
(START OF OPERATION:  Contouring Finish
Pass )
N00058 G00 G54 (Assuming G54)
N00059 X3.498 Y.9843
N00060 Z.1
N00061 G01 Z-.1 F10.96
N00062 Y-.9843 F44.
N00063 G00 Z.1
N00064 Y.9843
N00065 G01 Z-.2 F10.96
N00066 Y-.9843 F44.
N00067 G00 Z.1
N00068 Y.9843
N00069 G01 Z-.3 F10.96
N00070 Y-.9843 F44.
N00071 G00 Z.1
N00072 Y.9843
N00073 G01 Z-.4 F10.96
N00074 Y-.9843 F44.
N00075 G00 Z.1
N00076 Y.9843
N00077 G01 Z-.5 F10.96
N00078 Y-.9843 F44.
N00079 G00 Z.1
N00080 Y.9843
N00081 G01 Z-.55 F10.96
N00082 Y-.9843 F44.
N00083 G00 Z.1
N00084 G00 Z.1
N00085 G00 G90
N00086 G00 G53 Z0.0
N00087 G00 G53 X-15. Y0.
N00088 M30
%
```

C.2 Manifold Plate - Setup 2

```
%
O0001 (Manifold Plate Setup 2)
(HAAS VF2 Toby Working)
(1/7/2011 4:21:15 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T03 M06
N00004 G43 H03 M08
N00005 S4000
N00006 M03
N00007 G00 X-4.848 Y0 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-4.848 Y0
N00011 G01 Z-.025 F18.
N00012 X4.848 F36.
N00013 Z.075 F18.
N00014 G00 Z.1
N00015 G00 Z.1
N00016 G00 G90
N00017 G00 G53 Z0.0
N00018 G00 G53 X-15. Y0.
N00019 M30
%
```

C.3 Manifold Block – Setup 1 and 2

```
%
O0001 (Manifold Block Setup 1 and 2 )
(HAAS VF2 Toby Working)
(12/16/2010 3:22:37 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M08
N00005 S4000
N00006 M03
N00007 G00 X-4.4685 Y0 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-4.4685 Y0
N00011 G01 Z-.0462 F24.
N00012 X4.4685 F36.
N00013 Z.0538 F24.
N00014 G00 X-4.4685
N00015 G01 Z-.0923
N00016 X4.4685 F36.
N00017 Z.0077 F24.
N00018 G00 X-4.4685
N00019 G01 Z-.1385
N00020 X4.4685 F36.
N00021 Z-.0385 F24.
N00022 G00 X-4.4685
N00023 G01 Z-.1847
N00024 X4.4685 F36.
N00025 Z-.0847 F24.
N00026 G00 X-4.4685
N00027 G01 Z-.2308
N00028 X4.4685 F36.
N00029 Z-.1308 F24.
N00030 G00 X-4.4685
N00031 G01 Z-.277
N00032 X4.4685 F36.
N00033 Z-.177 F24.
N00034 G00 Z.1
N00035 G00 Z.1
N00036 G00 G90
N00037 G00 G53 Z0.0
N00038 G00 G53 X-15. Y0.
N00039 M30
%
```

C.4 Manifold Block – Setup 3 and 4

```
%

O0001 (Manifold Block Setup 3 and 4)
(HAAS VF2 Toby Working)
(12/16/2010 3:30:22 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in)
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M08
N00005 S4000
N00006 M03
N00007 G00 X0 Y-2.9843 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X0 Y-2.9843
N00011 G01 Z-.032 F9.
N00012 Y2.9843 F36.
N00013 Z.0681 F9.
N00014 G00 Y-2.9843
N00015 G01 Z-.0639
N00016 Y2.9843 F36.
N00017 Z.0361 F9.
N00018 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL DR 0.03125 in )
(Virtual Tool Cnange)
(No Approach Move)
N00019 M05
N00020 M09
N00021 G00 G40 G49 G80 G90
N00022 T03 M06
N00024 G43 H03 M08
N00025 S3000
N00026 M03
N00027 G00 X.0394 Y0 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  Center Drill )
N00028 G00 G54 (Assuming G54)
N00029 X.0394 Y0
N00030 Z.1
N00031 G81 G98 Z-.1008 R.1 F5.
N00032 G80
(TOOLCHANGE)
(CHANGING TO TOOL 11.2 mm long drill )
(Virtual Tool Cnange)
(No Approach Move)
N00033 M05
N00034 M09
N00035 G00 G40 G49 G80 G90
N00036 T04 M06
N00038 G43 H04 M08
N00039 S300
N00040 M03
N00041 G00 X.0394 Y0 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  7/16 Drill )
N00042 G00 G54 (Assuming G54)
N00043 X.0394 Y0
N00044 Z.1
N00045 G98 G83 X.0394 Y0 Z-2.446 R.1
Q.05 F3.5 P0
N00046 G80
(LAST TOOLCHANGE)
(CHANGING TO TOOL EMF 0.375 in )
(No Approach Move)
N00047 M05
N00048 M09
N00049 G00 G40 G49 G80 G90
N00050 T02 M06
N00052 G43 H02 M08
N00053 S4000
N00054 M03
N00055 G00 X.0627 Y0 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  counterbore )
N00056 G00 G54 (Assuming G54)
N00057 X.0627 Y0
N00058 Z.0803
```

```
N00059 Z.0203
N00060 G01 Z-.0877 F7.
N00061 G03 X.0627 Y0 I-.0233 J0 F28.
N00062 X-.0309 Y0 I-.0468 J0
N00063 X.1565 Y0 I.0937 J0
N00064 X-.1246 Y0 I-.1406 J0
N00065 X.2502 Y0 I.1874 J0
N00066 X-.2184 Y0 I-.2343 J0
N00067 X.344 Y0 I.2812 J0
N00068 X.344 Y0 I-.3046 J0
N00069 G01 X.244
N00070 G00 Z.0803
N00071 X.0627
N00072 Z.0123
N00073 G01 Z-.0956 F7.
N00074 G03 X.0627 Y0 I-.0233 J0 F28.
N00075 X-.0309 Y0 I-.0468 J0
N00076 X.1565 Y0 I.0937 J0
N00077 X-.1246 Y0 I-.1406 J0
N00078 X.2502 Y0 I.1874 J0
N00079 X-.2184 Y0 I-.2343 J0
N00080 X.344 Y0 I.2812 J0
N00081 X.344 Y0 I-.3046 J0
N00082 G01 X.244
N00083 G00 Z.0803
N00084 X.0627
N00085 Z.0044
N00086 G01 Z-.1036 F7.
N00087 G03 X.0627 Y0 I-.0233 J0 F28.
N00088 X-.0309 Y0 I-.0468 J0
N00089 X.1565 Y0 I.0937 J0
N00090 X-.1246 Y0 I-.1406 J0
N00091 X.2502 Y0 I.1874 J0
N00092 X-.2184 Y0 I-.2343 J0
N00093 X.344 Y0 I.2812 J0
N00094 X.344 Y0 I-.3046 J0
N00095 G01 X.244
N00096 G00 Z.0803
N00097 G00 Z.0803
N00098 G00 G90
N00099 G00 G53 Z0.0
N00100 G00 G53 X-15. Y0.
N00101 M30
%
```

C.5 Manifold Block – Setup 5

```
%
O0001 (Manifold Block Setup 5)
(HAAS VF2 Toby Working)
(12/16/2010 3:50:05 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M08
N00005 S4000
N00006 M03
N00007 G00 X-3.9685 Y0 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-3.9685 Y0
N00011 G01 Z-.039 F24.
N00012 X3.9685 F36.
N00013 Z.061 F24.
N00014 G00 X-3.9685
N00015 G01 Z-.078
N00016 X3.9685 F36.
N00017 Z.022 F24.
N00018 G00 X-3.9685
N00019 G01 Z-.117
N00020 X3.9685 F36.
N00021 Z-.017 F24.
N00022 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL DR 0.03125 in )
(Virtual Tool Cnange)
(No Approach Move)
N00023 M05
N00024 M09
N00025 G00 G40 G49 G80 G90
N00026 T03 M06
N00028 G43 H03 M08
N00029 S3000
N00030 M03
N00031 G00 X-.7677 Y0 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION:  center drill )
N00032 G00 G54 (Assuming G54)
N00033 X-.7677 Y0
N00034 Z.1
N00035 G81 G98 Z-.1473 R-.01 F5.
N00036 G80
N00037 G00 Z.1
N00038 G81 G98 X.7323 Z-.1473 R-.01 F5.
N00039 G80
N00040 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL 11.2 mm long drill )
(Virtual Tool Cnange)
(No Approach Move)
N00041 M05
N00042 M09
N00043 G00 G40 G49 G80 G90
N00044 T04 M06
N00046 G43 H04 M08
N00047 S350
N00048 M03
N00049 G00 X-.7677 Y0 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION:  11.2 mm drill )
N00050 G00 G54 (Assuming G54)
N00051 X-.7677 Y0
N00052 Z.1
N00053 G98 G83 X-.7677 Y0 Z-1.2725 R0 Q.1 F4. P0
N00054 G80
N00055 G00 Z.1
N00056 G98 G83 X.7323 Y0 Z-1.2725 R0 Q.1 F4. P0
N00057 G80
N00058 G00 Z.1
(LAST TOOLCHANGE)
(CHANGING TO TOOL EM 0.375 in )
(No Approach Move)
N00059 M05
N00060 M09
```

N00061 G00 G40 G49 G80 G90
N00062 T02 M06
N00064 G43 H02 M08
N00065 S4000
N00066 M03
N00067 G00 X.7557 Y0 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION: SolidMill - Pocketing)
N00068 G00 G54 (Assuming G54)
N00069 X.7557 Y0
N00070 Z.0803
N00071 Z-.0297
N00072 G01 Z-.1387 F7.
N00073 G03 X.7557 Y0 I-.0234 J0 F28.
N00074 X.662 Y0 I-.0469 J0
N00075 X.8494 Y0 I.0937 J0
N00076 X.5683 Y0 I-.1406 J0
N00077 X.9432 Y0 I.1874 J0
N00078 X.4745 Y0 I-.2344 J0
N00079 X1.0369 Y0 I.2812 J0
N00080 X1.0369 Y0 I-.3046 J0
N00081 G01 X.9369 Z-.0387
N00082 G00 Z.0803
N00083 X.7557
N00084 Z-.0387
N00085 G01 Z-.1477 F7.
N00086 G03 X.7557 Y0 I-.0234 J0 F28.
N00087 X.662 Y0 I-.0469 J0
N00088 X.8494 Y0 I.0937 J0
N00089 X.5683 Y0 I-.1406 J0
N00090 X.9432 Y0 I.1874 J0
N00091 X.4745 Y0 I-.2344 J0
N00092 X1.0369 Y0 I.2812 J0
N00093 X1.0369 Y0 I-.3046 J0
N00094 G01 X.9369 Z-.0477
N00095 G00 Z.0803
N00096 X.7557
N00097 Z-.0477
N00098 G01 Z-.1567 F7.
N00099 G03 X.7557 Y0 I-.0234 J0 F28.
N00100 X.662 Y0 I-.0469 J0
N00101 X.8494 Y0 I.0937 J0
N00102 X.5683 Y0 I-.1406 J0
N00103 X.9432 Y0 I.1874 J0
N00104 X.4745 Y0 I-.2344 J0
N00105 X1.0369 Y0 I.2812 J0
N00106 X1.0369 Y0 I-.3046 J0
N00107 G01 X.9369 Z-.0567
N00108 G00 Z.0803
(START OF OPERATION: SolidMill - Pocketing)
N00109 G00 G54 (Assuming G54)
N00110 X-.7443 Y0
N00111 Z.0803
N00112 Z-.0297
N00113 G01 Z-.1387 F7.
N00114 G03 X-.7443 Y0 I-.0234 J0 F28.
N00115 X-.838 Y0 I-.0469 J0
N00116 X-.6506 Y0 I.0937 J0
N00117 X-.9317 Y0 I-.1406 J0
N00118 X-.5568 Y0 I.1874 J0
N00119 X-1.0255 Y0 I-.2344 J0
N00120 X-.4631 Y0 I.2812 J0
N00121 X-.4631 Y0 I-.3046 J0
N00122 G01 X-.5631 Z-.0387
N00123 G00 Z.0803
N00124 X-.7443
N00125 Z-.0387
N00126 G01 Z-.1477 F7.
N00127 G03 X-.7443 Y0 I-.0234 J0 F28.
N00128 X-.838 Y0 I-.0469 J0
N00129 X-.6506 Y0 I.0937 J0
N00130 X-.9317 Y0 I-.1406 J0
N00131 X-.5568 Y0 I.1874 J0
N00132 X-1.0255 Y0 I-.2344 J0
N00133 X-.4631 Y0 I.2812 J0
N00134 X-.4631 Y0 I-.3046 J0
N00135 G01 X-.5631 Z-.0477
N00136 G00 Z.0803
N00137 X-.7443
N00138 Z-.0477
N00139 G01 Z-.1567 F7.
N00140 G03 X-.7443 Y0 I-.0234 J0 F28.
N00141 X-.838 Y0 I-.0469 J0
N00142 X-.6506 Y0 I.0937 J0
N00143 X-.9317 Y0 I-.1406 J0
N00144 X-.5568 Y0 I.1874 J0

```
N00145 X-1.0255 Y0 I-.2344 J0
N00146 X-.4631 Y0 I.2812 J0
N00147 X-.4631 Y0 I-.3046 J0
N00148 G01 X-.5631 Z-.0567
N00149 G00 Z.0803
N00150 G00 Z.0803
N00151 G00 G90
N00152 G00 G53 Z0.0
N00153 G00 G53 X-15. Y0.
N00154 M30
%
```

C.6 Manifold Block - Setup 6

```
%
O0001 (Manifold Block Setup 6)
(HAAS VF2 Toby Working)
(12/16/2010 4:25:04 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M08
N00005 S4000
N00006 M03
N00007 G00 X-3.5685 Y0 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-3.5685 Y0
N00011 G01 Z-.039 F24.
N00012 X3.5685 F36.
N00013 Z.061 F24.
N00014 G00 X-3.5685
N00015 G01 Z-.078
N00016 X3.5685 F36.
N00017 Z.022 F24.
N00018 G00 X-3.5685
N00019 G01 Z-.117
N00020 X3.5685 F36.
N00021 Z-.017 F24.
N00022 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL Center Drill )
(Virtual Tool Cnange)
(No Approach Move)
N00023 M05
N00024 M09
N00025 G00 G40 G49 G80 G90
N00026 T03 M06
N00028 G43 H03 M08
N00029 S3000
N00030 M03
N00031 G00 X.7323 Y0 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  center drill )
N00032 G00 G54 (Assuming G54)
N00033 X.7323 Y0
N00034 Z.1
N00035 G81 G98 Z-.1473 R-.014 F5.
N00036 G80
N00037 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL 11.2 mm long drill )
(Virtual Tool Cnange)
(No Approach Move)
N00038 M05
N00039 M09
N00040 G00 G40 G49 G80 G90
N00041 T04 M06
N00043 G43 H04 M08
N00044 S325
N00045 M03
N00046 G00 X.7323 Y0 (MOVE TO FIRST X
AND Y LOCATION)
(START OF OPERATION:  11.2 mm drill )
N00047 G00 G54 (Assuming G54)
N00048 X.7323 Y0
N00049 Z.1
N00050 G98 G83 X.7323 Y0 Z-1.1575 R0
Q.075 F4. P0
N00051 G80
N00052 G00 Z.1
(LAST TOOLCHANGE)
(CHANGING TO TOOL EM 0.375 in )
(No Approach Move)
N00053 M05
N00054 M09
N00055 G00 G40 G49 G80 G90
N00056 T02 M06
N00058 G43 H02 M08
N00059 S4000
N00060 M03
N00061 G00 X.7557 Y0 (MOVE TO FIRST X
AND Y LOCATION)
```

```
(START OF OPERATION:  SolidMill - Pocketing )
N00062 G00 G54 (Assuming G54)
N00063 X.7557 Y0
N00064 Z.0803
N00065 Z-.0337
N00066 G01 Z-.1452 F7.
N00067 G03 X.7557 Y0 I-.0234 J0 F28.
N00068 X.662 Y0 I-.0469 J0
N00069 X.8494 Y0 I.0937 J0
N00070 X.5683 Y0 I-.1406 J0
N00071 X.9432 Y0 I.1874 J0
N00072 X.4745 Y0 I-.2344 J0
N00073 X1.0369 Y0 I.2812 J0
N00074 X1.0369 Y0 I-.3046 J0
N00075 G01 X.9369 Z-.0452
N00076 G00 Z.0803
N00077 X.7557
N00078 Z-.0452
N00079 G01 Z-.1567 F7.
N00080 G03 X.7557 Y0 I-.0234 J0 F28.
N00081 X.662 Y0 I-.0469 J0
N00082 X.8494 Y0 I.0937 J0
N00083 X.5683 Y0 I-.1406 J0
N00084 X.9432 Y0 I.1874 J0
N00085 X.4745 Y0 I-.2344 J0
N00086 X1.0369 Y0 I.2812 J0
N00087 X1.0369 Y0 I-.3046 J0
N00088 G01 X.9369 Z-.0567
N00089 G00 Z.0803
N00090 G00 Z.0803
N00091 G00 G90
N00092 G00 G53 Z0.0
N00093 G00 G53 X-15. Y0.
N00094 M30
```

C.7 Flange – Setup 1 and 2

```
%
O0001 (Flange Setup 1 and 2)
(HAAS VF2 Toby Working)
(1/7/2011 4:28:07 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M08
N00005 S4000
N00006 M03
N00007 G00 X-5.815 Y.0003 (MOVE TO
FIRST X AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-5.815 Y.0003
N00011 G01 Z-.07 F9.
N00012 X5.4213 F36.
N00013 Z.03 F9.
N00014 G00 X-5.815
N00015 G01 Z-.14
N00016 X5.4213 F36.
N00017 Z-.04 F9.
N00018 G00 X-5.815
N00019 G01 Z-.21
N00020 X5.4213 F36.
N00021 Z-.11 F9.
N00022 G00 X-5.815
N00023 G01 Z-.28
N00024 X5.4213 F36.
N00025 Z-.18 F9.
N00026 G00 X-5.815
N00027 G01 Z-.35
N00028 X5.4213 F36.
N00029 Z-.25 F9.
N00030 G00 Z.1
N00031 G00 Z.1
N00032 G00 G90
N00033 G00 G53 Z0.0
N00034 G00 G53 X-15. Y0.
N00035 M30
%
```

C.8 Flange – Setup 3

```
%
O0001 (Flange Setup 3)
(HAAS VF2 Toby Working)
(1/7/2011 4:29:11 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M08
N00005 S4000
N00006 M03
N00007 G00 X-7.1343 Y.0003 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-7.1343 Y.0003
N00011 G01 Z-.05 F9.
N00012 X7.1334 F36.
N00013 Z.05 F9.
N00014 G00 Z.1
N00015 G00 Z.1
N00016 G00 G90
N00017 G00 G53 Z0.0
N00018 G00 G53 X-15. Y0.
N00019 M30
%
```

C.9 Flange – Setup 4

```
%
O0001 (Flange Setup 4)
(HAAS VF2 Toby Working)
(1/7/2011 4:30:34 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M09
N00005 S4000
N00006 M03
N00007 G00 X-6.128 Y-.0003 (MOVE TO
FIRST X AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-6.128 Y-.0003
N00011 G01 Z-.0489 F9.
N00012 X6.1271 F36.
N00013 Z.0511 F9.
N00014 G00 X-6.128
N00015 G01 Z-.0978
N00016 X6.1271 F36.
N00017 Z.0022 F9.
N00018 G00 X-6.128
N00019 G01 Z-.1467
N00020 X6.1271 F36.
N00021 Z-.0467 F9.
N00022 G00 X-6.128
N00023 G01 Z-.1956
N00024 X6.1271 F36.
N00025 Z-.0956 F9.
N00026 G00 X-6.128
N00027 G01 Z-.2445
N00028 X6.1271 F36.
N00029 Z-.1445 F9.
N00030 G00 X-6.128
N00031 G01 Z-.2934
N00032 X6.1271 F36.
N00033 Z-.1934 F9.
N00034 G00 X-6.128
N00035 G01 Z-.3423
N00036 X6.1271 F36.
N00037 Z-.2423 F9.
N00038 G00 X-6.128
N00039 G01 Z-.3911
N00040 X6.1271 F36.
N00041 Z-.2911 F9.
N00042 G00 X-6.128
N00043 G01 Z-.44
N00044 X6.1271 F36.
N00045 Z-.34 F9.
N00046 G00 X-6.128
N00047 G01 Z-.4889
N00048 X6.1271 F36.
N00049 Z-.3889 F9.
N00050 G00 X-6.128
N00051 G01 Z-.5378
N00052 X6.1271 F36.
N00053 Z-.4378 F9.
N00054 G00 X-6.128
N00055 G01 Z-.5867
N00056 X6.1271 F36.
N00057 Z-.4867 F9.
N00058 G00 X-6.128
N00059 G01 Z-.6356
N00060 X6.1271 F36.
N00061 Z-.5356 F9.
N00062 G00 X-6.128
N00063 G01 Z-.6845
N00064 X6.1271 F36.
N00065 Z-.5845 F9.
N00066 G00 X-6.128
N00067 G01 Z-.7334
N00068 X6.1271 F36.
N00069 Z-.6334 F9.
N00070 G00 X-6.128
N00071 G01 Z-.7823
N00072 X6.1271 F36.
N00073 Z-.6823 F9.
N00074 G00 X-6.128
N00075 G01 Z-.8312
```

N00076 X6.1271 F36.
N00077 Z-.7312 F9.
N00078 G00 X-6.128
N00079 G01 Z-.8801
N00080 X6.1271 F36.
N00081 Z-.7801 F9.
N00082 G00 X-6.128
N00083 G01 Z-.929
N00084 X6.1271 F36.
N00085 Z-.829 F9.
N00086 G00 X-6.128
N00087 G01 Z-.9779
N00088 X6.1271 F36.
N00089 Z-.8779 F9.
N00090 G00 X-6.128
N00091 G01 Z-1.0268
N00092 X6.1271 F36.
N00093 Z-.9268 F9.
N00094 G00 X-6.128
N00095 G01 Z-1.0757
N00096 X6.1271 F36.
N00097 Z-.9757 F9.
N00098 G00 X-6.128
N00099 G01 Z-1.1246
N00100 X6.1271 F36.
N00101 Z-1.0246 F9.
N00102 G00 X-6.128
N00103 G01 Z-1.1734
N00104 X6.1271 F36.
N00105 Z-1.0734 F9.
N00106 G00 X-6.128
N00107 G01 Z-1.2223
N00108 X6.1271 F36.
N00109 Z-1.1223 F9.
N00110 G00 X-6.128
N00111 G01 Z-1.2712
N00112 X6.1271 F36.
N00113 Z-1.1712 F9.
N00114 G00 X-6.128
N00115 G01 Z-1.3201
N00116 X6.1271 F36.
N00117 Z-1.2201 F9.
N00118 G00 X-6.128
N00119 G01 Z-1.369
N00120 X6.1271 F36.
N00121 Z-1.269 F9.
N00122 G00 X-6.128
N00123 G01 Z-1.4179
N00124 X6.1271 F36.
N00125 Z-1.3179 F9.
N00126 G00 X-6.128
N00127 G01 Z-1.4668
N00128 X6.1271 F36.
N00129 Z-1.3668 F9.
N00130 G00 X-6.128
N00131 G01 Z-1.5157
N00132 X6.1271 F36.
N00133 Z-1.4157 F9.
N00134 G00 Z.1
(LAST TOOLCHANGE)
(CHANGING TO TOOL EM 0.375 in)
(No Approach Move)
N00135 M05
N00136 M09
N00137 G00 G40 G49 G80 G90
N00138 T02 M06
N00140 G43 H02 M08
N00141 S4000
N00142 M03
N00143 G00 X-1.1822 Y1.3903 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION: SolidMill - Trochoidal Pocketing)
N00144 G00 G54 (Assuming G54)
N00145 X-1.1822 Y1.3903
N00146 Z.1
N00147 Z-1.4
N00148 G01 Z-1.5462 F7.
N00149 X-1.1829 Y1.1903 F28.
N00150 G03 X-1.1822 Y1.1895 I0 J-.0008
N00151 G01 X-1.1831 Y1.1902 F56.
N00152 G03 X-1.1822 Y1.1894 I-.0001 J-.001 F28.
N00153 G01 X-1.1834 Y1.1902 F56.
N00154 G03 X-1.1822 Y1.1891 I-.0002 J-.0013 F28.
N00155 G01 X-1.1838 Y1.1902 F56.

N00156 G03 X-1.1822 Y1.1886 I-.0003 J-.0019 F28.
N00157 G01 X-1.1845 Y1.1902 F56.
N00158 G03 X-1.1822 Y1.188 I-.0004 J-.0026 F28.
N00159 G01 X-1.1853 Y1.1902 F56.
N00160 G03 X-1.1822 Y1.1872 I-.0005 J-.0035 F28.
N00161 G01 X-1.1864 Y1.1902 F56.
N00162 G03 X-1.1822 Y1.1861 I-.0007 J-.0048 F28.
N00163 G01 X-1.1879 Y1.1902 F56.
N00164 G03 X-1.1823 Y1.1845 I-.001 J-.0066 F28.
N00165 G01 X-1.1899 Y1.1902 F56.
N00166 G03 X-1.1823 Y1.1825 I-.0012 J-.0088 F28.
N00167 G01 X-1.1924 Y1.1901 F56.
N00168 G03 X-1.1823 Y1.18 I-.0016 J-.0116 F28.
N00169 G01 X-1.1956 Y1.1901 F56.
N00170 G03 X-1.1823 Y1.1768 I-.0019 J-.0152 F28.
N00171 G01 X-1.1998 Y1.1901 F56.
N00172 G03 X-1.1824 Y1.1726 I-.0027 J-.0202 F28.
N00173 G01 X-1.2051 Y1.1901 F56.
N00174 G03 X-1.1824 Y1.1673 I-.003 J-.0257 F28.
N00175 G01 X-1.2113 Y1.19 F56.
N00176 G03 X-1.1824 Y1.1611 I-.0037 J-.0325 F28.
N00177 G01 X-1.2188 Y1.19 F56.
N00178 G03 X-1.1824 Y1.1536 I-.0043 J-.0406 F28.
N00179 G01 X-1.228 Y1.1899 F56.
N00180 G03 X-1.1825 Y1.1444 I-.0056 J-.0511 F28.
N00181 G01 X-1.2391 Y1.19 F56.
N00182 G03 X-1.1825 Y1.1334 I-.006 J-.0627 F28.
N00183 G01 X-1.2516 Y1.1899 F56.
N00184 G03 X-1.1825 Y1.1209 I-.0071 J-.0761 F28.
N00185 G01 X-1.2654 Y1.1899 F56.
N00186 G03 X-1.1825 Y1.107 I-.0074 J-.0903 F28.
N00187 G01 X-1.2804 Y1.1899 F56.
N00188 G03 X-1.1825 Y1.0921 I-.0082 J-.106 F28.
N00189 G01 X-1.2967 Y1.1899 F56.
N00190 G03 X-1.1825 Y1.0757 I-.0089 J-.123 F28.
N00191 G01 X-1.3142 Y1.1899 F56.
N00192 G03 X-1.1825 Y1.0582 I-.0093 J-.141 F28.
N00193 G01 X-1.3333 Y1.1899 F56.
N00194 G03 X-1.1825 Y1.0391 I-.0106 J-.1613 F28.
N00195 G01 X-1.3537 Y1.1899 F56.
N00196 G03 X-1.1825 Y1.0187 I-.0105 J-.1816 F28.
N00197 G01 X-1.3746 Y1.19 F56.
N00198 G03 X-1.1825 Y.9978 I-.0111 J-.2032 F28.
N00199 G01 X-1.3963 Y1.19 F56.
N00200 G03 X-1.1825 Y.9761 I-.0112 J-.2251 F28.
N00201 G01 X-1.4192 Y1.1899 F56.
N00202 G03 X-1.1825 Y.9533 I-.0122 J-.2489 F28.
N00203 G01 X-1.4433 Y1.19 F56.
N00204 G03 X-1.1825 Y.9292 I-.0124 J-.2732 F28.
N00205 G01 X-1.4685 Y1.1899 F56.
N00206 G03 X-1.1825 Y.904 I-.0134 J-.2993 F28.
N00207 G01 X-1.4939 Y1.19 F56.
N00208 G03 X-1.1824 Y.8785 I-.0126 J-.324 F28.
N00209 G01 X-1.5197 Y1.19 F56.
N00210 G03 X-1.1825 Y.8527 I-.0138 J-.3511 F28.
N00211 G01 X-1.5468 Y1.19 F56.
N00212 G03 X-1.1824 Y.8256 I-.0138 J-.3781 F28.
N00213 G01 X-1.5606 Y1.1903
N00214 G03 X-1.1822 Y.8119 I0 J-.3784

N00215 G01 X-1.5933 Y1.1888 F56.
N00216 G03 X-1.5933 Y.4349 I-.0328 J-.3769 F28.
N00217 G01 X-1.6581 Y1.1889 F56.
N00218 G03 X-1.6581 Y.4348 I-.032 J-.377 F28.
N00219 G01 X-1.7239 Y1.1887 F56.
N00220 G03 X-1.7239 Y.435 I-.0339 J-.3768 F28.
N00221 G01 X-1.7907 Y1.1888 F56.
N00222 G03 X-1.7907 Y.4349 I-.033 J-.3769 F28.
N00223 G01 X-1.8583 Y1.1887 F56.
N00224 G03 X-1.8583 Y.4351 I-.0347 J-.3768 F28.
N00225 G01 X-1.9266 Y1.1887 F56.
N00226 G03 X-1.9266 Y.435 I-.0337 J-.3768 F28.
N00227 G01 X-1.9931 Y1.1888 F56.
N00228 G03 X-1.9931 Y.4349 I-.0327 J-.3769 F28.
N00229 G01 X-2.0577 Y1.1889 F56.
N00230 G03 X-2.0577 Y.4348 I-.0318 J-.377 F28.
N00231 G01 X-2.1227 Y1.1888 F56.
N00232 G03 X-2.1227 Y.4349 I-.0332 J-.3769 F28.
N00233 G01 X-2.1903 Y1.1887 F56.
N00234 G03 X-2.1903 Y.435 I-.0344 J-.3768 F28.
N00235 G01 X-2.258 Y1.1888 F56.
N00236 G03 X-2.258 Y.4349 I-.0333 J-.3769 F28.
N00237 G01 X-2.3235 Y1.1889 F56.
N00238 G03 X-2.3235 Y.4348 I-.0323 J-.377 F28.
N00239 G01 X-2.389 Y1.1888 F56.
N00240 G03 X-2.389 Y.4349 I-.0332 J-.3769 F28.
N00241 G01 X-2.4562 Y1.1887 F56.
N00242 G03 X-2.4562 Y.435 I-.034 J-.3768 F28.
N00243 G01 X-2.523 Y1.1888 F56.
N00244 G03 X-2.523 Y.4349 I-.0328 J-.3769 F28.
N00245 G01 X-2.5874 Y1.1889 F56.
N00246 G03 X-2.5874 Y.4348 I-.0317 J-.377 F28.
N00247 G01 X-2.653 Y1.1887 F56.
N00248 G03 X-2.653 Y.435 I-.0339 J-.3768 F28.
N00249 G01 X-2.7195 Y1.1888 F56.
N00250 G03 X-2.7195 Y.4349 I-.0326 J-.3769 F28.
N00251 G01 X-2.7865 Y1.1887 F56.
N00252 G03 X-2.7865 Y.435 I-.0345 J-.3768 F28.
N00253 G01 X-2.854 Y1.1888 F56.
N00254 G03 X-2.854 Y.4349 I-.033 J-.3769 F28.
N00255 G01 X-2.9214 Y1.1887 F56.
N00256 G03 X-2.9214 Y.435 I-.0344 J-.3768 F28.
N00257 G01 X-2.9886 Y1.1888 F56.
N00258 G03 X-2.9886 Y.4349 I-.0328 J-.3769 F28.
N00259 G01 X-3.0553 Y1.1887 F56.
N00260 G03 X-3.0553 Y.435 I-.0339 J-.3768 F28.
N00261 G01 X-3.1238 Y1.1887 F56.
N00262 G03 X-3.1238 Y.4351 I-.0347 J-.3768 F28.
N00263 G01 X-3.1912 Y1.1888 F56.
N00264 G03 X-3.1912 Y.4349 I-.0328 J-.3769 F28.
N00265 G01 X-3.2571 Y1.1888 F56.
N00266 G03 X-3.2571 Y.4349 I-.0332 J-.3769 F28.
N00267 G01 X-3.3236 Y1.1888 F56.
N00268 G03 X-3.3236 Y.4349 I-.0333 J-.3769 F28.
N00269 G01 X-3.39 Y1.1888 F56.
N00270 G03 X-3.39 Y.4349 I-.0332 J-.3769 F28.
N00271 G01 X-3.456 Y1.1888 F56.
N00272 G03 X-3.456 Y.4349 I-.0328 J-.3769 F28.

N00273 G01 X-3.5227 Y1.1887 F56.
N00274 G03 X-3.5227 Y.435 I-.0338 J-.3768 F28.
N00275 G01 X-3.5909 Y1.1887 F56.
N00276 G03 X-3.5909 Y.435 I-.0343 J-.3768 F28.
N00277 G01 X-3.6595 Y1.1887 F56.
N00278 G03 X-3.6595 Y.435 I-.0342 J-.3768 F28.
N00279 G01 X-3.7273 Y1.1888 F56.
N00280 G03 X-3.7273 Y.435 I-.0337 J-.3769 F28.
N00281 G01 X-3.7935 Y1.1888 F56.
N00282 G03 X-3.7935 Y.4349 I-.0325 J-.3769 F28.
N00283 G01 X-3.8591 Y1.1888 F56.
N00284 G03 X-3.8591 Y.4349 I-.0332 J-.3769 F28.
N00285 G01 X-3.9249 Y1.1888 F56.
N00286 G03 X-3.9249 Y.4349 I-.0326 J-.3769 F28.
N00287 G01 X-3.9917 Y1.1887 F56.
N00288 G03 X-3.9917 Y.435 I-.0342 J-.3768 F28.
N00289 G01 X-4.0594 Y1.1888 F56.
N00290 G03 X-4.0594 Y.435 I-.0335 J-.3769 F28.
N00291 G01 X-4.1258 Y1.1888 F56.
N00292 G03 X-4.1258 Y.4349 I-.0329 J-.3769 F28.
N00293 G01 X-4.1926 Y1.1887 F56.
N00294 G03 X-4.1926 Y.435 I-.0339 J-.3768 F28.
N00295 G01 X-4.2588 Y1.1889 F56.
N00296 G03 X-4.2588 Y.4349 I-.0324 J-.377 F28.
N00297 G01 X-4.3235 Y1.1889 F56.
N00298 G03 X-4.3235 Y.4349 I-.0324 J-.377 F28.
N00299 G01 X-4.3559 Y1.1903
N00300 G03 X-4.3559 Y.4335 I0 J-.3784
N00301 G01 X-4.4479 Y1.1789 F56.
N00302 G03 X-4.7229 Y.9039 I-.0693 J-.2057 F28.
N00303 G01 X-4.528 Y.984 F56.
N00304 X-4.3559 Y.8119
N00305 X-4.7222 Y.717
N00306 G03 X-4.4507 Y.4456 I.2008 J-.0707 F28.
N00307 G01 X-4.7171 Y.5627 F56.
N00308 G03 X-4.605 Y.4506 I.0627 J-.0494 F28.
N00309 G01 X-4.7343 Y.4335
N00310 X-4.3559 Y.8119 F56.
N00311 X-1.5606
N00312 X-1.4657 Y.4456
N00313 G03 X-1.1943 Y.717 I.0707 J.2007 F28.
N00314 G01 X-1.3114 Y.4506 F56.
N00315 G03 X-1.1993 Y.5627 I.0494 J.0627 F28.
N00316 G01 X-1.1822 Y.4335
N00317 X-1.1953 Y.5326 Z-1.4462
N00318 G00 Z.1
N00319 X-4.7109 Y.4568
N00320 Z-1.4
N00321 G01 Z-1.5462 F7.
N00322 X-4.7343 Y.4335 F28.
N00323 X-1.1822
N00324 Y1.1903
N00325 X-2.7563
N00326 X-4.528
N00327 G03 X-4.7343 Y.984 I0 J-.2063
N00328 G01 Y.4335
N00329 Z-1.4462 F7.
N00330 G00 Z.1
N00331 X-1.1822 Y1.3903
N00332 Z-1.4462
N00333 G01 Z-1.5923
N00334 X-1.1829 Y1.1903 F28.
N00335 G03 X-1.1822 Y1.1895 I0 J-.0008
N00336 G01 X-1.1831 Y1.1902 F56.
N00337 G03 X-1.1822 Y1.1894 I-.0001 J-.001 F28.
N00338 G01 X-1.1834 Y1.1902 F56.
N00339 G03 X-1.1822 Y1.1891 I-.0002 J-.0013 F28.
N00340 G01 X-1.1838 Y1.1902 F56.

N00341 G03 X-1.1822 Y1.1886 I-.0003 J-.0019 F28.
N00342 G01 X-1.1845 Y1.1902 F56.
N00343 G03 X-1.1822 Y1.188 I-.0004 J-.0026 F28.
N00344 G01 X-1.1853 Y1.1902 F56.
N00345 G03 X-1.1822 Y1.1872 I-.0005 J-.0035 F28.
N00346 G01 X-1.1864 Y1.1902 F56.
N00347 G03 X-1.1822 Y1.1861 I-.0007 J-.0048 F28.
N00348 G01 X-1.1879 Y1.1902 F56.
N00349 G03 X-1.1823 Y1.1845 I-.001 J-.0066 F28.
N00350 G01 X-1.1899 Y1.1902 F56.
N00351 G03 X-1.1823 Y1.1825 I-.0012 J-.0088 F28.
N00352 G01 X-1.1924 Y1.1901 F56.
N00353 G03 X-1.1823 Y1.18 I-.0016 J-.0116 F28.
N00354 G01 X-1.1956 Y1.1901 F56.
N00355 G03 X-1.1823 Y1.1768 I-.0019 J-.0152 F28.
N00356 G01 X-1.1998 Y1.1901 F56.
N00357 G03 X-1.1824 Y1.1726 I-.0027 J-.0202 F28.
N00358 G01 X-1.2051 Y1.1901 F56.
N00359 G03 X-1.1824 Y1.1673 I-.003 J-.0257 F28.
N00360 G01 X-1.2113 Y1.19 F56.
N00361 G03 X-1.1824 Y1.1611 I-.0037 J-.0325 F28.
N00362 G01 X-1.2188 Y1.19 F56.
N00363 G03 X-1.1824 Y1.1536 I-.0043 J-.0406 F28.
N00364 G01 X-1.228 Y1.1899 F56.
N00365 G03 X-1.1825 Y1.1444 I-.0056 J-.0511 F28.
N00366 G01 X-1.2391 Y1.19 F56.
N00367 G03 X-1.1825 Y1.1334 I-.006 J-.0627 F28.
N00368 G01 X-1.2516 Y1.1899 F56.
N00369 G03 X-1.1825 Y1.1209 I-.0071 J-.0761 F28.
N00370 G01 X-1.2654 Y1.1899 F56.
N00371 G03 X-1.1825 Y1.107 I-.0074 J-.0903 F28.
N00372 G01 X-1.2804 Y1.1899 F56.
N00373 G03 X-1.1825 Y1.0921 I-.0082 J-.106 F28.
N00374 G01 X-1.2967 Y1.1899 F56.
N00375 G03 X-1.1825 Y1.0757 I-.0089 J-.123 F28.
N00376 G01 X-1.3142 Y1.1899 F56.
N00377 G03 X-1.1825 Y1.0582 I-.0093 J-.141 F28.
N00378 G01 X-1.3333 Y1.1899 F56.
N00379 G03 X-1.1825 Y1.0391 I-.0106 J-.1613 F28.
N00380 G01 X-1.3537 Y1.1899 F56.
N00381 G03 X-1.1825 Y1.0187 I-.0105 J-.1816 F28.
N00382 G01 X-1.3746 Y1.19 F56.
N00383 G03 X-1.1825 Y.9978 I-.0111 J-.2032 F28.
N00384 G01 X-1.3963 Y1.19 F56.
N00385 G03 X-1.1825 Y.9761 I-.0112 J-.2251 F28.
N00386 G01 X-1.4192 Y1.1899 F56.
N00387 G03 X-1.1825 Y.9533 I-.0122 J-.2489 F28.
N00388 G01 X-1.4433 Y1.19 F56.
N00389 G03 X-1.1825 Y.9292 I-.0124 J-.2732 F28.
N00390 G01 X-1.4685 Y1.1899 F56.
N00391 G03 X-1.1825 Y.904 I-.0134 J-.2993 F28.
N00392 G01 X-1.4939 Y1.19 F56.
N00393 G03 X-1.1824 Y.8785 I-.0126 J-.324 F28.
N00394 G01 X-1.5197 Y1.19 F56.
N00395 G03 X-1.1825 Y.8527 I-.0138 J-.3511 F28.
N00396 G01 X-1.5468 Y1.19 F56.
N00397 G03 X-1.1824 Y.8256 I-.0138 J-.3781 F28.
N00398 G01 X-1.5606 Y1.1903
N00399 G03 X-1.1822 Y.8119 I0 J-.3784

N00400 G01 X-1.5933 Y1.1888 F56.
N00401 G03 X-1.5933 Y.4349 I-.0328 J-.3769 F28.
N00402 G01 X-1.6581 Y1.1889 F56.
N00403 G03 X-1.6581 Y.4348 I-.032 J-.377 F28.
N00404 G01 X-1.7239 Y1.1887 F56.
N00405 G03 X-1.7239 Y.435 I-.0339 J-.3768 F28.
N00406 G01 X-1.7907 Y1.1888 F56.
N00407 G03 X-1.7907 Y.4349 I-.033 J-.3769 F28.
N00408 G01 X-1.8583 Y1.1887 F56.
N00409 G03 X-1.8583 Y.4351 I-.0347 J-.3768 F28.
N00410 G01 X-1.9266 Y1.1887 F56.
N00411 G03 X-1.9266 Y.435 I-.0337 J-.3768 F28.
N00412 G01 X-1.9931 Y1.1888 F56.
N00413 G03 X-1.9931 Y.4349 I-.0327 J-.3769 F28.
N00414 G01 X-2.0577 Y1.1889 F56.
N00415 G03 X-2.0577 Y.4348 I-.0318 J-.377 F28.
N00416 G01 X-2.1227 Y1.1888 F56.
N00417 G03 X-2.1227 Y.4349 I-.0332 J-.3769 F28.
N00418 G01 X-2.1903 Y1.1887 F56.
N00419 G03 X-2.1903 Y.435 I-.0344 J-.3768 F28.
N00420 G01 X-2.258 Y1.1888 F56.
N00421 G03 X-2.258 Y.4349 I-.0333 J-.3769 F28.
N00422 G01 X-2.3235 Y1.1889 F56.
N00423 G03 X-2.3235 Y.4348 I-.0323 J-.377 F28.
N00424 G01 X-2.389 Y1.1888 F56.
N00425 G03 X-2.389 Y.4349 I-.0332 J-.3769 F28.
N00426 G01 X-2.4562 Y1.1887 F56.
N00427 G03 X-2.4562 Y.435 I-.034 J-.3768 F28.
N00428 G01 X-2.523 Y1.1888 F56.
N00429 G03 X-2.523 Y.4349 I-.0328 J-.3769 F28.
N00430 G01 X-2.5874 Y1.1889 F56.
N00431 G03 X-2.5874 Y.4348 I-.0317 J-.377 F28.
N00432 G01 X-2.653 Y1.1887 F56.
N00433 G03 X-2.653 Y.435 I-.0339 J-.3768 F28.
N00434 G01 X-2.7195 Y1.1888 F56.
N00435 G03 X-2.7195 Y.4349 I-.0326 J-.3769 F28.
N00436 G01 X-2.7865 Y1.1887 F56.
N00437 G03 X-2.7865 Y.435 I-.0345 J-.3768 F28.
N00438 G01 X-2.854 Y1.1888 F56.
N00439 G03 X-2.854 Y.4349 I-.033 J-.3769 F28.
N00440 G01 X-2.9214 Y1.1887 F56.
N00441 G03 X-2.9214 Y.435 I-.0344 J-.3768 F28.
N00442 G01 X-2.9886 Y1.1888 F56.
N00443 G03 X-2.9886 Y.4349 I-.0328 J-.3769 F28.
N00444 G01 X-3.0553 Y1.1887 F56.
N00445 G03 X-3.0553 Y.435 I-.0339 J-.3768 F28.
N00446 G01 X-3.1238 Y1.1887 F56.
N00447 G03 X-3.1238 Y.4351 I-.0347 J-.3768 F28.
N00448 G01 X-3.1912 Y1.1888 F56.
N00449 G03 X-3.1912 Y.4349 I-.0328 J-.3769 F28.
N00450 G01 X-3.2571 Y1.1888 F56.
N00451 G03 X-3.2571 Y.4349 I-.0332 J-.3769 F28.
N00452 G01 X-3.3236 Y1.1888 F56.
N00453 G03 X-3.3236 Y.4349 I-.0333 J-.3769 F28.
N00454 G01 X-3.39 Y1.1888 F56.
N00455 G03 X-3.39 Y.4349 I-.0332 J-.3769 F28.
N00456 G01 X-3.456 Y1.1888 F56.
N00457 G03 X-3.456 Y.4349 I-.0328 J-.3769 F28.

N00458 G01 X-3.5227 Y1.1887 F56.
N00459 G03 X-3.5227 Y.435 I-.0338 J-.3768 F28.
N00460 G01 X-3.5909 Y1.1887 F56.
N00461 G03 X-3.5909 Y.435 I-.0343 J-.3768 F28.
N00462 G01 X-3.6595 Y1.1887 F56.
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N01899 G03 X-2.1903 Y.435 I-.0344 J-.3768 F28.
N01900 G01 X-2.258 Y1.1888 F56.
N01901 G03 X-2.258 Y.4349 I-.0333 J-.3769 F28.
N01902 G01 X-2.3235 Y1.1889 F56.
N01903 G03 X-2.3235 Y.4348 I-.0323 J-.377 F28.
N01904 G01 X-2.389 Y1.1888 F56.
N01905 G03 X-2.389 Y.4349 I-.0332 J-.3769 F28.
N01906 G01 X-2.4562 Y1.1887 F56.
N01907 G03 X-2.4562 Y.435 I-.034 J-.3768 F28.
N01908 G01 X-2.523 Y1.1888 F56.
N01909 G03 X-2.523 Y.4349 I-.0328 J-.3769 F28.
N01910 G01 X-2.5874 Y1.1889 F56.
N01911 G03 X-2.5874 Y.4348 I-.0317 J-.377 F28.
N01912 G01 X-2.653 Y1.1887 F56.
N01913 G03 X-2.653 Y.435 I-.0339 J-.3768 F28.
N01914 G01 X-2.7195 Y1.1888 F56.
N01915 G03 X-2.7195 Y.4349 I-.0326 J-.3769 F28.
N01916 G01 X-2.7865 Y1.1887 F56.
N01917 G03 X-2.7865 Y.435 I-.0345 J-.3768 F28.
N01918 G01 X-2.854 Y1.1888 F56.
N01919 G03 X-2.854 Y.4349 I-.033 J-.3769 F28.
N01920 G01 X-2.9214 Y1.1887 F56.
N01921 G03 X-2.9214 Y.435 I-.0344 J-.3768 F28.
N01922 G01 X-2.9886 Y1.1888 F56.
N01923 G03 X-2.9886 Y.4349 I-.0328 J-.3769 F28.
N01924 G01 X-3.0553 Y1.1887 F56.
N01925 G03 X-3.0553 Y.435 I-.0339 J-.3768 F28.
N01926 G01 X-3.1238 Y1.1887 F56.
N01927 G03 X-3.1238 Y.4351 I-.0347 J-.3768 F28.
N01928 G01 X-3.1912 Y1.1888 F56.
N01929 G03 X-3.1912 Y.4349 I-.0328 J-.3769 F28.
N01930 G01 X-3.2571 Y1.1888 F56.
N01931 G03 X-3.2571 Y.4349 I-.0332 J-.3769 F28.
N01932 G01 X-3.3236 Y1.1888 F56.
N01933 G03 X-3.3236 Y.4349 I-.0333 J-.3769 F28.
N01934 G01 X-3.39 Y1.1888 F56.
N01935 G03 X-3.39 Y.4349 I-.0332 J-.3769 F28.
N01936 G01 X-3.456 Y1.1888 F56.
N01937 G03 X-3.456 Y.4349 I-.0328 J-.3769 F28.

N01938 G01 X-3.5227 Y1.1887 F56.
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N01940 G01 X-3.5909 Y1.1887 F56.
N01941 G03 X-3.5909 Y.435 I-.0343 J-.3768 F28.
N01942 G01 X-3.6595 Y1.1887 F56.
N01943 G03 X-3.6595 Y.435 I-.0342 J-.3768 F28.
N01944 G01 X-3.7273 Y1.1888 F56.
N01945 G03 X-3.7273 Y.435 I-.0337 J-.3769 F28.
N01946 G01 X-3.7935 Y1.1888 F56.
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N01948 G01 X-3.8591 Y1.1888 F56.
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N01962 G01 X-4.3235 Y1.1889 F56.
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N01968 G01 X-4.528 Y.984 F56.
N01969 X-4.3559 Y.8119
N01970 X-4.7222 Y.717
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N01973 G03 X-4.605 Y.4506 I.0627 J-.0494 F28.
N01974 G01 X-4.7343 Y.4335
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N01985 Z-1.8156
N01986 G01 Z-1.9617 F7.
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N01988 X-1.1822
N01989 Y1.1903
N01990 X-2.7563
N01991 X-4.528
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N01994 Z-1.8617 F7.
N01995 G00 Z.1
N01996 X-1.1822 Y1.3903
N01997 Z-1.8617
N01998 G01 Z-2.0079
N01999 X-1.1829 Y1.1903 F28.
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N02001 G01 X-1.1831 Y1.1902 F56.
N02002 G03 X-1.1822 Y1.1894 I-.0001 J-.001 F28.
N02003 G01 X-1.1834 Y1.1902 F56.
N02004 G03 X-1.1822 Y1.1891 I-.0002 J-.0013 F28.
N02005 G01 X-1.1838 Y1.1902 F56.

N02006 G03 X-1.1822 Y1.1886 I-.0003 J-.0019 F28.
N02007 G01 X-1.1845 Y1.1902 F56.
N02008 G03 X-1.1822 Y1.188 I-.0004 J-.0026 F28.
N02009 G01 X-1.1853 Y1.1902 F56.
N02010 G03 X-1.1822 Y1.1872 I-.0005 J-.0035 F28.
N02011 G01 X-1.1864 Y1.1902 F56.
N02012 G03 X-1.1822 Y1.1861 I-.0007 J-.0048 F28.
N02013 G01 X-1.1879 Y1.1902 F56.
N02014 G03 X-1.1823 Y1.1845 I-.001 J-.0066 F28.
N02015 G01 X-1.1899 Y1.1902 F56.
N02016 G03 X-1.1823 Y1.1825 I-.0012 J-.0088 F28.
N02017 G01 X-1.1924 Y1.1901 F56.
N02018 G03 X-1.1823 Y1.18 I-.0016 J-.0116 F28.
N02019 G01 X-1.1956 Y1.1901 F56.
N02020 G03 X-1.1823 Y1.1768 I-.0019 J-.0152 F28.
N02021 G01 X-1.1998 Y1.1901 F56.
N02022 G03 X-1.1824 Y1.1726 I-.0027 J-.0202 F28.
N02023 G01 X-1.2051 Y1.1901 F56.
N02024 G03 X-1.1824 Y1.1673 I-.003 J-.0257 F28.
N02025 G01 X-1.2113 Y1.19 F56.
N02026 G03 X-1.1824 Y1.1611 I-.0037 J-.0325 F28.
N02027 G01 X-1.2188 Y1.19 F56.
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N02029 G01 X-1.228 Y1.1899 F56.
N02030 G03 X-1.1825 Y1.1444 I-.0056 J-.0511 F28.
N02031 G01 X-1.2391 Y1.19 F56.
N02032 G03 X-1.1825 Y1.1334 I-.006 J-.0627 F28.
N02033 G01 X-1.2516 Y1.1899 F56.
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N02035 G01 X-1.2654 Y1.1899 F56.
N02036 G03 X-1.1825 Y1.107 I-.0074 J-.0903 F28.
N02037 G01 X-1.2804 Y1.1899 F56.
N02038 G03 X-1.1825 Y1.0921 I-.0082 J-.106 F28.
N02039 G01 X-1.2967 Y1.1899 F56.
N02040 G03 X-1.1825 Y1.0757 I-.0089 J-.123 F28.
N02041 G01 X-1.3142 Y1.1899 F56.
N02042 G03 X-1.1825 Y1.0582 I-.0093 J-.141 F28.
N02043 G01 X-1.3333 Y1.1899 F56.
N02044 G03 X-1.1825 Y1.0391 I-.0106 J-.1613 F28.
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N02046 G03 X-1.1825 Y1.0187 I-.0105 J-.1816 F28.
N02047 G01 X-1.3746 Y1.19 F56.
N02048 G03 X-1.1825 Y.9978 I-.0111 J-.2032 F28.
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N02051 G01 X-1.4192 Y1.1899 F56.
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N02054 G03 X-1.1825 Y.9292 I-.0124 J-.2732 F28.
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N02056 G03 X-1.1825 Y.904 I-.0134 J-.2993 F28.
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N02058 G03 X-1.1824 Y.8785 I-.0126 J-.324 F28.
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N02061 G01 X-1.5468 Y1.19 F56.
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N02068 G03 X-1.6581 Y.4348 I-.032 J-.377 F28.
N02069 G01 X-1.7239 Y1.1887 F56.
N02070 G03 X-1.7239 Y.435 I-.0339 J-.3768 F28.
N02071 G01 X-1.7907 Y1.1888 F56.
N02072 G03 X-1.7907 Y.4349 I-.033 J-.3769 F28.
N02073 G01 X-1.8583 Y1.1887 F56.
N02074 G03 X-1.8583 Y.4351 I-.0347 J-.3768 F28.
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N02084 G03 X-2.1903 Y.435 I-.0344 J-.3768 F28.
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N02099 G01 X-2.7195 Y1.1888 F56.
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N02101 G01 X-2.7865 Y1.1887 F56.
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N02103 G01 X-2.854 Y1.1888 F56.
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N02105 G01 X-2.9214 Y1.1887 F56.
N02106 G03 X-2.9214 Y.435 I-.0344 J-.3768 F28.
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N02121 G01 X-3.456 Y1.1888 F56.
N02122 G03 X-3.456 Y.4349 I-.0328 J-.3769 F28.

N02123 G01 X-3.5227 Y1.1887 F56.
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N02128 G03 X-3.6595 Y.435 I-.0342 J-.3768 F28.
N02129 G01 X-3.7273 Y1.1888 F56.
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N02133 G01 X-3.8591 Y1.1888 F56.
N02134 G03 X-3.8591 Y.4349 I-.0332 J-.3769 F28.
N02135 G01 X-3.9249 Y1.1888 F56.
N02136 G03 X-3.9249 Y.4349 I-.0326 J-.3769 F28.
N02137 G01 X-3.9917 Y1.1887 F56.
N02138 G03 X-3.9917 Y.435 I-.0342 J-.3768 F28.
N02139 G01 X-4.0594 Y1.1888 F56.
N02140 G03 X-4.0594 Y.435 I-.0335 J-.3769 F28.
N02141 G01 X-4.1258 Y1.1888 F56.
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N02147 G01 X-4.3235 Y1.1889 F56.
N02148 G03 X-4.3235 Y.4349 I-.0324 J-.377 F28.
N02149 G01 X-4.3559 Y1.1903
N02150 G03 X-4.3559 Y.4335 I0 J-.3784
N02151 G01 X-4.4479 Y1.1789 F56.
N02152 G03 X-4.7229 Y.9039 I-.0693 J-.2057 F28.
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N02155 X-4.7222 Y.717
N02156 G03 X-4.4507 Y.4456 I.2008 J-.0707 F28.
N02157 G01 X-4.7171 Y.5627 F56.
N02158 G03 X-4.605 Y.4506 I.0627 J-.0494 F28.
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N02160 X-4.3559 Y.8119 F56.
N02161 X-1.5606
N02162 X-1.4657 Y.4456
N02163 G03 X-1.1943 Y.717 I.0707 J.2007 F28.
N02164 G01 X-1.3114 Y.4506 F56.
N02165 G03 X-1.1993 Y.5627 I.0494 J.0627 F28.
N02166 G01 X-1.1822 Y.4335
N02167 X-1.1953 Y.5326 Z-1.9079
N02168 G00 Z.1
N02169 X-4.7109 Y.4568
N02170 Z-1.8617
N02171 G01 Z-2.0079 F7.
N02172 X-4.7343 Y.4335 F28.
N02173 X-1.1822
N02174 Y1.1903
N02175 X-2.7563
N02176 X-4.528
N02177 G03 X-4.7343 Y.984 I0 J-.2063
N02178 G01 Y.4335
N02179 Z-1.9079 F7.
N02180 G00 Z.1
(START OF OPERATION: SolidMill - Trochoidal Pocketing)
N02181 G00 G54 (Assuming G54)
N02182 X1.1813 Y1.3903
N02183 Z.1
N02184 Z-1.4
N02185 G01 Z-1.5462
N02186 Y1.1903 F28.
N02187 Y1.1153
N02188 G03 X1.1813 Y1.1903 I0 J.0375
N02189 G01 Y1.1895
N02190 G03 X1.1821 Y1.1903 I.0008 J0

N02191 G01 X1.1813 Y1.1894 F56.
N02192 G03 X1.1822 Y1.1902 I.001 J-.0002 F28.
N02193 G01 X1.1813 Y1.1891 F56.
N02194 G03 X1.1825 Y1.1902 I.0014 J-.0002 F28.
N02195 G01 X1.1813 Y1.1886 F56.
N02196 G03 X1.1829 Y1.1902 I.0019 J-.0003 F28.
N02197 G01 X1.1813 Y1.188 F56.
N02198 G03 X1.1836 Y1.1902 I.0027 J-.0004 F28.
N02199 G01 X1.1813 Y1.1872 F56.
N02200 G03 X1.1844 Y1.1902 I.0036 J-.0005 F28.
N02201 G01 X1.1814 Y1.1861 F56.
N02202 G03 X1.1855 Y1.1902 I.0048 J-.0007 F28.
N02203 G01 X1.1814 Y1.1845 F56.
N02204 G03 X1.187 Y1.1902 I.0066 J-.0009 F28.
N02205 G01 X1.1814 Y1.1825 F56.
N02206 G03 X1.189 Y1.1902 I.0088 J-.0011 F28.
N02207 G01 X1.1814 Y1.18 F56.
N02208 G03 X1.1915 Y1.1901 I.0117 J-.0015 F28.
N02209 G01 X1.1814 Y1.1768 F56.
N02210 G03 X1.1947 Y1.1901 I.0153 J-.0019 F28.
N02211 G01 X1.1815 Y1.1726 F56.
N02212 G03 X1.199 Y1.1901 I.0201 J-.0027 F28.
N02213 G01 X1.1815 Y1.1673 F56.
N02214 G03 X1.2042 Y1.1901 I.0257 J-.0029 F28.
N02215 G01 X1.1815 Y1.1611 F56.
N02216 G03 X1.2104 Y1.19 I.0326 J-.0036 F28.
N02217 G01 X1.1815 Y1.1536 F56.
N02218 G03 X1.2179 Y1.19 I.0407 J-.0042 F28.
N02219 G01 X1.1816 Y1.1444 F56.
N02220 G03 X1.2272 Y1.1899 I.0511 J-.0056 F28.
N02221 G01 X1.1816 Y1.1334 F56.
N02222 G03 X1.2382 Y1.19 I.0626 J-.0061 F28.
N02223 G01 X1.1816 Y1.1209 F56.
N02224 G03 X1.2507 Y1.1899 I.0762 J-.0071 F28.
N02225 G01 X1.1816 Y1.107 F56.
N02226 G03 X1.2646 Y1.1899 I.0903 J-.0074 F28.
N02227 G01 X1.1816 Y1.0921 F56.
N02228 G03 X1.2795 Y1.1899 I.1061 J-.0082 F28.
N02229 G01 X1.1816 Y1.0757 F56.
N02230 G03 X1.2959 Y1.1899 I.1231 J-.0088 F28.
N02231 G01 X1.1816 Y1.0582 F56.
N02232 G03 X1.3133 Y1.1899 I.141 J-.0093 F28.
N02233 G01 X1.1817 Y1.0391 F56.
N02234 G03 X1.3325 Y1.1899 I.1613 J-.0105 F28.
N02235 G01 X1.1816 Y1.0187 F56.
N02236 G03 X1.3528 Y1.1899 I.1817 J-.0104 F28.
N02237 G01 X1.1816 Y.9978 F56.
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N02239 G01 X1.1816 Y.9761 F56.
N02240 G03 X1.3954 Y1.19 I.225 J-.0112 F28.
N02241 G01 X1.1816 Y.9533 F56.
N02242 G03 X1.4183 Y1.1899 I.249 J-.0123 F28.
N02243 G01 X1.1816 Y.9292 F56.
N02244 G03 X1.4424 Y1.19 I.2732 J-.0124 F28.
N02245 G01 X1.1816 Y.904 F56.
N02246 G03 X1.4676 Y1.1899 I.2994 J-.0134 F28.
N02247 G01 X1.1816 Y.8785 F56.
N02248 G03 X1.4931 Y1.19 I.324 J-.0125 F28.

N02249 G01 X1.1816 Y.8527 F56.
N02250 G03 X1.5189 Y1.19 I.3511 J-.0138 F28.
N02251 G01 X1.1816 Y.8256 F56.
N02252 G03 X1.5459 Y1.19 I.3781 J-.0137 F28.
N02253 G01 X1.1813 Y.8119
N02254 G03 X1.5597 Y1.1903 I.3784 J0
N02255 G01 X1.1934 Y.717 F56.
N02256 G03 X1.4648 Y.4456 I.2008 J-.0707 F28.
N02257 G01 X1.1984 Y.5627 F56.
N02258 G03 X1.3105 Y.4506 I.0627 J-.0494 F28.
N02259 G01 X1.1813 Y.4335
N02260 X1.5597 Y.8119 F56.
N02261 X1.5925 Y.4349
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N04143 G01 X2.3226 Y.4348 F56.
N04144 G03 X2.3226 Y1.1889 I.0323 J.3771 F28.
N04145 G01 X2.3881 Y.4349 F56.
N04146 G03 X2.3881 Y1.1888 I.0332 J.377 F28.
N04147 G01 X2.4553 Y.435 F56.
N04148 G03 X2.4553 Y1.1887 I.034 J.3769 F28.
N04149 G01 X2.5221 Y.4349 F56.

N04150 G03 X2.5221 Y1.1888 I.0328 J.377
F28.
N04151 G01 X2.5865 Y.4348 F56.
N04152 G03 X2.5865 Y1.1889 I.0317 J.3771
F28.
N04153 G01 X2.6521 Y.435 F56.
N04154 G03 X2.6521 Y1.1887 I.0339 J.3769
F28.
N04155 G01 X2.7186 Y.4349 F56.
N04156 G03 X2.7186 Y1.1888 I.0326 J.377
F28.
N04157 G01 X2.7857 Y.435 F56.
N04158 G03 X2.7857 Y1.1887 I.0344 J.3769
F28.
N04159 G01 X2.8531 Y.4349 F56.
N04160 G03 X2.8531 Y1.1888 I.033 J.377
F28.
N04161 G01 X2.9205 Y.435 F56.
N04162 G03 X2.9205 Y1.1887 I.0344 J.3769
F28.
N04163 G01 X2.9877 Y.4349 F56.
N04164 G03 X2.9877 Y1.1888 I.0329 J.377
F28.
N04165 G01 X3.0544 Y.435 F56.
N04166 G03 X3.0544 Y1.1887 I.0339 J.3769
F28.
N04167 G01 X3.123 Y.4351 F56.
N04168 G03 X3.123 Y1.1887 I.0346 J.3768
F28.
N04169 G01 X3.1903 Y.4349 F56.
N04170 G03 X3.1903 Y1.1888 I.0328 J.377
F28.
N04171 G01 X3.2562 Y.4349 F56.
N04172 G03 X3.2562 Y1.1888 I.0332 J.377
F28.
N04173 G01 X3.3227 Y.4349 F56.
N04174 G03 X3.3227 Y1.1888 I.0333 J.377
F28.
N04175 G01 X3.3892 Y.4349 F56.
N04176 G03 X3.3892 Y1.1888 I.0331 J.377
F28.
N04177 G01 X3.4551 Y.4349 F56.
N04178 G03 X3.4551 Y1.1888 I.0328 J.377
F28.
N04179 G01 X3.5218 Y.435 F56.
N04180 G03 X3.5218 Y1.1887 I.0338 J.3769
F28.
N04181 G01 X3.59 Y.435 F56.
N04182 G03 X3.59 Y1.1887 I.0343 J.3769
F28.
N04183 G01 X3.6586 Y.435 F56.
N04184 G03 X3.6586 Y1.1887 I.0342 J.3769
F28.
N04185 G01 X3.7265 Y.435 F56.
N04186 G03 X3.7265 Y1.1888 I.0336 J.3769
F28.
N04187 G01 X3.7926 Y.4349 F56.
N04188 G03 X3.7926 Y1.1888 I.0326 J.377
F28.
N04189 G01 X3.8583 Y.4349 F56.
N04190 G03 X3.8583 Y1.1888 I.0331 J.377
F28.
N04191 G01 X3.924 Y.4349 F56.
N04192 G03 X3.924 Y1.1888 I.0326 J.377
F28.
N04193 G01 X3.9908 Y.435 F56.
N04194 G03 X3.9908 Y1.1887 I.0342 J.3769
F28.
N04195 G01 X4.0586 Y.435 F56.
N04196 G03 X4.0586 Y1.1888 I.0335 J.3769
F28.
N04197 G01 X4.1249 Y.4349 F56.
N04198 G03 X4.1249 Y1.1888 I.0329 J.377
F28.
N04199 G01 X4.1917 Y.435 F56.
N04200 G03 X4.1917 Y1.1887 I.0339 J.3769
F28.
N04201 G01 X4.2579 Y.4349 F56.
N04202 G03 X4.2579 Y1.1889 I.0324 J.377
F28.
N04203 G01 X4.3226 Y.4349 F56.
N04204 G03 X4.3226 Y1.1889 I.0324 J.377
F28.
N04205 G01 X4.355 Y.4335
N04206 G03 X4.355 Y1.1903 I0 J.3784
N04207 G01 X4.4498 Y.4456 F56.
N04208 G03 X4.7213 Y.717 I.0707 J.2007
F28.

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N04209 G01 X4.6042 Y.4506 F56.
N04210 G03 X4.7162 Y.5627 I.0494 J.0627
F28.
N04211 G01 X4.7334 Y.4335
N04212 X4.355 Y.8119 F56.
N04213 X4.722 Y.9039
N04214 G03 X4.447 Y1.1789 I-.2056 J.0693
F28.
N04215 G01 Z-1.9079 F7.
N04216 G00 Z.1
N04217 X1.1813 Y1.1895
N04218 Z-1.8617
N04219 G01 Z-2.0079
N04220 Y1.1903 F28.
N04221 Y.4335
N04222 X4.7334
N04223 Y.984
N04224 G03 X4.5271 Y1.1903 I-.2063 J0
N04225 G01 X2.7555
N04226 X1.1813
N04227 Z-1.9079 F7.
N04228 G00 Z.1
N04229 G00 Z.1
N04230 G00 G90
N04231 G00 G53 Z0.0
N04232 G00 G53 X-15. Y0.
N04233 M30
%
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C.10 Flange – Setup 5

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%
O0001 (Flange Setup 5)
(HAAS VF2 Toby Working)
(1/7/2011 4:33:00 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M08
N00005 S4000
N00006 M03
N00007 G00 X-7.5012 Y2.8149 (MOVE TO
FIRST X AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-7.5012 Y2.8149
N00011 G01 Z-.0383 F9.
N00012 X7.5021 F36.
N00013 Z.0618 F9.
N00014 G00 Z.1
N00015 X-7.5271 Y1.3149
N00016 G01 Z-.0383
N00017 X7.528 F36.
N00018 Z.0618 F9.
N00019 G00 Z.1
N00020 X-7.5271 Y-.1851
N00021 G01 Z-.0383
N00022 X7.528 F36.
N00023 Z.0618 F9.
N00024 G00 Z.1
N00025 X-7.5271 Y-1.6851
N00026 G01 Z-.0383
N00027 X7.528 F36.
N00028 Z.0618 F9.
N00029 G00 Z.1
N00030 X-7.5271 Y-2.815
N00031 G01 Z-.0383
N00032 X7.528 F36.
N00033 Z.0618 F9.
N00034 G00 X-7.5012 Y2.8149
N00035 G01 Z-.0765
N00036 X7.5021 F36.
N00037 Z.0235 F9.
N00038 G00 Z.0618
N00039 X-7.5271 Y1.3149
N00040 G01 Z-.0765
N00041 X7.528 F36.
N00042 Z.0235 F9.
N00043 G00 Z.0618
N00044 X-7.5271 Y-.1851
N00045 G01 Z-.0765
N00046 X7.528 F36.
N00047 Z.0235 F9.
N00048 G00 Z.0618
N00049 X-7.5271 Y-1.6851
N00050 G01 Z-.0765
N00051 X7.528 F36.
N00052 Z.0235 F9.
N00053 G00 Z.0618
N00054 X-7.5271 Y-2.815
N00055 G01 Z-.0765
N00056 X7.528 F36.
N00057 Z.0235 F9.
N00058 G00 X-7.5012 Y2.8149
N00059 G01 Z-.1148
N00060 X7.5021 F36.
N00061 Z-.0148 F9.
N00062 G00 Z.0235
N00063 X-7.5271 Y1.3149
N00064 G01 Z-.1148
N00065 X7.528 F36.
N00066 Z-.0148 F9.
N00067 G00 Z.0235
N00068 X-7.5271 Y-.1851
N00069 G01 Z-.1148
N00070 X7.528 F36.
N00071 Z-.0148 F9.
N00072 G00 Z.0235
N00073 X-7.5271 Y-1.6851
N00074 G01 Z-.1148
N00075 X7.528 F36.
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N00076 Z-.0148 F9.
N00077 G00 Z.0235
N00078 X-7.5271 Y-2.815
N00079 G01 Z-.1148
N00080 X7.528 F36.
N00081 Z-.0148 F9.
N00082 G00 X-7.5012 Y2.8149
N00083 G01 Z-.153
N00084 X7.5021 F36.
N00085 Z-.053 F9.
N00086 G00 Z-.0148
N00087 X-7.5271 Y1.3149
N00088 G01 Z-.153
N00089 X7.528 F36.
N00090 Z-.053 F9.
N00091 G00 Z-.0148
N00092 X-7.5271 Y-.1851
N00093 G01 Z-.153
N00094 X7.528 F36.
N00095 Z-.053 F9.
N00096 G00 Z-.0148
N00097 X-7.5271 Y-1.6851
N00098 G01 Z-.153
N00099 X7.528 F36.
N00100 Z-.053 F9.
N00101 G00 Z-.0148
N00102 X-7.5271 Y-2.815
N00103 G01 Z-.153
N00104 X7.528 F36.
N00105 Z-.053 F9.
N00106 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL DR 0.048 in)
(Virtual Tool Cnange)
(No Approach Move)
N00107 M05
N00108 M09
N00109 G00 G40 G49 G80 G90
N00110 T03 M06
N00112 G43 H03 M08
N00113 S2000
N00114 M03
N00115 G00 X.0004 Y-1.4469 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION: SolidMill - Drilling)
N00116 G00 G54 (Assuming G54)
N00117 X.0004 Y-1.4469
N00118 Z.1
N00119 G81 G98 Z-.1942 R-.05 F2.
N00120 G80
N00121 G00 Z.1
(START OF OPERATION: SolidMill - Drilling)
N00122 G00 G54 (Assuming G54)
N00123 X2.9532 Y1.2401
N00124 Z.1
N00125 G81 G98 Z-.1942 R-.05 F2.
N00126 G80
N00127 G00 Z.1
N00128 G81 G98 Y-1.7126 Z-.1942 R-.05 F2.
N00129 G80
N00130 G00 Z.1
N00131 G81 G98 X-2.9523 Z-.1942 R-.05 F2.
N00132 G80
N00133 G00 Z.1
N00134 G81 G98 Y1.2401 Z-.1942 R-.05 F2.
N00135 G80
N00136 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL DR 0.4375 in)
(Virtual Tool Cnange)
(No Approach Move)
N00137 M05
N00138 M09
N00139 G00 G40 G49 G80 G90
N00140 T04 M06
N00142 G43 H04 M08
N00143 S250
N00144 M03
N00145 G00 X.0004 Y-1.4469 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION: SolidMill - Drilling)
N00146 G00 G54 (Assuming G54)
N00147 X.0004 Y-1.4469
N00148 Z.1
N00149 G98 G83 X.0004 Y-1.4469 Z-2.402 R-.05 Q.075 F3.25 P0
N00150 G80
N00151 G00 Z.1

(START OF OPERATION: SolidMill - Drilling)
N00152 G00 G54 (Assuming G54)
N00153 X2.9532 Y1.2401
N00154 Z.1
N00155 G98 G83 X2.9532 Y1.2401 Z-2.402 R-.05 Q.075 F3.25 P0
N00156 G80
N00157 G00 Z.1
N00158 G98 G83 X2.9532 Y-1.7126 Z-2.402 R-.05 Q.075 F3.25 P0
N00159 G80
N00160 G00 Z.1
N00161 G98 G83 X-2.9523 Y-1.7126 Z-2.402 R-.05 Q.075 F3.25 P0
N00162 G80
N00163 G00 Z.1
N00164 G98 G83 X-2.9523 Y1.2401 Z-2.402 R-.05 Q.075 F3.25 P0
N00165 G80
N00166 G00 Z.1
(TOOLCHANGE)
(CHANGING TO TOOL EM 0.375 in)
(Virtual Tool Cnange)
(No Approach Move)
N00167 M05
N00168 M09
N00169 G00 G40 G49 G80 G90
N00170 T02 M06
N00172 G43 H02 M08
N00173 S4000
N00174 M03
N00175 G00 X2.9532 Y1.1971 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION: SolidMill - Pocketing)
N00176 G00 G54 (Assuming G54)
N00177 X2.9532 Y1.1971
N00178 Z.1
N00179 Z-.05
N00180 G01 Z-.2 F6.4
N00181 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00182 X2.9532 Y1.3301 I0 J.0665
N00183 X2.9532 Y1.1033 I0 J-.1134
N00184 X2.9532 Y1.4238 I0 J.1603
N00185 X2.9532 Y1.0096 I0 J-.2071
N00186 X2.9532 Y1.5176 I0 J.254
N00187 X2.9532 Y.9158 I0 J-.3009
N00188 X2.9532 Y.9158 I0 J.3243
N00189 G01 Y1.0158
N00190 G00 Z-.1
N00191 Y1.1971
N00192 G01 Z-.25 F6.4
N00193 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00194 X2.9532 Y1.3301 I0 J.0665
N00195 X2.9532 Y1.1033 I0 J-.1134
N00196 X2.9532 Y1.4238 I0 J.1603
N00197 X2.9532 Y1.0096 I0 J-.2071
N00198 X2.9532 Y1.5176 I0 J.254
N00199 X2.9532 Y.9158 I0 J-.3009
N00200 X2.9532 Y.9158 I0 J.3243
N00201 G01 Y1.0158
N00202 G00 Z-.15
N00203 Y1.1971
N00204 G01 Z-.3 F6.4
N00205 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00206 X2.9532 Y1.3301 I0 J.0665
N00207 X2.9532 Y1.1033 I0 J-.1134
N00208 X2.9532 Y1.4238 I0 J.1603
N00209 X2.9532 Y1.0096 I0 J-.2071
N00210 X2.9532 Y1.5176 I0 J.254
N00211 X2.9532 Y.9158 I0 J-.3009
N00212 X2.9532 Y.9158 I0 J.3243
N00213 G01 Y1.0158
N00214 G00 Z-.2
N00215 Y1.1971
N00216 G01 Z-.35 F6.4
N00217 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00218 X2.9532 Y1.3301 I0 J.0665
N00219 X2.9532 Y1.1033 I0 J-.1134
N00220 X2.9532 Y1.4238 I0 J.1603
N00221 X2.9532 Y1.0096 I0 J-.2071
N00222 X2.9532 Y1.5176 I0 J.254
N00223 X2.9532 Y.9158 I0 J-.3009
N00224 X2.9532 Y.9158 I0 J.3243
N00225 G01 Y1.0158
N00226 G00 Z-.25
N00227 Y1.1971
N00228 G01 Z-.4 F6.4

N00229 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00230 X2.9532 Y1.3301 I0 J.0665
N00231 X2.9532 Y1.1033 I0 J-.1134
N00232 X2.9532 Y1.4238 I0 J.1603
N00233 X2.9532 Y1.0096 I0 J-.2071
N00234 X2.9532 Y1.5176 I0 J.254
N00235 X2.9532 Y.9158 I0 J-.3009
N00236 X2.9532 Y.9158 I0 J.3243
N00237 G01 Y1.0158
N00238 G00 Z-.3
N00239 Y1.1971
N00240 G01 Z-.45 F6.4
N00241 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00242 X2.9532 Y1.3301 I0 J.0665
N00243 X2.9532 Y1.1033 I0 J-.1134
N00244 X2.9532 Y1.4238 I0 J.1603
N00245 X2.9532 Y1.0096 I0 J-.2071
N00246 X2.9532 Y1.5176 I0 J.254
N00247 X2.9532 Y.9158 I0 J-.3009
N00248 X2.9532 Y.9158 I0 J.3243
N00249 G01 Y1.0158
N00250 G00 Z-.35
N00251 Y1.1971
N00252 G01 Z-.5 F6.4
N00253 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00254 X2.9532 Y1.3301 I0 J.0665
N00255 X2.9532 Y1.1033 I0 J-.1134
N00256 X2.9532 Y1.4238 I0 J.1603
N00257 X2.9532 Y1.0096 I0 J-.2071
N00258 X2.9532 Y1.5176 I0 J.254
N00259 X2.9532 Y.9158 I0 J-.3009
N00260 X2.9532 Y.9158 I0 J.3243
N00261 G01 Y1.0158
N00262 G00 Z-.4
N00263 Y1.1971
N00264 G01 Z-.55 F6.4
N00265 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00266 X2.9532 Y1.3301 I0 J.0665
N00267 X2.9532 Y1.1033 I0 J-.1134
N00268 X2.9532 Y1.4238 I0 J.1603
N00269 X2.9532 Y1.0096 I0 J-.2071
N00270 X2.9532 Y1.5176 I0 J.254
N00271 X2.9532 Y.9158 I0 J-.3009
N00272 X2.9532 Y.9158 I0 J.3243
N00273 G01 Y1.0158
N00274 G00 Z-.45
N00275 Y1.1971
N00276 G01 Z-.6 F6.4
N00277 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00278 X2.9532 Y1.3301 I0 J.0665
N00279 X2.9532 Y1.1033 I0 J-.1134
N00280 X2.9532 Y1.4238 I0 J.1603
N00281 X2.9532 Y1.0096 I0 J-.2071
N00282 X2.9532 Y1.5176 I0 J.254
N00283 X2.9532 Y.9158 I0 J-.3009
N00284 X2.9532 Y.9158 I0 J.3243
N00285 G01 Y1.0158
N00286 G00 Z-.5
N00287 Y1.1971
N00288 G01 Z-.65 F6.4
N00289 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00290 X2.9532 Y1.3301 I0 J.0665
N00291 X2.9532 Y1.1033 I0 J-.1134
N00292 X2.9532 Y1.4238 I0 J.1603
N00293 X2.9532 Y1.0096 I0 J-.2071
N00294 X2.9532 Y1.5176 I0 J.254
N00295 X2.9532 Y.9158 I0 J-.3009
N00296 X2.9532 Y.9158 I0 J.3243
N00297 G01 Y1.0158
N00298 G00 Z-.55
N00299 Y1.1971
N00300 G01 Z-.7 F6.4
N00301 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00302 X2.9532 Y1.3301 I0 J.0665
N00303 X2.9532 Y1.1033 I0 J-.1134
N00304 X2.9532 Y1.4238 I0 J.1603
N00305 X2.9532 Y1.0096 I0 J-.2071
N00306 X2.9532 Y1.5176 I0 J.254
N00307 X2.9532 Y.9158 I0 J-.3009
N00308 X2.9532 Y.9158 I0 J.3243
N00309 G01 Y1.0158
N00310 G00 Z-.6
N00311 Y1.1971
N00312 G01 Z-.75 F6.4
N00313 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00314 X2.9532 Y1.3301 I0 J.0665
N00315 X2.9532 Y1.1033 I0 J-.1134
N00316 X2.9532 Y1.4238 I0 J.1603

N00317 X2.9532 Y1.0096 I0 J-.2071
N00318 X2.9532 Y1.5176 I0 J.254
N00319 X2.9532 Y.9158 I0 J-.3009
N00320 X2.9532 Y.9158 I0 J.3243
N00321 G01 Y1.0158
N00322 G00 Z-.65
N00323 Y1.1971
N00324 G01 Z-.8 F6.4
N00325 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00326 X2.9532 Y1.3301 I0 J.0665
N00327 X2.9532 Y1.1033 I0 J-.1134
N00328 X2.9532 Y1.4238 I0 J.1603
N00329 X2.9532 Y1.0096 I0 J-.2071
N00330 X2.9532 Y1.5176 I0 J.254
N00331 X2.9532 Y.9158 I0 J-.3009
N00332 X2.9532 Y.9158 I0 J.3243
N00333 G01 Y1.0158
N00334 G00 Z-.7
N00335 Y1.1971
N00336 G01 Z-.85 F6.4
N00337 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00338 X2.9532 Y1.3301 I0 J.0665
N00339 X2.9532 Y1.1033 I0 J-.1134
N00340 X2.9532 Y1.4238 I0 J.1603
N00341 X2.9532 Y1.0096 I0 J-.2071
N00342 X2.9532 Y1.5176 I0 J.254
N00343 X2.9532 Y.9158 I0 J-.3009
N00344 X2.9532 Y.9158 I0 J.3243
N00345 G01 Y1.0158
N00346 G00 Z-.75
N00347 Y1.1971
N00348 G01 Z-.9 F6.4
N00349 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00350 X2.9532 Y1.3301 I0 J.0665
N00351 X2.9532 Y1.1033 I0 J-.1134
N00352 X2.9532 Y1.4238 I0 J.1603
N00353 X2.9532 Y1.0096 I0 J-.2071
N00354 X2.9532 Y1.5176 I0 J.254
N00355 X2.9532 Y.9158 I0 J-.3009
N00356 X2.9532 Y.9158 I0 J.3243
N00357 G01 Y1.0158
N00358 G00 Z-.8
N00359 Y1.1971
N00360 G01 Z-.95 F6.4
N00361 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00362 X2.9532 Y1.3301 I0 J.0665
N00363 X2.9532 Y1.1033 I0 J-.1134
N00364 X2.9532 Y1.4238 I0 J.1603
N00365 X2.9532 Y1.0096 I0 J-.2071
N00366 X2.9532 Y1.5176 I0 J.254
N00367 X2.9532 Y.9158 I0 J-.3009
N00368 X2.9532 Y.9158 I0 J.3243
N00369 G01 Y1.0158
N00370 G00 Z-.85
N00371 Y1.1971
N00372 G01 Z-1.0938 F6.4
N00373 G03 X2.9532 Y1.1971 I0 J.043 F28.
N00374 X2.9532 Y1.3301 I0 J.0665
N00375 X2.9532 Y1.1033 I0 J-.1134
N00376 X2.9532 Y1.4238 I0 J.1603
N00377 X2.9532 Y1.0096 I0 J-.2071
N00378 X2.9532 Y1.5176 I0 J.254
N00379 X2.9532 Y.9158 I0 J-.3009
N00380 X2.9532 Y.9158 I0 J.3243
N00381 G01 Y1.0158
N00382 G00 Z.1
(START OF OPERATION: SolidMill - Pocketing)
N00383 G00 G54 (Assuming G54)
N00384 X2.9532 Y-1.7557
N00385 Z.1
N00386 Z-.05
N00387 G01 Z-.2 F6.4
N00388 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00389 X2.9532 Y-1.6227 I0 J.0665
N00390 X2.9532 Y-1.8494 I0 J-.1134
N00391 X2.9532 Y-1.529 I0 J.1602
N00392 X2.9532 Y-1.9432 I0 J-.2071
N00393 X2.9532 Y-1.4352 I0 J.254
N00394 X2.9532 Y-2.0369 I0 J-.3009
N00395 X2.9532 Y-2.0369 I0 J.3243
N00396 G01 Y-1.9369
N00397 G00 Z-.1
N00398 Y-1.7557
N00399 G01 Z-.25 F6.4
N00400 G03 X2.9532 Y-1.7557 I0 J.0431 F28.

N00401 X2.9532 Y-1.6227 I0 J.0665
N00402 X2.9532 Y-1.8494 I0 J-.1134
N00403 X2.9532 Y-1.529 I0 J.1602
N00404 X2.9532 Y-1.9432 I0 J-.2071
N00405 X2.9532 Y-1.4352 I0 J.254
N00406 X2.9532 Y-2.0369 I0 J-.3009
N00407 X2.9532 Y-2.0369 I0 J.3243
N00408 G01 Y-1.9369
N00409 G00 Z-.15
N00410 Y-1.7557
N00411 G01 Z-.3 F6.4
N00412 G03 X2.9532 Y-1.7557 I0 J.0431
F28.
N00413 X2.9532 Y-1.6227 I0 J.0665
N00414 X2.9532 Y-1.8494 I0 J-.1134
N00415 X2.9532 Y-1.529 I0 J.1602
N00416 X2.9532 Y-1.9432 I0 J-.2071
N00417 X2.9532 Y-1.4352 I0 J.254
N00418 X2.9532 Y-2.0369 I0 J-.3009
N00419 X2.9532 Y-2.0369 I0 J.3243
N00420 G01 Y-1.9369
N00421 G00 Z-.2
N00422 Y-1.7557
N00423 G01 Z-.35 F6.4
N00424 G03 X2.9532 Y-1.7557 I0 J.0431
F28.
N00425 X2.9532 Y-1.6227 I0 J.0665
N00426 X2.9532 Y-1.8494 I0 J-.1134
N00427 X2.9532 Y-1.529 I0 J.1602
N00428 X2.9532 Y-1.9432 I0 J-.2071
N00429 X2.9532 Y-1.4352 I0 J.254
N00430 X2.9532 Y-2.0369 I0 J-.3009
N00431 X2.9532 Y-2.0369 I0 J.3243
N00432 G01 Y-1.9369
N00433 G00 Z-.25
N00434 Y-1.7557
N00435 G01 Z-.4 F6.4
N00436 G03 X2.9532 Y-1.7557 I0 J.0431
F28.
N00437 X2.9532 Y-1.6227 I0 J.0665
N00438 X2.9532 Y-1.8494 I0 J-.1134
N00439 X2.9532 Y-1.529 I0 J.1602
N00440 X2.9532 Y-1.9432 I0 J-.2071
N00441 X2.9532 Y-1.4352 I0 J.254
N00442 X2.9532 Y-2.0369 I0 J-.3009
N00443 X2.9532 Y-2.0369 I0 J.3243
N00444 G01 Y-1.9369
N00445 G00 Z-.3
N00446 Y-1.7557
N00447 G01 Z-.45 F6.4
N00448 G03 X2.9532 Y-1.7557 I0 J.0431
F28.
N00449 X2.9532 Y-1.6227 I0 J.0665
N00450 X2.9532 Y-1.8494 I0 J-.1134
N00451 X2.9532 Y-1.529 I0 J.1602
N00452 X2.9532 Y-1.9432 I0 J-.2071
N00453 X2.9532 Y-1.4352 I0 J.254
N00454 X2.9532 Y-2.0369 I0 J-.3009
N00455 X2.9532 Y-2.0369 I0 J.3243
N00456 G01 Y-1.9369
N00457 G00 Z-.35
N00458 Y-1.7557
N00459 G01 Z-.5 F6.4
N00460 G03 X2.9532 Y-1.7557 I0 J.0431
F28.
N00461 X2.9532 Y-1.6227 I0 J.0665
N00462 X2.9532 Y-1.8494 I0 J-.1134
N00463 X2.9532 Y-1.529 I0 J.1602
N00464 X2.9532 Y-1.9432 I0 J-.2071
N00465 X2.9532 Y-1.4352 I0 J.254
N00466 X2.9532 Y-2.0369 I0 J-.3009
N00467 X2.9532 Y-2.0369 I0 J.3243
N00468 G01 Y-1.9369
N00469 G00 Z-.4
N00470 Y-1.7557
N00471 G01 Z-.55 F6.4
N00472 G03 X2.9532 Y-1.7557 I0 J.0431
F28.
N00473 X2.9532 Y-1.6227 I0 J.0665
N00474 X2.9532 Y-1.8494 I0 J-.1134
N00475 X2.9532 Y-1.529 I0 J.1602
N00476 X2.9532 Y-1.9432 I0 J-.2071
N00477 X2.9532 Y-1.4352 I0 J.254
N00478 X2.9532 Y-2.0369 I0 J-.3009
N00479 X2.9532 Y-2.0369 I0 J.3243
N00480 G01 Y-1.9369
N00481 G00 Z-.45
N00482 Y-1.7557

N00483 G01 Z-.6 F6.4
N00484 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00485 X2.9532 Y-1.6227 I0 J.0665
N00486 X2.9532 Y-1.8494 I0 J-.1134
N00487 X2.9532 Y-1.529 I0 J.1602
N00488 X2.9532 Y-1.9432 I0 J-.2071
N00489 X2.9532 Y-1.4352 I0 J.254
N00490 X2.9532 Y-2.0369 I0 J-.3009
N00491 X2.9532 Y-2.0369 I0 J.3243
N00492 G01 Y-1.9369
N00493 G00 Z-.5
N00494 Y-1.7557
N00495 G01 Z-.65 F6.4
N00496 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00497 X2.9532 Y-1.6227 I0 J.0665
N00498 X2.9532 Y-1.8494 I0 J-.1134
N00499 X2.9532 Y-1.529 I0 J.1602
N00500 X2.9532 Y-1.9432 I0 J-.2071
N00501 X2.9532 Y-1.4352 I0 J.254
N00502 X2.9532 Y-2.0369 I0 J-.3009
N00503 X2.9532 Y-2.0369 I0 J.3243
N00504 G01 Y-1.9369
N00505 G00 Z-.55
N00506 Y-1.7557
N00507 G01 Z-.7 F6.4
N00508 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00509 X2.9532 Y-1.6227 I0 J.0665
N00510 X2.9532 Y-1.8494 I0 J-.1134
N00511 X2.9532 Y-1.529 I0 J.1602
N00512 X2.9532 Y-1.9432 I0 J-.2071
N00513 X2.9532 Y-1.4352 I0 J.254
N00514 X2.9532 Y-2.0369 I0 J-.3009
N00515 X2.9532 Y-2.0369 I0 J.3243
N00516 G01 Y-1.9369
N00517 G00 Z-.6
N00518 Y-1.7557
N00519 G01 Z-.75 F6.4
N00520 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00521 X2.9532 Y-1.6227 I0 J.0665
N00522 X2.9532 Y-1.8494 I0 J-.1134
N00523 X2.9532 Y-1.529 I0 J.1602
N00524 X2.9532 Y-1.9432 I0 J-.2071
N00525 X2.9532 Y-1.4352 I0 J.254
N00526 X2.9532 Y-2.0369 I0 J-.3009
N00527 X2.9532 Y-2.0369 I0 J.3243
N00528 G01 Y-1.9369
N00529 G00 Z-.65
N00530 Y-1.7557
N00531 G01 Z-.8 F6.4
N00532 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00533 X2.9532 Y-1.6227 I0 J.0665
N00534 X2.9532 Y-1.8494 I0 J-.1134
N00535 X2.9532 Y-1.529 I0 J.1602
N00536 X2.9532 Y-1.9432 I0 J-.2071
N00537 X2.9532 Y-1.4352 I0 J.254
N00538 X2.9532 Y-2.0369 I0 J-.3009
N00539 X2.9532 Y-2.0369 I0 J.3243
N00540 G01 Y-1.9369
N00541 G00 Z-.7
N00542 Y-1.7557
N00543 G01 Z-.85 F6.4
N00544 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00545 X2.9532 Y-1.6227 I0 J.0665
N00546 X2.9532 Y-1.8494 I0 J-.1134
N00547 X2.9532 Y-1.529 I0 J.1602
N00548 X2.9532 Y-1.9432 I0 J-.2071
N00549 X2.9532 Y-1.4352 I0 J.254
N00550 X2.9532 Y-2.0369 I0 J-.3009
N00551 X2.9532 Y-2.0369 I0 J.3243
N00552 G01 Y-1.9369
N00553 G00 Z-.75
N00554 Y-1.7557
N00555 G01 Z-.9 F6.4
N00556 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00557 X2.9532 Y-1.6227 I0 J.0665
N00558 X2.9532 Y-1.8494 I0 J-.1134
N00559 X2.9532 Y-1.529 I0 J.1602
N00560 X2.9532 Y-1.9432 I0 J-.2071
N00561 X2.9532 Y-1.4352 I0 J.254
N00562 X2.9532 Y-2.0369 I0 J-.3009
N00563 X2.9532 Y-2.0369 I0 J.3243

N00564 G01 Y-1.9369
N00565 G00 Z-.8
N00566 Y-1.7557
N00567 G01 Z-.95 F6.4
N00568 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00569 X2.9532 Y-1.6227 I0 J.0665
N00570 X2.9532 Y-1.8494 I0 J-.1134
N00571 X2.9532 Y-1.529 I0 J.1602
N00572 X2.9532 Y-1.9432 I0 J-.2071
N00573 X2.9532 Y-1.4352 I0 J.254
N00574 X2.9532 Y-2.0369 I0 J-.3009
N00575 X2.9532 Y-2.0369 I0 J.3243
N00576 G01 Y-1.9369
N00577 G00 Z-.85
N00578 Y-1.7557
N00579 G01 Z-1.0938 F6.4
N00580 G03 X2.9532 Y-1.7557 I0 J.0431 F28.
N00581 X2.9532 Y-1.6227 I0 J.0665
N00582 X2.9532 Y-1.8494 I0 J-.1134
N00583 X2.9532 Y-1.529 I0 J.1602
N00584 X2.9532 Y-1.9432 I0 J-.2071
N00585 X2.9532 Y-1.4352 I0 J.254
N00586 X2.9532 Y-2.0369 I0 J-.3009
N00587 X2.9532 Y-2.0369 I0 J.3243
N00588 G01 Y-1.9369
N00589 G00 Z.1
(START OF OPERATION: SolidMill - Pocketing)
N00590 G00 G54 (Assuming G54)
N00591 X-2.9523 Y-1.7557
N00592 Z.1
N00593 Z-.05
N00594 G01 Z-.2 F6.4
N00595 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00596 X-2.9523 Y-1.6227 I0 J.0665
N00597 X-2.9523 Y-1.8494 I0 J-.1134
N00598 X-2.9523 Y-1.529 I0 J.1602
N00599 X-2.9523 Y-1.9432 I0 J-.2071
N00600 X-2.9523 Y-1.4352 I0 J.254
N00601 X-2.9523 Y-2.0369 I0 J-.3009
N00602 X-2.9523 Y-2.0369 I0 J.3243
N00603 G01 Y-1.9369
N00604 G00 Z-.1
N00605 Y-1.7557
N00606 G01 Z-.25 F6.4
N00607 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00608 X-2.9523 Y-1.6227 I0 J.0665
N00609 X-2.9523 Y-1.8494 I0 J-.1134
N00610 X-2.9523 Y-1.529 I0 J.1602
N00611 X-2.9523 Y-1.9432 I0 J-.2071
N00612 X-2.9523 Y-1.4352 I0 J.254
N00613 X-2.9523 Y-2.0369 I0 J-.3009
N00614 X-2.9523 Y-2.0369 I0 J.3243
N00615 G01 Y-1.9369
N00616 G00 Z-.15
N00617 Y-1.7557
N00618 G01 Z-.3 F6.4
N00619 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00620 X-2.9523 Y-1.6227 I0 J.0665
N00621 X-2.9523 Y-1.8494 I0 J-.1134
N00622 X-2.9523 Y-1.529 I0 J.1602
N00623 X-2.9523 Y-1.9432 I0 J-.2071
N00624 X-2.9523 Y-1.4352 I0 J.254
N00625 X-2.9523 Y-2.0369 I0 J-.3009
N00626 X-2.9523 Y-2.0369 I0 J.3243
N00627 G01 Y-1.9369
N00628 G00 Z-.2
N00629 Y-1.7557
N00630 G01 Z-.35 F6.4
N00631 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00632 X-2.9523 Y-1.6227 I0 J.0665
N00633 X-2.9523 Y-1.8494 I0 J-.1134
N00634 X-2.9523 Y-1.529 I0 J.1602
N00635 X-2.9523 Y-1.9432 I0 J-.2071
N00636 X-2.9523 Y-1.4352 I0 J.254
N00637 X-2.9523 Y-2.0369 I0 J-.3009
N00638 X-2.9523 Y-2.0369 I0 J.3243
N00639 G01 Y-1.9369
N00640 G00 Z-.25
N00641 Y-1.7557
N00642 G01 Z-.4 F6.4

N00643 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00644 X-2.9523 Y-1.6227 I0 J.0665
N00645 X-2.9523 Y-1.8494 I0 J-.1134
N00646 X-2.9523 Y-1.529 I0 J.1602
N00647 X-2.9523 Y-1.9432 I0 J-.2071
N00648 X-2.9523 Y-1.4352 I0 J.254
N00649 X-2.9523 Y-2.0369 I0 J-.3009
N00650 X-2.9523 Y-2.0369 I0 J.3243
N00651 G01 Y-1.9369
N00652 G00 Z-.3
N00653 Y-1.7557
N00654 G01 Z-.45 F6.4
N00655 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00656 X-2.9523 Y-1.6227 I0 J.0665
N00657 X-2.9523 Y-1.8494 I0 J-.1134
N00658 X-2.9523 Y-1.529 I0 J.1602
N00659 X-2.9523 Y-1.9432 I0 J-.2071
N00660 X-2.9523 Y-1.4352 I0 J.254
N00661 X-2.9523 Y-2.0369 I0 J-.3009
N00662 X-2.9523 Y-2.0369 I0 J.3243
N00663 G01 Y-1.9369
N00664 G00 Z-.35
N00665 Y-1.7557
N00666 G01 Z-.5 F6.4
N00667 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00668 X-2.9523 Y-1.6227 I0 J.0665
N00669 X-2.9523 Y-1.8494 I0 J-.1134
N00670 X-2.9523 Y-1.529 I0 J.1602
N00671 X-2.9523 Y-1.9432 I0 J-.2071
N00672 X-2.9523 Y-1.4352 I0 J.254
N00673 X-2.9523 Y-2.0369 I0 J-.3009
N00674 X-2.9523 Y-2.0369 I0 J.3243
N00675 G01 Y-1.9369
N00676 G00 Z-.4
N00677 Y-1.7557
N00678 G01 Z-.55 F6.4
N00679 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00680 X-2.9523 Y-1.6227 I0 J.0665
N00681 X-2.9523 Y-1.8494 I0 J-.1134
N00682 X-2.9523 Y-1.529 I0 J.1602
N00683 X-2.9523 Y-1.9432 I0 J-.2071
N00684 X-2.9523 Y-1.4352 I0 J.254
N00685 X-2.9523 Y-2.0369 I0 J-.3009
N00686 X-2.9523 Y-2.0369 I0 J.3243
N00687 G01 Y-1.9369
N00688 G00 Z-.45
N00689 Y-1.7557
N00690 G01 Z-.6 F6.4
N00691 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00692 X-2.9523 Y-1.6227 I0 J.0665
N00693 X-2.9523 Y-1.8494 I0 J-.1134
N00694 X-2.9523 Y-1.529 I0 J.1602
N00695 X-2.9523 Y-1.9432 I0 J-.2071
N00696 X-2.9523 Y-1.4352 I0 J.254
N00697 X-2.9523 Y-2.0369 I0 J-.3009
N00698 X-2.9523 Y-2.0369 I0 J.3243
N00699 G01 Y-1.9369
N00700 G00 Z-.5
N00701 Y-1.7557
N00702 G01 Z-.65 F6.4
N00703 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00704 X-2.9523 Y-1.6227 I0 J.0665
N00705 X-2.9523 Y-1.8494 I0 J-.1134
N00706 X-2.9523 Y-1.529 I0 J.1602
N00707 X-2.9523 Y-1.9432 I0 J-.2071
N00708 X-2.9523 Y-1.4352 I0 J.254
N00709 X-2.9523 Y-2.0369 I0 J-.3009
N00710 X-2.9523 Y-2.0369 I0 J.3243
N00711 G01 Y-1.9369
N00712 G00 Z-.55
N00713 Y-1.7557
N00714 G01 Z-.7 F6.4
N00715 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00716 X-2.9523 Y-1.6227 I0 J.0665
N00717 X-2.9523 Y-1.8494 I0 J-.1134
N00718 X-2.9523 Y-1.529 I0 J.1602
N00719 X-2.9523 Y-1.9432 I0 J-.2071
N00720 X-2.9523 Y-1.4352 I0 J.254
N00721 X-2.9523 Y-2.0369 I0 J-.3009
N00722 X-2.9523 Y-2.0369 I0 J.3243
N00723 G01 Y-1.9369

N00724 G00 Z-.6
N00725 Y-1.7557
N00726 G01 Z-.75 F6.4
N00727 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00728 X-2.9523 Y-1.6227 I0 J.0665
N00729 X-2.9523 Y-1.8494 I0 J-.1134
N00730 X-2.9523 Y-1.529 I0 J.1602
N00731 X-2.9523 Y-1.9432 I0 J-.2071
N00732 X-2.9523 Y-1.4352 I0 J.254
N00733 X-2.9523 Y-2.0369 I0 J-.3009
N00734 X-2.9523 Y-2.0369 I0 J.3243
N00735 G01 Y-1.9369
N00736 G00 Z-.65
N00737 Y-1.7557
N00738 G01 Z-.8 F6.4
N00739 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00740 X-2.9523 Y-1.6227 I0 J.0665
N00741 X-2.9523 Y-1.8494 I0 J-.1134
N00742 X-2.9523 Y-1.529 I0 J.1602
N00743 X-2.9523 Y-1.9432 I0 J-.2071
N00744 X-2.9523 Y-1.4352 I0 J.254
N00745 X-2.9523 Y-2.0369 I0 J-.3009
N00746 X-2.9523 Y-2.0369 I0 J.3243
N00747 G01 Y-1.9369
N00748 G00 Z-.7
N00749 Y-1.7557
N00750 G01 Z-.85 F6.4
N00751 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00752 X-2.9523 Y-1.6227 I0 J.0665
N00753 X-2.9523 Y-1.8494 I0 J-.1134
N00754 X-2.9523 Y-1.529 I0 J.1602
N00755 X-2.9523 Y-1.9432 I0 J-.2071
N00756 X-2.9523 Y-1.4352 I0 J.254
N00757 X-2.9523 Y-2.0369 I0 J-.3009
N00758 X-2.9523 Y-2.0369 I0 J.3243
N00759 G01 Y-1.9369
N00760 G00 Z-.75
N00761 Y-1.7557
N00762 G01 Z-.9 F6.4
N00763 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00764 X-2.9523 Y-1.6227 I0 J.0665
N00765 X-2.9523 Y-1.8494 I0 J-.1134
N00766 X-2.9523 Y-1.529 I0 J.1602
N00767 X-2.9523 Y-1.9432 I0 J-.2071
N00768 X-2.9523 Y-1.4352 I0 J.254
N00769 X-2.9523 Y-2.0369 I0 J-.3009
N00770 X-2.9523 Y-2.0369 I0 J.3243
N00771 G01 Y-1.9369
N00772 G00 Z-.8
N00773 Y-1.7557
N00774 G01 Z-.95 F6.4
N00775 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00776 X-2.9523 Y-1.6227 I0 J.0665
N00777 X-2.9523 Y-1.8494 I0 J-.1134
N00778 X-2.9523 Y-1.529 I0 J.1602
N00779 X-2.9523 Y-1.9432 I0 J-.2071
N00780 X-2.9523 Y-1.4352 I0 J.254
N00781 X-2.9523 Y-2.0369 I0 J-.3009
N00782 X-2.9523 Y-2.0369 I0 J.3243
N00783 G01 Y-1.9369
N00784 G00 Z-.85
N00785 Y-1.7557
N00786 G01 Z-1.0938 F6.4
N00787 G03 X-2.9523 Y-1.7557 I0 J.0431 F28.
N00788 X-2.9523 Y-1.6227 I0 J.0665
N00789 X-2.9523 Y-1.8494 I0 J-.1134
N00790 X-2.9523 Y-1.529 I0 J.1602
N00791 X-2.9523 Y-1.9432 I0 J-.2071
N00792 X-2.9523 Y-1.4352 I0 J.254
N00793 X-2.9523 Y-2.0369 I0 J-.3009
N00794 X-2.9523 Y-2.0369 I0 J.3243
N00795 G01 Y-1.9369
N00796 G00 Z.1
(START OF OPERATION: SolidMill - Pocketing)
N00797 G00 G54 (Assuming G54)
N00798 X-2.9523 Y1.1971
N00799 Z.1
N00800 Z-.05
N00801 G01 Z-.2 F6.4
N00802 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00803 X-2.9523 Y1.3301 I0 J.0665

N00804 X-2.9523 Y1.1033 I0 J-.1134
N00805 X-2.9523 Y1.4238 I0 J.1603
N00806 X-2.9523 Y1.0096 I0 J-.2071
N00807 X-2.9523 Y1.5176 I0 J.254
N00808 X-2.9523 Y.9158 I0 J-.3009
N00809 X-2.9523 Y.9158 I0 J.3243
N00810 G01 Y1.0158
N00811 G00 Z-.1
N00812 Y1.1971
N00813 G01 Z-.25 F6.4
N00814 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00815 X-2.9523 Y1.3301 I0 J.0665
N00816 X-2.9523 Y1.1033 I0 J-.1134
N00817 X-2.9523 Y1.4238 I0 J.1603
N00818 X-2.9523 Y1.0096 I0 J-.2071
N00819 X-2.9523 Y1.5176 I0 J.254
N00820 X-2.9523 Y.9158 I0 J-.3009
N00821 X-2.9523 Y.9158 I0 J.3243
N00822 G01 Y1.0158
N00823 G00 Z-.15
N00824 Y1.1971
N00825 G01 Z-.3 F6.4
N00826 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00827 X-2.9523 Y1.3301 I0 J.0665
N00828 X-2.9523 Y1.1033 I0 J-.1134
N00829 X-2.9523 Y1.4238 I0 J.1603
N00830 X-2.9523 Y1.0096 I0 J-.2071
N00831 X-2.9523 Y1.5176 I0 J.254
N00832 X-2.9523 Y.9158 I0 J-.3009
N00833 X-2.9523 Y.9158 I0 J.3243
N00834 G01 Y1.0158
N00835 G00 Z-.2
N00836 Y1.1971
N00837 G01 Z-.35 F6.4
N00838 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00839 X-2.9523 Y1.3301 I0 J.0665
N00840 X-2.9523 Y1.1033 I0 J-.1134
N00841 X-2.9523 Y1.4238 I0 J.1603
N00842 X-2.9523 Y1.0096 I0 J-.2071
N00843 X-2.9523 Y1.5176 I0 J.254
N00844 X-2.9523 Y.9158 I0 J-.3009
N00845 X-2.9523 Y.9158 I0 J.3243
N00846 G01 Y1.0158
N00847 G00 Z-.25
N00848 Y1.1971
N00849 G01 Z-.4 F6.4
N00850 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00851 X-2.9523 Y1.3301 I0 J.0665
N00852 X-2.9523 Y1.1033 I0 J-.1134
N00853 X-2.9523 Y1.4238 I0 J.1603
N00854 X-2.9523 Y1.0096 I0 J-.2071
N00855 X-2.9523 Y1.5176 I0 J.254
N00856 X-2.9523 Y.9158 I0 J-.3009
N00857 X-2.9523 Y.9158 I0 J.3243
N00858 G01 Y1.0158
N00859 G00 Z-.3
N00860 Y1.1971
N00861 G01 Z-.45 F6.4
N00862 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00863 X-2.9523 Y1.3301 I0 J.0665
N00864 X-2.9523 Y1.1033 I0 J-.1134
N00865 X-2.9523 Y1.4238 I0 J.1603
N00866 X-2.9523 Y1.0096 I0 J-.2071
N00867 X-2.9523 Y1.5176 I0 J.254
N00868 X-2.9523 Y.9158 I0 J-.3009
N00869 X-2.9523 Y.9158 I0 J.3243
N00870 G01 Y1.0158
N00871 G00 Z-.35
N00872 Y1.1971
N00873 G01 Z-.5 F6.4
N00874 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00875 X-2.9523 Y1.3301 I0 J.0665
N00876 X-2.9523 Y1.1033 I0 J-.1134
N00877 X-2.9523 Y1.4238 I0 J.1603
N00878 X-2.9523 Y1.0096 I0 J-.2071
N00879 X-2.9523 Y1.5176 I0 J.254
N00880 X-2.9523 Y.9158 I0 J-.3009
N00881 X-2.9523 Y.9158 I0 J.3243
N00882 G01 Y1.0158
N00883 G00 Z-.4
N00884 Y1.1971
N00885 G01 Z-.55 F6.4
N00886 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00887 X-2.9523 Y1.3301 I0 J.0665
N00888 X-2.9523 Y1.1033 I0 J-.1134
N00889 X-2.9523 Y1.4238 I0 J.1603
N00890 X-2.9523 Y1.0096 I0 J-.2071
N00891 X-2.9523 Y1.5176 I0 J.254

N00892 X-2.9523 Y.9158 I0 J-.3009
N00893 X-2.9523 Y.9158 I0 J.3243
N00894 G01 Y1.0158
N00895 G00 Z-.45
N00896 Y1.1971
N00897 G01 Z-.6 F6.4
N00898 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00899 X-2.9523 Y1.3301 I0 J.0665
N00900 X-2.9523 Y1.1033 I0 J-.1134
N00901 X-2.9523 Y1.4238 I0 J.1603
N00902 X-2.9523 Y1.0096 I0 J-.2071
N00903 X-2.9523 Y1.5176 I0 J.254
N00904 X-2.9523 Y.9158 I0 J-.3009
N00905 X-2.9523 Y.9158 I0 J.3243
N00906 G01 Y1.0158
N00907 G00 Z-.5
N00908 Y1.1971
N00909 G01 Z-.65 F6.4
N00910 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00911 X-2.9523 Y1.3301 I0 J.0665
N00912 X-2.9523 Y1.1033 I0 J-.1134
N00913 X-2.9523 Y1.4238 I0 J.1603
N00914 X-2.9523 Y1.0096 I0 J-.2071
N00915 X-2.9523 Y1.5176 I0 J.254
N00916 X-2.9523 Y.9158 I0 J-.3009
N00917 X-2.9523 Y.9158 I0 J.3243
N00918 G01 Y1.0158
N00919 G00 Z-.55
N00920 Y1.1971
N00921 G01 Z-.7 F6.4
N00922 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00923 X-2.9523 Y1.3301 I0 J.0665
N00924 X-2.9523 Y1.1033 I0 J-.1134
N00925 X-2.9523 Y1.4238 I0 J.1603
N00926 X-2.9523 Y1.0096 I0 J-.2071
N00927 X-2.9523 Y1.5176 I0 J.254
N00928 X-2.9523 Y.9158 I0 J-.3009
N00929 X-2.9523 Y.9158 I0 J.3243
N00930 G01 Y1.0158
N00931 G00 Z-.6
N00932 Y1.1971
N00933 G01 Z-.75 F6.4
N00934 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00935 X-2.9523 Y1.3301 I0 J.0665
N00936 X-2.9523 Y1.1033 I0 J-.1134
N00937 X-2.9523 Y1.4238 I0 J.1603
N00938 X-2.9523 Y1.0096 I0 J-.2071
N00939 X-2.9523 Y1.5176 I0 J.254
N00940 X-2.9523 Y.9158 I0 J-.3009
N00941 X-2.9523 Y.9158 I0 J.3243
N00942 G01 Y1.0158
N00943 G00 Z-.65
N00944 Y1.1971
N00945 G01 Z-.8 F6.4
N00946 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00947 X-2.9523 Y1.3301 I0 J.0665
N00948 X-2.9523 Y1.1033 I0 J-.1134
N00949 X-2.9523 Y1.4238 I0 J.1603
N00950 X-2.9523 Y1.0096 I0 J-.2071
N00951 X-2.9523 Y1.5176 I0 J.254
N00952 X-2.9523 Y.9158 I0 J-.3009
N00953 X-2.9523 Y.9158 I0 J.3243
N00954 G01 Y1.0158
N00955 G00 Z-.7
N00956 Y1.1971
N00957 G01 Z-.85 F6.4
N00958 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00959 X-2.9523 Y1.3301 I0 J.0665
N00960 X-2.9523 Y1.1033 I0 J-.1134
N00961 X-2.9523 Y1.4238 I0 J.1603
N00962 X-2.9523 Y1.0096 I0 J-.2071
N00963 X-2.9523 Y1.5176 I0 J.254
N00964 X-2.9523 Y.9158 I0 J-.3009
N00965 X-2.9523 Y.9158 I0 J.3243
N00966 G01 Y1.0158
N00967 G00 Z-.75
N00968 Y1.1971
N00969 G01 Z-.9 F6.4
N00970 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00971 X-2.9523 Y1.3301 I0 J.0665
N00972 X-2.9523 Y1.1033 I0 J-.1134
N00973 X-2.9523 Y1.4238 I0 J.1603
N00974 X-2.9523 Y1.0096 I0 J-.2071
N00975 X-2.9523 Y1.5176 I0 J.254
N00976 X-2.9523 Y.9158 I0 J-.3009
N00977 X-2.9523 Y.9158 I0 J.3243
N00978 G01 Y1.0158
N00979 G00 Z-.8

N00980 Y1.1971
N00981 G01 Z-.95 F6.4
N00982 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00983 X-2.9523 Y1.3301 I0 J.0665
N00984 X-2.9523 Y1.1033 I0 J-.1134
N00985 X-2.9523 Y1.4238 I0 J.1603
N00986 X-2.9523 Y1.0096 I0 J-.2071
N00987 X-2.9523 Y1.5176 I0 J.254
N00988 X-2.9523 Y.9158 I0 J-.3009
N00989 X-2.9523 Y.9158 I0 J.3243
N00990 G01 Y1.0158
N00991 G00 Z-.85
N00992 Y1.1971
N00993 G01 Z-1.0938 F6.4
N00994 G03 X-2.9523 Y1.1971 I0 J.043 F28.
N00995 X-2.9523 Y1.3301 I0 J.0665
N00996 X-2.9523 Y1.1033 I0 J-.1134
N00997 X-2.9523 Y1.4238 I0 J.1603
N00998 X-2.9523 Y1.0096 I0 J-.2071
N00999 X-2.9523 Y1.5176 I0 J.254
N01000 X-2.9523 Y.9158 I0 J-.3009
N01001 X-2.9523 Y.9158 I0 J.3243
N01002 G01 Y1.0158
N01003 G00 Z.1
(START OF OPERATION: SolidMill - Contouring)
N01004 G00 G54 (Assuming G54)
N01005 X-4.7127 Y2.5538
N01006 Z.1
N01007 G01 Z-.2 F6.4
N01008 X-4.8011 Y2.4654 F28.
N01009 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01010 G01 X-4.5978 Y2.4919
N01011 X-4.2041 Y2.8856
N01012 X-4.1776 Y2.9121
N01013 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01014 G01 X-4.266 Y3.0005
N01015 Z.1 F6.4
N01016 G00 X-4.7127 Y2.5538
N01017 G01 Z-.25
N01018 X-4.8011 Y2.4654 F28.
N01019 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01020 G01 X-4.5978 Y2.4919
N01021 X-4.2041 Y2.8856
N01022 X-4.1776 Y2.9121
N01023 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01024 G01 X-4.266 Y3.0005
N01025 Z.1 F6.4
N01026 G00 X-4.7127 Y2.5538
N01027 G01 Z-.3
N01028 X-4.8011 Y2.4654 F28.
N01029 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01030 G01 X-4.5978 Y2.4919
N01031 X-4.2041 Y2.8856
N01032 X-4.1776 Y2.9121
N01033 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01034 G01 X-4.266 Y3.0005
N01035 Z.1 F6.4
N01036 G00 X-4.7127 Y2.5538
N01037 G01 Z-.35
N01038 X-4.8011 Y2.4654 F28.
N01039 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01040 G01 X-4.5978 Y2.4919
N01041 X-4.2041 Y2.8856
N01042 X-4.1776 Y2.9121
N01043 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01044 G01 X-4.266 Y3.0005
N01045 Z.1 F6.4
N01046 G00 X-4.7127 Y2.5538
N01047 G01 Z-.4
N01048 X-4.8011 Y2.4654 F28.
N01049 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01050 G01 X-4.5978 Y2.4919
N01051 X-4.2041 Y2.8856
N01052 X-4.1776 Y2.9121
N01053 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01054 G01 X-4.266 Y3.0005
N01055 Z.1 F6.4
N01056 G00 X-4.7127 Y2.5538
N01057 G01 Z-.45
N01058 X-4.8011 Y2.4654 F28.
N01059 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01060 G01 X-4.5978 Y2.4919

N01061 X-4.2041 Y2.8856
N01062 X-4.1776 Y2.9121
N01063 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01064 G01 X-4.266 Y3.0005
N01065 Z.1 F6.4
N01066 G00 X-4.7127 Y2.5538
N01067 G01 Z-.5
N01068 X-4.8011 Y2.4654 F28.
N01069 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01070 G01 X-4.5978 Y2.4919
N01071 X-4.2041 Y2.8856
N01072 X-4.1776 Y2.9121
N01073 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01074 G01 X-4.266 Y3.0005
N01075 Z.1 F6.4
N01076 G00 X-4.7127 Y2.5538
N01077 G01 Z-.55
N01078 X-4.8011 Y2.4654 F28.
N01079 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01080 G01 X-4.5978 Y2.4919
N01081 X-4.2041 Y2.8856
N01082 X-4.1776 Y2.9121
N01083 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01084 G01 X-4.266 Y3.0005
N01085 Z.1 F6.4
N01086 G00 X-4.7127 Y2.5538
N01087 G01 Z-.6
N01088 X-4.8011 Y2.4654 F28.
N01089 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01090 G01 X-4.5978 Y2.4919
N01091 X-4.2041 Y2.8856
N01092 X-4.1776 Y2.9121
N01093 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01094 G01 X-4.266 Y3.0005
N01095 Z.1 F6.4
N01096 G00 X-4.7127 Y2.5538
N01097 G01 Z-.65
N01098 X-4.8011 Y2.4654 F28.
N01099 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01100 G01 X-4.5978 Y2.4919
N01101 X-4.2041 Y2.8856
N01102 X-4.1776 Y2.9121
N01103 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01104 G01 X-4.266 Y3.0005
N01105 Z.1 F6.4
N01106 G00 X-4.7127 Y2.5538
N01107 G01 Z-.7
N01108 X-4.8011 Y2.4654 F28.
N01109 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01110 G01 X-4.5978 Y2.4919
N01111 X-4.2041 Y2.8856
N01112 X-4.1776 Y2.9121
N01113 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01114 G01 X-4.266 Y3.0005
N01115 Z.1 F6.4
N01116 G00 X-4.7127 Y2.5538
N01117 G01 Z-.75
N01118 X-4.8011 Y2.4654 F28.
N01119 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01120 G01 X-4.5978 Y2.4919
N01121 X-4.2041 Y2.8856
N01122 X-4.1776 Y2.9121
N01123 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01124 G01 X-4.266 Y3.0005
N01125 Z.1 F6.4
N01126 G00 X-4.7127 Y2.5538
N01127 G01 Z-.8
N01128 X-4.8011 Y2.4654 F28.
N01129 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01130 G01 X-4.5978 Y2.4919
N01131 X-4.2041 Y2.8856
N01132 X-4.1776 Y2.9121
N01133 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01134 G01 X-4.266 Y3.0005
N01135 Z.1 F6.4
N01136 G00 X-4.7127 Y2.5538
N01137 G01 Z-.85
N01138 X-4.8011 Y2.4654 F28.
N01139 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01140 G01 X-4.5978 Y2.4919

N01141 X-4.2041 Y2.8856
N01142 X-4.1776 Y2.9121
N01143 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01144 G01 X-4.266 Y3.0005
N01145 Z.1 F6.4
N01146 G00 X-4.7127 Y2.5538
N01147 G01 Z-.9
N01148 X-4.8011 Y2.4654 F28.
N01149 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01150 G01 X-4.5978 Y2.4919
N01151 X-4.2041 Y2.8856
N01152 X-4.1776 Y2.9121
N01153 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01154 G01 X-4.266 Y3.0005
N01155 Z.1 F6.4
N01156 G00 X-4.7127 Y2.5538
N01157 G01 Z-.95
N01158 X-4.8011 Y2.4654 F28.
N01159 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01160 G01 X-4.5978 Y2.4919
N01161 X-4.2041 Y2.8856
N01162 X-4.1776 Y2.9121
N01163 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01164 G01 X-4.266 Y3.0005
N01165 Z.1 F6.4
N01166 G00 X-4.7127 Y2.5538
N01167 G01 Z-1.
N01168 X-4.8011 Y2.4654 F28.
N01169 G03 X-4.6243 Y2.4654 I.0884 J.0884
N01170 G01 X-4.5978 Y2.4919
N01171 X-4.2041 Y2.8856
N01172 X-4.1776 Y2.9121
N01173 G03 X-4.1776 Y3.0889 I-.0884 J.0884
N01174 G01 X-4.266 Y3.0005
N01175 Z.1 F6.4
(START OF OPERATION: SolidMill - Contouring)
N01176 G00 G54 (Assuming G54)
N01177 X4.2669 Y3.0005
N01178 Z.1
N01179 G01 Z-.2
N01180 X4.1785 Y3.0889 F28.
N01181 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01182 G01 X4.205 Y2.8856
N01183 X4.5987 Y2.4919
N01184 X4.6252 Y2.4654
N01185 G03 X4.802 Y2.4654 I.0884 J.0884
N01186 G01 X4.7136 Y2.5538
N01187 Z.1 F6.4
N01188 G00 X4.2669 Y3.0005
N01189 G01 Z-.25
N01190 X4.1785 Y3.0889 F28.
N01191 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01192 G01 X4.205 Y2.8856
N01193 X4.5987 Y2.4919
N01194 X4.6252 Y2.4654
N01195 G03 X4.802 Y2.4654 I.0884 J.0884
N01196 G01 X4.7136 Y2.5538
N01197 Z.1 F6.4
N01198 G00 X4.2669 Y3.0005
N01199 G01 Z-.3
N01200 X4.1785 Y3.0889 F28.
N01201 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01202 G01 X4.205 Y2.8856
N01203 X4.5987 Y2.4919
N01204 X4.6252 Y2.4654
N01205 G03 X4.802 Y2.4654 I.0884 J.0884
N01206 G01 X4.7136 Y2.5538
N01207 Z.1 F6.4
N01208 G00 X4.2669 Y3.0005
N01209 G01 Z-.35
N01210 X4.1785 Y3.0889 F28.
N01211 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01212 G01 X4.205 Y2.8856
N01213 X4.5987 Y2.4919
N01214 X4.6252 Y2.4654
N01215 G03 X4.802 Y2.4654 I.0884 J.0884
N01216 G01 X4.7136 Y2.5538
N01217 Z.1 F6.4
N01218 G00 X4.2669 Y3.0005
N01219 G01 Z-.4
N01220 X4.1785 Y3.0889 F28.
N01221 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01222 G01 X4.205 Y2.8856

N01223 X4.5987 Y2.4919
N01224 X4.6252 Y2.4654
N01225 G03 X4.802 Y2.4654 I.0884 J.0884
N01226 G01 X4.7136 Y2.5538
N01227 Z.1 F6.4
N01228 G00 X4.2669 Y3.0005
N01229 G01 Z-.45
N01230 X4.1785 Y3.0889 F28.
N01231 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01232 G01 X4.205 Y2.8856
N01233 X4.5987 Y2.4919
N01234 X4.6252 Y2.4654
N01235 G03 X4.802 Y2.4654 I.0884 J.0884
N01236 G01 X4.7136 Y2.5538
N01237 Z.1 F6.4
N01238 G00 X4.2669 Y3.0005
N01239 G01 Z-.5
N01240 X4.1785 Y3.0889 F28.
N01241 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01242 G01 X4.205 Y2.8856
N01243 X4.5987 Y2.4919
N01244 X4.6252 Y2.4654
N01245 G03 X4.802 Y2.4654 I.0884 J.0884
N01246 G01 X4.7136 Y2.5538
N01247 Z.1 F6.4
N01248 G00 X4.2669 Y3.0005
N01249 G01 Z-.55
N01250 X4.1785 Y3.0889 F28.
N01251 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01252 G01 X4.205 Y2.8856
N01253 X4.5987 Y2.4919
N01254 X4.6252 Y2.4654
N01255 G03 X4.802 Y2.4654 I.0884 J.0884
N01256 G01 X4.7136 Y2.5538
N01257 Z.1 F6.4
N01258 G00 X4.2669 Y3.0005
N01259 G01 Z-.6
N01260 X4.1785 Y3.0889 F28.
N01261 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01262 G01 X4.205 Y2.8856
N01263 X4.5987 Y2.4919
N01264 X4.6252 Y2.4654
N01265 G03 X4.802 Y2.4654 I.0884 J.0884
N01266 G01 X4.7136 Y2.5538
N01267 Z.1 F6.4
N01268 G00 X4.2669 Y3.0005
N01269 G01 Z-.65
N01270 X4.1785 Y3.0889 F28.
N01271 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01272 G01 X4.205 Y2.8856
N01273 X4.5987 Y2.4919
N01274 X4.6252 Y2.4654
N01275 G03 X4.802 Y2.4654 I.0884 J.0884
N01276 G01 X4.7136 Y2.5538
N01277 Z.1 F6.4
N01278 G00 X4.2669 Y3.0005
N01279 G01 Z-.7
N01280 X4.1785 Y3.0889 F28.
N01281 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01282 G01 X4.205 Y2.8856
N01283 X4.5987 Y2.4919
N01284 X4.6252 Y2.4654
N01285 G03 X4.802 Y2.4654 I.0884 J.0884
N01286 G01 X4.7136 Y2.5538
N01287 Z.1 F6.4
N01288 G00 X4.2669 Y3.0005
N01289 G01 Z-.75
N01290 X4.1785 Y3.0889 F28.
N01291 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01292 G01 X4.205 Y2.8856
N01293 X4.5987 Y2.4919
N01294 X4.6252 Y2.4654
N01295 G03 X4.802 Y2.4654 I.0884 J.0884
N01296 G01 X4.7136 Y2.5538
N01297 Z.1 F6.4
N01298 G00 X4.2669 Y3.0005
N01299 G01 Z-.8
N01300 X4.1785 Y3.0889 F28.
N01301 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01302 G01 X4.205 Y2.8856
N01303 X4.5987 Y2.4919
N01304 X4.6252 Y2.4654
N01305 G03 X4.802 Y2.4654 I.0884 J.0884
N01306 G01 X4.7136 Y2.5538
N01307 Z.1 F6.4
N01308 G00 X4.2669 Y3.0005
N01309 G01 Z-.85
N01310 X4.1785 Y3.0889 F28.

N01311 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01312 G01 X4.205 Y2.8856
N01313 X4.5987 Y2.4919
N01314 X4.6252 Y2.4654
N01315 G03 X4.802 Y2.4654 I.0884 J.0884
N01316 G01 X4.7136 Y2.5538
N01317 Z.1 F6.4
N01318 G00 X4.2669 Y3.0005
N01319 G01 Z-.9
N01320 X4.1785 Y3.0889 F28.
N01321 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01322 G01 X4.205 Y2.8856
N01323 X4.5987 Y2.4919
N01324 X4.6252 Y2.4654
N01325 G03 X4.802 Y2.4654 I.0884 J.0884
N01326 G01 X4.7136 Y2.5538
N01327 Z.1 F6.4
N01328 G00 X4.2669 Y3.0005
N01329 G01 Z-.95
N01330 X4.1785 Y3.0889 F28.
N01331 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01332 G01 X4.205 Y2.8856
N01333 X4.5987 Y2.4919
N01334 X4.6252 Y2.4654
N01335 G03 X4.802 Y2.4654 I.0884 J.0884
N01336 G01 X4.7136 Y2.5538
N01337 Z.1 F6.4
N01338 G00 X4.2669 Y3.0005
N01339 G01 Z-1.
N01340 X4.1785 Y3.0889 F28.
N01341 G03 X4.1785 Y2.9121 I.0884 J-.0884
N01342 G01 X4.205 Y2.8856
N01343 X4.5987 Y2.4919
N01344 X4.6252 Y2.4654
N01345 G03 X4.802 Y2.4654 I.0884 J.0884
N01346 G01 X4.7136 Y2.5538
N01347 Z.1 F6.4
(LAST TOOLCHANGE)
(CHANGING TO TOOL EMF 0.375 in)
(No Approach Move)
N01348 M05
N01349 M09
N01350 G00 G40 G49 G80 G90
N01351 T08 M06
N01353 G43 H08 M08
N01354 S4000
N01355 M03
N01356 G00 X.0004 Y-1.5584 (MOVE TO FIRST X AND Y LOCATION)
(START OF OPERATION: SolidMill - Pocketing)
N01357 G00 G54 (Assuming G54)
N01358 X.0004 Y-1.5584
N01359 Z.1
N01360 Z-.05
N01361 G01 Z-.1794 F6.
N01362 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01363 X.0004 Y-1.2791 I0 J.1396
N01364 X.0004 Y-1.6709 I0 J-.1959
N01365 X.0004 Y-1.1666 I0 J.2521
N01366 X.0004 Y-1.7834 I0 J-.3084
N01367 X.0004 Y-1.0541 I0 J.3646
N01368 X.0004 Y-1.8959 I0 J-.4209
N01369 X.0004 Y-.9416 I0 J.4771
N01370 X.0004 Y-2.0084 I0 J-.5334
N01371 X.0004 Y-.8291 I0 J.5896
N01372 X.0004 Y-2.1209 I0 J-.6459
N01373 X.0004 Y-.7166 I0 J.7021
N01374 X.0004 Y-2.2334 I0 J-.7584
N01375 X.0004 Y-.6041 I0 J.8146
N01376 X.0004 Y-2.3459 I0 J-.8709
N01377 X.0004 Y-2.3459 I0 J.899
N01378 G01 Y-2.2459
N01379 G00 Z-.0794
N01380 Y-1.5584
N01381 G01 Z-.2088 F6.
N01382 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01383 X.0004 Y-1.2791 I0 J.1396
N01384 X.0004 Y-1.6709 I0 J-.1959
N01385 X.0004 Y-1.1666 I0 J.2521
N01386 X.0004 Y-1.7834 I0 J-.3084
N01387 X.0004 Y-1.0541 I0 J.3646
N01388 X.0004 Y-1.8959 I0 J-.4209
N01389 X.0004 Y-.9416 I0 J.4771
N01390 X.0004 Y-2.0084 I0 J-.5334
N01391 X.0004 Y-.8291 I0 J.5896
N01392 X.0004 Y-2.1209 I0 J-.6459
N01393 X.0004 Y-.7166 I0 J.7021

N01394 X.0004 Y-2.2334 I0 J-.7584
N01395 X.0004 Y-.6041 I0 J.8146
N01396 X.0004 Y-2.3459 I0 J-.8709
N01397 X.0004 Y-2.3459 I0 J.899
N01398 G01 Y-2.2459
N01399 G00 Z-.1088
N01400 Y-1.5584
N01401 G01 Z-.2381 F6.
N01402 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01403 X.0004 Y-1.2791 I0 J.1396
N01404 X.0004 Y-1.6709 I0 J-.1959
N01405 X.0004 Y-1.1666 I0 J.2521
N01406 X.0004 Y-1.7834 I0 J-.3084
N01407 X.0004 Y-1.0541 I0 J.3646
N01408 X.0004 Y-1.8959 I0 J-.4209
N01409 X.0004 Y-.9416 I0 J.4771
N01410 X.0004 Y-2.0084 I0 J-.5334
N01411 X.0004 Y-.8291 I0 J.5896
N01412 X.0004 Y-2.1209 I0 J-.6459
N01413 X.0004 Y-.7166 I0 J.7021
N01414 X.0004 Y-2.2334 I0 J-.7584
N01415 X.0004 Y-.6041 I0 J.8146
N01416 X.0004 Y-2.3459 I0 J-.8709
N01417 X.0004 Y-2.3459 I0 J.899
N01418 G01 Y-2.2459
N01419 G00 Z-.1381
N01420 Y-1.5584
N01421 G01 Z-.2675 F6.
N01422 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01423 X.0004 Y-1.2791 I0 J.1396
N01424 X.0004 Y-1.6709 I0 J-.1959
N01425 X.0004 Y-1.1666 I0 J.2521
N01426 X.0004 Y-1.7834 I0 J-.3084
N01427 X.0004 Y-1.0541 I0 J.3646
N01428 X.0004 Y-1.8959 I0 J-.4209
N01429 X.0004 Y-.9416 I0 J.4771
N01430 X.0004 Y-2.0084 I0 J-.5334
N01431 X.0004 Y-.8291 I0 J.5896
N01432 X.0004 Y-2.1209 I0 J-.6459
N01433 X.0004 Y-.7166 I0 J.7021
N01434 X.0004 Y-2.2334 I0 J-.7584
N01435 X.0004 Y-.6041 I0 J.8146
N01436 X.0004 Y-2.3459 I0 J-.8709
N01437 X.0004 Y-2.3459 I0 J.899
N01438 G01 Y-2.2459
N01439 G00 Z-.1675
N01440 Y-1.5584
N01441 G01 Z-.2969 F6.
N01442 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01443 X.0004 Y-1.2791 I0 J.1396
N01444 X.0004 Y-1.6709 I0 J-.1959
N01445 X.0004 Y-1.1666 I0 J.2521
N01446 X.0004 Y-1.7834 I0 J-.3084
N01447 X.0004 Y-1.0541 I0 J.3646
N01448 X.0004 Y-1.8959 I0 J-.4209
N01449 X.0004 Y-.9416 I0 J.4771
N01450 X.0004 Y-2.0084 I0 J-.5334
N01451 X.0004 Y-.8291 I0 J.5896
N01452 X.0004 Y-2.1209 I0 J-.6459
N01453 X.0004 Y-.7166 I0 J.7021
N01454 X.0004 Y-2.2334 I0 J-.7584
N01455 X.0004 Y-.6041 I0 J.8146
N01456 X.0004 Y-2.3459 I0 J-.8709
N01457 X.0004 Y-2.3459 I0 J.899
N01458 G01 Y-2.2459
N01459 G00 Z-.1969
N01460 Y-1.5584
N01461 G01 Z-.3263 F6.
N01462 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01463 X.0004 Y-1.2791 I0 J.1396
N01464 X.0004 Y-1.6709 I0 J-.1959
N01465 X.0004 Y-1.1666 I0 J.2521
N01466 X.0004 Y-1.7834 I0 J-.3084
N01467 X.0004 Y-1.0541 I0 J.3646
N01468 X.0004 Y-1.8959 I0 J-.4209
N01469 X.0004 Y-.9416 I0 J.4771
N01470 X.0004 Y-2.0084 I0 J-.5334
N01471 X.0004 Y-.8291 I0 J.5896
N01472 X.0004 Y-2.1209 I0 J-.6459
N01473 X.0004 Y-.7166 I0 J.7021
N01474 X.0004 Y-2.2334 I0 J-.7584
N01475 X.0004 Y-.6041 I0 J.8146
N01476 X.0004 Y-2.3459 I0 J-.8709
N01477 X.0004 Y-2.3459 I0 J.899
N01478 G01 Y-2.2459
N01479 G00 Z-.2263
N01480 Y-1.5584
N01481 G01 Z-.3557 F6.

N01482 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01483 X.0004 Y-1.2791 I0 J.1396
N01484 X.0004 Y-1.6709 I0 J-.1959
N01485 X.0004 Y-1.1666 I0 J.2521
N01486 X.0004 Y-1.7834 I0 J-.3084
N01487 X.0004 Y-1.0541 I0 J.3646
N01488 X.0004 Y-1.8959 I0 J-.4209
N01489 X.0004 Y-.9416 I0 J.4771
N01490 X.0004 Y-2.0084 I0 J-.5334
N01491 X.0004 Y-.8291 I0 J.5896
N01492 X.0004 Y-2.1209 I0 J-.6459
N01493 X.0004 Y-.7166 I0 J.7021
N01494 X.0004 Y-2.2334 I0 J-.7584
N01495 X.0004 Y-.6041 I0 J.8146
N01496 X.0004 Y-2.3459 I0 J-.8709
N01497 X.0004 Y-2.3459 I0 J.899
N01498 G01 Y-2.2459
N01499 G00 Z-.2557
N01500 Y-1.5584
N01501 G01 Z-.3851 F6.
N01502 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01503 X.0004 Y-1.2791 I0 J.1396
N01504 X.0004 Y-1.6709 I0 J-.1959
N01505 X.0004 Y-1.1666 I0 J.2521
N01506 X.0004 Y-1.7834 I0 J-.3084
N01507 X.0004 Y-1.0541 I0 J.3646
N01508 X.0004 Y-1.8959 I0 J-.4209
N01509 X.0004 Y-.9416 I0 J.4771
N01510 X.0004 Y-2.0084 I0 J-.5334
N01511 X.0004 Y-.8291 I0 J.5896
N01512 X.0004 Y-2.1209 I0 J-.6459
N01513 X.0004 Y-.7166 I0 J.7021
N01514 X.0004 Y-2.2334 I0 J-.7584
N01515 X.0004 Y-.6041 I0 J.8146
N01516 X.0004 Y-2.3459 I0 J-.8709
N01517 X.0004 Y-2.3459 I0 J.899
N01518 G01 Y-2.2459
N01519 G00 Z-.2851
N01520 Y-1.5584
N01521 G01 Z-.4144 F6.
N01522 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01523 X.0004 Y-1.2791 I0 J.1396
N01524 X.0004 Y-1.6709 I0 J-.1959
N01525 X.0004 Y-1.1666 I0 J.2521
N01526 X.0004 Y-1.7834 I0 J-.3084
N01527 X.0004 Y-1.0541 I0 J.3646
N01528 X.0004 Y-1.8959 I0 J-.4209
N01529 X.0004 Y-.9416 I0 J.4771
N01530 X.0004 Y-2.0084 I0 J-.5334
N01531 X.0004 Y-.8291 I0 J.5896
N01532 X.0004 Y-2.1209 I0 J-.6459
N01533 X.0004 Y-.7166 I0 J.7021
N01534 X.0004 Y-2.2334 I0 J-.7584
N01535 X.0004 Y-.6041 I0 J.8146
N01536 X.0004 Y-2.3459 I0 J-.8709
N01537 X.0004 Y-2.3459 I0 J.899
N01538 G01 Y-2.2459
N01539 G00 Z-.3144
N01540 Y-1.5584
N01541 G01 Z-.4438 F6.
N01542 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01543 X.0004 Y-1.2791 I0 J.1396
N01544 X.0004 Y-1.6709 I0 J-.1959
N01545 X.0004 Y-1.1666 I0 J.2521
N01546 X.0004 Y-1.7834 I0 J-.3084
N01547 X.0004 Y-1.0541 I0 J.3646
N01548 X.0004 Y-1.8959 I0 J-.4209
N01549 X.0004 Y-.9416 I0 J.4771
N01550 X.0004 Y-2.0084 I0 J-.5334
N01551 X.0004 Y-.8291 I0 J.5896
N01552 X.0004 Y-2.1209 I0 J-.6459
N01553 X.0004 Y-.7166 I0 J.7021
N01554 X.0004 Y-2.2334 I0 J-.7584
N01555 X.0004 Y-.6041 I0 J.8146
N01556 X.0004 Y-2.3459 I0 J-.8709
N01557 X.0004 Y-2.3459 I0 J.899
N01558 G01 Y-2.2459
N01559 G00 Z-.3438
N01560 Y-1.5584
N01561 G01 Z-.4732 F6.
N01562 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01563 X.0004 Y-1.2791 I0 J.1396
N01564 X.0004 Y-1.6709 I0 J-.1959
N01565 X.0004 Y-1.1666 I0 J.2521
N01566 X.0004 Y-1.7834 I0 J-.3084
N01567 X.0004 Y-1.0541 I0 J.3646
N01568 X.0004 Y-1.8959 I0 J-.4209
N01569 X.0004 Y-.9416 I0 J.4771

N01570 X.0004 Y-2.0084 I0 J-.5334
N01571 X.0004 Y-.8291 I0 J.5896
N01572 X.0004 Y-2.1209 I0 J-.6459
N01573 X.0004 Y-.7166 I0 J.7021
N01574 X.0004 Y-2.2334 I0 J-.7584
N01575 X.0004 Y-.6041 I0 J.8146
N01576 X.0004 Y-2.3459 I0 J-.8709
N01577 X.0004 Y-2.3459 I0 J.899
N01578 G01 Y-2.2459
N01579 G00 Z-.3732
N01580 Y-1.5584
N01581 G01 Z-.5026 F6.
N01582 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01583 X.0004 Y-1.2791 I0 J.1396
N01584 X.0004 Y-1.6709 I0 J-.1959
N01585 X.0004 Y-1.1666 I0 J.2521
N01586 X.0004 Y-1.7834 I0 J-.3084
N01587 X.0004 Y-1.0541 I0 J.3646
N01588 X.0004 Y-1.8959 I0 J-.4209
N01589 X.0004 Y-.9416 I0 J.4771
N01590 X.0004 Y-2.0084 I0 J-.5334
N01591 X.0004 Y-.8291 I0 J.5896
N01592 X.0004 Y-2.1209 I0 J-.6459
N01593 X.0004 Y-.7166 I0 J.7021
N01594 X.0004 Y-2.2334 I0 J-.7584
N01595 X.0004 Y-.6041 I0 J.8146
N01596 X.0004 Y-2.3459 I0 J-.8709
N01597 X.0004 Y-2.3459 I0 J.899
N01598 G01 Y-2.2459
N01599 G00 Z-.4026
N01600 Y-1.5584
N01601 G01 Z-.532 F6.
N01602 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01603 X.0004 Y-1.2791 I0 J.1396
N01604 X.0004 Y-1.6709 I0 J-.1959
N01605 X.0004 Y-1.1666 I0 J.2521
N01606 X.0004 Y-1.7834 I0 J-.3084
N01607 X.0004 Y-1.0541 I0 J.3646
N01608 X.0004 Y-1.8959 I0 J-.4209
N01609 X.0004 Y-.9416 I0 J.4771
N01610 X.0004 Y-2.0084 I0 J-.5334
N01611 X.0004 Y-.8291 I0 J.5896
N01612 X.0004 Y-2.1209 I0 J-.6459
N01613 X.0004 Y-.7166 I0 J.7021
N01614 X.0004 Y-2.2334 I0 J-.7584
N01615 X.0004 Y-.6041 I0 J.8146
N01616 X.0004 Y-2.3459 I0 J-.8709
N01617 X.0004 Y-2.3459 I0 J.899
N01618 G01 Y-2.2459
N01619 G00 Z-.432
N01620 Y-1.5584
N01621 G01 Z-.5614 F6.
N01622 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01623 X.0004 Y-1.2791 I0 J.1396
N01624 X.0004 Y-1.6709 I0 J-.1959
N01625 X.0004 Y-1.1666 I0 J.2521
N01626 X.0004 Y-1.7834 I0 J-.3084
N01627 X.0004 Y-1.0541 I0 J.3646
N01628 X.0004 Y-1.8959 I0 J-.4209
N01629 X.0004 Y-.9416 I0 J.4771
N01630 X.0004 Y-2.0084 I0 J-.5334
N01631 X.0004 Y-.8291 I0 J.5896
N01632 X.0004 Y-2.1209 I0 J-.6459
N01633 X.0004 Y-.7166 I0 J.7021
N01634 X.0004 Y-2.2334 I0 J-.7584
N01635 X.0004 Y-.6041 I0 J.8146
N01636 X.0004 Y-2.3459 I0 J-.8709
N01637 X.0004 Y-2.3459 I0 J.899
N01638 G01 Y-2.2459
N01639 G00 Z-.4614
N01640 Y-1.5584
N01641 G01 Z-.5907 F6.
N01642 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01643 X.0004 Y-1.2791 I0 J.1396
N01644 X.0004 Y-1.6709 I0 J-.1959
N01645 X.0004 Y-1.1666 I0 J.2521
N01646 X.0004 Y-1.7834 I0 J-.3084
N01647 X.0004 Y-1.0541 I0 J.3646
N01648 X.0004 Y-1.8959 I0 J-.4209
N01649 X.0004 Y-.9416 I0 J.4771
N01650 X.0004 Y-2.0084 I0 J-.5334
N01651 X.0004 Y-.8291 I0 J.5896
N01652 X.0004 Y-2.1209 I0 J-.6459
N01653 X.0004 Y-.7166 I0 J.7021
N01654 X.0004 Y-2.2334 I0 J-.7584
N01655 X.0004 Y-.6041 I0 J.8146
N01656 X.0004 Y-2.3459 I0 J-.8709
N01657 X.0004 Y-2.3459 I0 J.899

N01658 G01 Y-2.2459
N01659 G00 Z-.4907
N01660 Y-1.5584
N01661 G01 Z-.6201 F6.
N01662 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01663 X.0004 Y-1.2791 I0 J.1396
N01664 X.0004 Y-1.6709 I0 J-.1959
N01665 X.0004 Y-1.1666 I0 J.2521
N01666 X.0004 Y-1.7834 I0 J-.3084
N01667 X.0004 Y-1.0541 I0 J.3646
N01668 X.0004 Y-1.8959 I0 J-.4209
N01669 X.0004 Y-.9416 I0 J.4771
N01670 X.0004 Y-2.0084 I0 J-.5334
N01671 X.0004 Y-.8291 I0 J.5896
N01672 X.0004 Y-2.1209 I0 J-.6459
N01673 X.0004 Y-.7166 I0 J.7021
N01674 X.0004 Y-2.2334 I0 J-.7584
N01675 X.0004 Y-.6041 I0 J.8146
N01676 X.0004 Y-2.3459 I0 J-.8709
N01677 X.0004 Y-2.3459 I0 J.899
N01678 G01 Y-2.2459
N01679 G00 Z-.5201
N01680 Y-1.5584
N01681 G01 Z-.6495 F6.
N01682 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01683 X.0004 Y-1.2791 I0 J.1396
N01684 X.0004 Y-1.6709 I0 J-.1959
N01685 X.0004 Y-1.1666 I0 J.2521
N01686 X.0004 Y-1.7834 I0 J-.3084
N01687 X.0004 Y-1.0541 I0 J.3646
N01688 X.0004 Y-1.8959 I0 J-.4209
N01689 X.0004 Y-.9416 I0 J.4771
N01690 X.0004 Y-2.0084 I0 J-.5334
N01691 X.0004 Y-.8291 I0 J.5896
N01692 X.0004 Y-2.1209 I0 J-.6459
N01693 X.0004 Y-.7166 I0 J.7021
N01694 X.0004 Y-2.2334 I0 J-.7584
N01695 X.0004 Y-.6041 I0 J.8146
N01696 X.0004 Y-2.3459 I0 J-.8709
N01697 X.0004 Y-2.3459 I0 J.899
N01698 G01 Y-2.2459
N01699 G00 Z-.5495
N01700 Y-1.5584
N01701 G01 Z-.6789 F6.
N01702 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01703 X.0004 Y-1.2791 I0 J.1396
N01704 X.0004 Y-1.6709 I0 J-.1959
N01705 X.0004 Y-1.1666 I0 J.2521
N01706 X.0004 Y-1.7834 I0 J-.3084
N01707 X.0004 Y-1.0541 I0 J.3646
N01708 X.0004 Y-1.8959 I0 J-.4209
N01709 X.0004 Y-.9416 I0 J.4771
N01710 X.0004 Y-2.0084 I0 J-.5334
N01711 X.0004 Y-.8291 I0 J.5896
N01712 X.0004 Y-2.1209 I0 J-.6459
N01713 X.0004 Y-.7166 I0 J.7021
N01714 X.0004 Y-2.2334 I0 J-.7584
N01715 X.0004 Y-.6041 I0 J.8146
N01716 X.0004 Y-2.3459 I0 J-.8709
N01717 X.0004 Y-2.3459 I0 J.899
N01718 G01 Y-2.2459
N01719 G00 Z-.5789
N01720 Y-1.5584
N01721 G01 Z-.7083 F6.
N01722 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01723 X.0004 Y-1.2791 I0 J.1396
N01724 X.0004 Y-1.6709 I0 J-.1959
N01725 X.0004 Y-1.1666 I0 J.2521
N01726 X.0004 Y-1.7834 I0 J-.3084
N01727 X.0004 Y-1.0541 I0 J.3646
N01728 X.0004 Y-1.8959 I0 J-.4209
N01729 X.0004 Y-.9416 I0 J.4771
N01730 X.0004 Y-2.0084 I0 J-.5334
N01731 X.0004 Y-.8291 I0 J.5896
N01732 X.0004 Y-2.1209 I0 J-.6459
N01733 X.0004 Y-.7166 I0 J.7021
N01734 X.0004 Y-2.2334 I0 J-.7584
N01735 X.0004 Y-.6041 I0 J.8146
N01736 X.0004 Y-2.3459 I0 J-.8709
N01737 X.0004 Y-2.3459 I0 J.899
N01738 G01 Y-2.2459
N01739 G00 Z-.6083
N01740 Y-1.5584
N01741 G01 Z-.7377 F6.
N01742 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01743 X.0004 Y-1.2791 I0 J.1396
N01744 X.0004 Y-1.6709 I0 J-.1959
N01745 X.0004 Y-1.1666 I0 J.2521

N01746 X.0004 Y-1.7834 I0 J-.3084
N01747 X.0004 Y-1.0541 I0 J.3646
N01748 X.0004 Y-1.8959 I0 J-.4209
N01749 X.0004 Y-.9416 I0 J.4771
N01750 X.0004 Y-2.0084 I0 J-.5334
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N01752 X.0004 Y-2.1209 I0 J-.6459
N01753 X.0004 Y-.7166 I0 J.7021
N01754 X.0004 Y-2.2334 I0 J-.7584
N01755 X.0004 Y-.6041 I0 J.8146
N01756 X.0004 Y-2.3459 I0 J-.8709
N01757 X.0004 Y-2.3459 I0 J.899
N01758 G01 Y-2.2459
N01759 G00 Z-.6377
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N01761 G01 Z-.767 F6.
N01762 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01763 X.0004 Y-1.2791 I0 J.1396
N01764 X.0004 Y-1.6709 I0 J-.1959
N01765 X.0004 Y-1.1666 I0 J.2521
N01766 X.0004 Y-1.7834 I0 J-.3084
N01767 X.0004 Y-1.0541 I0 J.3646
N01768 X.0004 Y-1.8959 I0 J-.4209
N01769 X.0004 Y-.9416 I0 J.4771
N01770 X.0004 Y-2.0084 I0 J-.5334
N01771 X.0004 Y-.8291 I0 J.5896
N01772 X.0004 Y-2.1209 I0 J-.6459
N01773 X.0004 Y-.7166 I0 J.7021
N01774 X.0004 Y-2.2334 I0 J-.7584
N01775 X.0004 Y-.6041 I0 J.8146
N01776 X.0004 Y-2.3459 I0 J-.8709
N01777 X.0004 Y-2.3459 I0 J.899
N01778 G01 Y-2.2459
N01779 G00 Z-.667
N01780 Y-1.5584
N01781 G01 Z-.7964 F6.
N01782 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01783 X.0004 Y-1.2791 I0 J.1396
N01784 X.0004 Y-1.6709 I0 J-.1959
N01785 X.0004 Y-1.1666 I0 J.2521
N01786 X.0004 Y-1.7834 I0 J-.3084
N01787 X.0004 Y-1.0541 I0 J.3646
N01788 X.0004 Y-1.8959 I0 J-.4209
N01789 X.0004 Y-.9416 I0 J.4771
N01790 X.0004 Y-2.0084 I0 J-.5334
N01791 X.0004 Y-.8291 I0 J.5896
N01792 X.0004 Y-2.1209 I0 J-.6459
N01793 X.0004 Y-.7166 I0 J.7021
N01794 X.0004 Y-2.2334 I0 J-.7584
N01795 X.0004 Y-.6041 I0 J.8146
N01796 X.0004 Y-2.3459 I0 J-.8709
N01797 X.0004 Y-2.3459 I0 J.899
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N01799 G00 Z-.6964
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N01801 G01 Z-.8258 F6.
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N01804 X.0004 Y-1.6709 I0 J-.1959
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N01806 X.0004 Y-1.7834 I0 J-.3084
N01807 X.0004 Y-1.0541 I0 J.3646
N01808 X.0004 Y-1.8959 I0 J-.4209
N01809 X.0004 Y-.9416 I0 J.4771
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N01811 X.0004 Y-.8291 I0 J.5896
N01812 X.0004 Y-2.1209 I0 J-.6459
N01813 X.0004 Y-.7166 I0 J.7021
N01814 X.0004 Y-2.2334 I0 J-.7584
N01815 X.0004 Y-.6041 I0 J.8146
N01816 X.0004 Y-2.3459 I0 J-.8709
N01817 X.0004 Y-2.3459 I0 J.899
N01818 G01 Y-2.2459
N01819 G00 Z-.7258
N01820 Y-1.5584
N01821 G01 Z-.8552 F6.
N01822 G03 X.0004 Y-1.5584 I0 J.1115 F24.
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N01824 X.0004 Y-1.6709 I0 J-.1959
N01825 X.0004 Y-1.1666 I0 J.2521
N01826 X.0004 Y-1.7834 I0 J-.3084
N01827 X.0004 Y-1.0541 I0 J.3646
N01828 X.0004 Y-1.8959 I0 J-.4209
N01829 X.0004 Y-.9416 I0 J.4771
N01830 X.0004 Y-2.0084 I0 J-.5334
N01831 X.0004 Y-.8291 I0 J.5896
N01832 X.0004 Y-2.1209 I0 J-.6459
N01833 X.0004 Y-.7166 I0 J.7021

N01834 X.0004 Y-2.2334 I0 J-.7584
N01835 X.0004 Y-.6041 I0 J.8146
N01836 X.0004 Y-2.3459 I0 J-.8709
N01837 X.0004 Y-2.3459 I0 J.899
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N01839 G00 Z-.7552
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N01841 G01 Z-.8846 F6.
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N01844 X.0004 Y-1.6709 I0 J-.1959
N01845 X.0004 Y-1.1666 I0 J.2521
N01846 X.0004 Y-1.7834 I0 J-.3084
N01847 X.0004 Y-1.0541 I0 J.3646
N01848 X.0004 Y-1.8959 I0 J-.4209
N01849 X.0004 Y-.9416 I0 J.4771
N01850 X.0004 Y-2.0084 I0 J-.5334
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N01853 X.0004 Y-.7166 I0 J.7021
N01854 X.0004 Y-2.2334 I0 J-.7584
N01855 X.0004 Y-.6041 I0 J.8146
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N01857 X.0004 Y-2.3459 I0 J.899
N01858 G01 Y-2.2459
N01859 G00 Z-.7846
N01860 Y-1.5584
N01861 G01 Z-.914 F6.
N01862 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01863 X.0004 Y-1.2791 I0 J.1396
N01864 X.0004 Y-1.6709 I0 J-.1959
N01865 X.0004 Y-1.1666 I0 J.2521
N01866 X.0004 Y-1.7834 I0 J-.3084
N01867 X.0004 Y-1.0541 I0 J.3646
N01868 X.0004 Y-1.8959 I0 J-.4209
N01869 X.0004 Y-.9416 I0 J.4771
N01870 X.0004 Y-2.0084 I0 J-.5334
N01871 X.0004 Y-.8291 I0 J.5896
N01872 X.0004 Y-2.1209 I0 J-.6459
N01873 X.0004 Y-.7166 I0 J.7021
N01874 X.0004 Y-2.2334 I0 J-.7584
N01875 X.0004 Y-.6041 I0 J.8146
N01876 X.0004 Y-2.3459 I0 J-.8709
N01877 X.0004 Y-2.3459 I0 J.899
N01878 G01 Y-2.2459
N01879 G00 Z-.814
N01880 Y-1.5584
N01881 G01 Z-.9433 F6.
N01882 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01883 X.0004 Y-1.2791 I0 J.1396
N01884 X.0004 Y-1.6709 I0 J-.1959
N01885 X.0004 Y-1.1666 I0 J.2521
N01886 X.0004 Y-1.7834 I0 J-.3084
N01887 X.0004 Y-1.0541 I0 J.3646
N01888 X.0004 Y-1.8959 I0 J-.4209
N01889 X.0004 Y-.9416 I0 J.4771
N01890 X.0004 Y-2.0084 I0 J-.5334
N01891 X.0004 Y-.8291 I0 J.5896
N01892 X.0004 Y-2.1209 I0 J-.6459
N01893 X.0004 Y-.7166 I0 J.7021
N01894 X.0004 Y-2.2334 I0 J-.7584
N01895 X.0004 Y-.6041 I0 J.8146
N01896 X.0004 Y-2.3459 I0 J-.8709
N01897 X.0004 Y-2.3459 I0 J.899
N01898 G01 Y-2.2459
N01899 G00 Z-.8433
N01900 Y-1.5584
N01901 G01 Z-.9727 F6.
N01902 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01903 X.0004 Y-1.2791 I0 J.1396
N01904 X.0004 Y-1.6709 I0 J-.1959
N01905 X.0004 Y-1.1666 I0 J.2521
N01906 X.0004 Y-1.7834 I0 J-.3084
N01907 X.0004 Y-1.0541 I0 J.3646
N01908 X.0004 Y-1.8959 I0 J-.4209
N01909 X.0004 Y-.9416 I0 J.4771
N01910 X.0004 Y-2.0084 I0 J-.5334
N01911 X.0004 Y-.8291 I0 J.5896
N01912 X.0004 Y-2.1209 I0 J-.6459
N01913 X.0004 Y-.7166 I0 J.7021
N01914 X.0004 Y-2.2334 I0 J-.7584
N01915 X.0004 Y-.6041 I0 J.8146
N01916 X.0004 Y-2.3459 I0 J-.8709
N01917 X.0004 Y-2.3459 I0 J.899
N01918 G01 Y-2.2459
N01919 G00 Z-.8727
N01920 Y-1.5584
N01921 G01 Z-1.0021 F6.

N01922 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01923 X.0004 Y-1.2791 I0 J.1396
N01924 X.0004 Y-1.6709 I0 J-.1959
N01925 X.0004 Y-1.1666 I0 J.2521
N01926 X.0004 Y-1.7834 I0 J-.3084
N01927 X.0004 Y-1.0541 I0 J.3646
N01928 X.0004 Y-1.8959 I0 J-.4209
N01929 X.0004 Y-.9416 I0 J.4771
N01930 X.0004 Y-2.0084 I0 J-.5334
N01931 X.0004 Y-.8291 I0 J.5896
N01932 X.0004 Y-2.1209 I0 J-.6459
N01933 X.0004 Y-.7166 I0 J.7021
N01934 X.0004 Y-2.2334 I0 J-.7584
N01935 X.0004 Y-.6041 I0 J.8146
N01936 X.0004 Y-2.3459 I0 J-.8709
N01937 X.0004 Y-2.3459 I0 J.899
N01938 G01 Y-2.2459
N01939 G00 Z-.9021
N01940 Y-1.5584
N01941 G01 Z-1.0315 F6.
N01942 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01943 X.0004 Y-1.2791 I0 J.1396
N01944 X.0004 Y-1.6709 I0 J-.1959
N01945 X.0004 Y-1.1666 I0 J.2521
N01946 X.0004 Y-1.7834 I0 J-.3084
N01947 X.0004 Y-1.0541 I0 J.3646
N01948 X.0004 Y-1.8959 I0 J-.4209
N01949 X.0004 Y-.9416 I0 J.4771
N01950 X.0004 Y-2.0084 I0 J-.5334
N01951 X.0004 Y-.8291 I0 J.5896
N01952 X.0004 Y-2.1209 I0 J-.6459
N01953 X.0004 Y-.7166 I0 J.7021
N01954 X.0004 Y-2.2334 I0 J-.7584
N01955 X.0004 Y-.6041 I0 J.8146
N01956 X.0004 Y-2.3459 I0 J-.8709
N01957 X.0004 Y-2.3459 I0 J.899
N01958 G01 Y-2.2459
N01959 G00 Z-.9315
N01960 Y-1.5584
N01961 G01 Z-1.0609 F6.
N01962 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01963 X.0004 Y-1.2791 I0 J.1396
N01964 X.0004 Y-1.6709 I0 J-.1959
N01965 X.0004 Y-1.1666 I0 J.2521
N01966 X.0004 Y-1.7834 I0 J-.3084
N01967 X.0004 Y-1.0541 I0 J.3646
N01968 X.0004 Y-1.8959 I0 J-.4209
N01969 X.0004 Y-.9416 I0 J.4771
N01970 X.0004 Y-2.0084 I0 J-.5334
N01971 X.0004 Y-.8291 I0 J.5896
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N01973 X.0004 Y-.7166 I0 J.7021
N01974 X.0004 Y-2.2334 I0 J-.7584
N01975 X.0004 Y-.6041 I0 J.8146
N01976 X.0004 Y-2.3459 I0 J-.8709
N01977 X.0004 Y-2.3459 I0 J.899
N01978 G01 Y-2.2459
N01979 G00 Z-.9609
N01980 Y-1.5584
N01981 G01 Z-1.0903 F6.
N01982 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N01983 X.0004 Y-1.2791 I0 J.1396
N01984 X.0004 Y-1.6709 I0 J-.1959
N01985 X.0004 Y-1.1666 I0 J.2521
N01986 X.0004 Y-1.7834 I0 J-.3084
N01987 X.0004 Y-1.0541 I0 J.3646
N01988 X.0004 Y-1.8959 I0 J-.4209
N01989 X.0004 Y-.9416 I0 J.4771
N01990 X.0004 Y-2.0084 I0 J-.5334
N01991 X.0004 Y-.8291 I0 J.5896
N01992 X.0004 Y-2.1209 I0 J-.6459
N01993 X.0004 Y-.7166 I0 J.7021
N01994 X.0004 Y-2.2334 I0 J-.7584
N01995 X.0004 Y-.6041 I0 J.8146
N01996 X.0004 Y-2.3459 I0 J-.8709
N01997 X.0004 Y-2.3459 I0 J.899
N01998 G01 Y-2.2459
N01999 G00 Z-.9903
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N02001 G01 Z-1.1196 F6.
N02002 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02003 X.0004 Y-1.2791 I0 J.1396
N02004 X.0004 Y-1.6709 I0 J-.1959
N02005 X.0004 Y-1.1666 I0 J.2521
N02006 X.0004 Y-1.7834 I0 J-.3084
N02007 X.0004 Y-1.0541 I0 J.3646
N02008 X.0004 Y-1.8959 I0 J-.4209
N02009 X.0004 Y-.9416 I0 J.4771

N02010 X.0004 Y-2.0084 I0 J-.5334
N02011 X.0004 Y-.8291 I0 J.5896
N02012 X.0004 Y-2.1209 I0 J-.6459
N02013 X.0004 Y-.7166 I0 J.7021
N02014 X.0004 Y-2.2334 I0 J-.7584
N02015 X.0004 Y-.6041 I0 J.8146
N02016 X.0004 Y-2.3459 I0 J-.8709
N02017 X.0004 Y-2.3459 I0 J.899
N02018 G01 Y-2.2459
N02019 G00 Z-1.0196
N02020 Y-1.5584
N02021 G01 Z-1.149 F6.
N02022 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02023 X.0004 Y-1.2791 I0 J.1396
N02024 X.0004 Y-1.6709 I0 J-.1959
N02025 X.0004 Y-1.1666 I0 J.2521
N02026 X.0004 Y-1.7834 I0 J-.3084
N02027 X.0004 Y-1.0541 I0 J.3646
N02028 X.0004 Y-1.8959 I0 J-.4209
N02029 X.0004 Y-.9416 I0 J.4771
N02030 X.0004 Y-2.0084 I0 J-.5334
N02031 X.0004 Y-.8291 I0 J.5896
N02032 X.0004 Y-2.1209 I0 J-.6459
N02033 X.0004 Y-.7166 I0 J.7021
N02034 X.0004 Y-2.2334 I0 J-.7584
N02035 X.0004 Y-.6041 I0 J.8146
N02036 X.0004 Y-2.3459 I0 J-.8709
N02037 X.0004 Y-2.3459 I0 J.899
N02038 G01 Y-2.2459
N02039 G00 Z-1.049
N02040 Y-1.5584
N02041 G01 Z-1.1784 F6.
N02042 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02043 X.0004 Y-1.2791 I0 J.1396
N02044 X.0004 Y-1.6709 I0 J-.1959
N02045 X.0004 Y-1.1666 I0 J.2521
N02046 X.0004 Y-1.7834 I0 J-.3084
N02047 X.0004 Y-1.0541 I0 J.3646
N02048 X.0004 Y-1.8959 I0 J-.4209
N02049 X.0004 Y-.9416 I0 J.4771
N02050 X.0004 Y-2.0084 I0 J-.5334
N02051 X.0004 Y-.8291 I0 J.5896
N02052 X.0004 Y-2.1209 I0 J-.6459
N02053 X.0004 Y-.7166 I0 J.7021
N02054 X.0004 Y-2.2334 I0 J-.7584
N02055 X.0004 Y-.6041 I0 J.8146
N02056 X.0004 Y-2.3459 I0 J-.8709
N02057 X.0004 Y-2.3459 I0 J.899
N02058 G01 Y-2.2459
N02059 G00 Z-1.0784
N02060 Y-1.5584
N02061 G01 Z-1.2078 F6.
N02062 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02063 X.0004 Y-1.2791 I0 J.1396
N02064 X.0004 Y-1.6709 I0 J-.1959
N02065 X.0004 Y-1.1666 I0 J.2521
N02066 X.0004 Y-1.7834 I0 J-.3084
N02067 X.0004 Y-1.0541 I0 J.3646
N02068 X.0004 Y-1.8959 I0 J-.4209
N02069 X.0004 Y-.9416 I0 J.4771
N02070 X.0004 Y-2.0084 I0 J-.5334
N02071 X.0004 Y-.8291 I0 J.5896
N02072 X.0004 Y-2.1209 I0 J-.6459
N02073 X.0004 Y-.7166 I0 J.7021
N02074 X.0004 Y-2.2334 I0 J-.7584
N02075 X.0004 Y-.6041 I0 J.8146
N02076 X.0004 Y-2.3459 I0 J-.8709
N02077 X.0004 Y-2.3459 I0 J.899
N02078 G01 Y-2.2459
N02079 G00 Z-1.1078
N02080 Y-1.5584
N02081 G01 Z-1.2372 F6.
N02082 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02083 X.0004 Y-1.2791 I0 J.1396
N02084 X.0004 Y-1.6709 I0 J-.1959
N02085 X.0004 Y-1.1666 I0 J.2521
N02086 X.0004 Y-1.7834 I0 J-.3084
N02087 X.0004 Y-1.0541 I0 J.3646
N02088 X.0004 Y-1.8959 I0 J-.4209
N02089 X.0004 Y-.9416 I0 J.4771
N02090 X.0004 Y-2.0084 I0 J-.5334
N02091 X.0004 Y-.8291 I0 J.5896
N02092 X.0004 Y-2.1209 I0 J-.6459
N02093 X.0004 Y-.7166 I0 J.7021
N02094 X.0004 Y-2.2334 I0 J-.7584
N02095 X.0004 Y-.6041 I0 J.8146
N02096 X.0004 Y-2.3459 I0 J-.8709
N02097 X.0004 Y-2.3459 I0 J.899

N02098 G01 Y-2.2459
N02099 G00 Z-1.1372
N02100 Y-1.5584
N02101 G01 Z-1.2666 F6.
N02102 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02103 X.0004 Y-1.2791 I0 J.1396
N02104 X.0004 Y-1.6709 I0 J-.1959
N02105 X.0004 Y-1.1666 I0 J.2521
N02106 X.0004 Y-1.7834 I0 J-.3084
N02107 X.0004 Y-1.0541 I0 J.3646
N02108 X.0004 Y-1.8959 I0 J-.4209
N02109 X.0004 Y-.9416 I0 J.4771
N02110 X.0004 Y-2.0084 I0 J-.5334
N02111 X.0004 Y-.8291 I0 J.5896
N02112 X.0004 Y-2.1209 I0 J-.6459
N02113 X.0004 Y-.7166 I0 J.7021
N02114 X.0004 Y-2.2334 I0 J-.7584
N02115 X.0004 Y-.6041 I0 J.8146
N02116 X.0004 Y-2.3459 I0 J-.8709
N02117 X.0004 Y-2.3459 I0 J.899
N02118 G01 Y-2.2459
N02119 G00 Z-1.1666
N02120 Y-1.5584
N02121 G01 Z-1.2959 F6.
N02122 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02123 X.0004 Y-1.2791 I0 J.1396
N02124 X.0004 Y-1.6709 I0 J-.1959
N02125 X.0004 Y-1.1666 I0 J.2521
N02126 X.0004 Y-1.7834 I0 J-.3084
N02127 X.0004 Y-1.0541 I0 J.3646
N02128 X.0004 Y-1.8959 I0 J-.4209
N02129 X.0004 Y-.9416 I0 J.4771
N02130 X.0004 Y-2.0084 I0 J-.5334
N02131 X.0004 Y-.8291 I0 J.5896
N02132 X.0004 Y-2.1209 I0 J-.6459
N02133 X.0004 Y-.7166 I0 J.7021
N02134 X.0004 Y-2.2334 I0 J-.7584
N02135 X.0004 Y-.6041 I0 J.8146
N02136 X.0004 Y-2.3459 I0 J-.8709
N02137 X.0004 Y-2.3459 I0 J.899
N02138 G01 Y-2.2459
N02139 G00 Z-1.1959
N02140 Y-1.5584
N02141 G01 Z-1.3253 F6.
N02142 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02143 X.0004 Y-1.2791 I0 J.1396
N02144 X.0004 Y-1.6709 I0 J-.1959
N02145 X.0004 Y-1.1666 I0 J.2521
N02146 X.0004 Y-1.7834 I0 J-.3084
N02147 X.0004 Y-1.0541 I0 J.3646
N02148 X.0004 Y-1.8959 I0 J-.4209
N02149 X.0004 Y-.9416 I0 J.4771
N02150 X.0004 Y-2.0084 I0 J-.5334
N02151 X.0004 Y-.8291 I0 J.5896
N02152 X.0004 Y-2.1209 I0 J-.6459
N02153 X.0004 Y-.7166 I0 J.7021
N02154 X.0004 Y-2.2334 I0 J-.7584
N02155 X.0004 Y-.6041 I0 J.8146
N02156 X.0004 Y-2.3459 I0 J-.8709
N02157 X.0004 Y-2.3459 I0 J.899
N02158 G01 Y-2.2459
N02159 G00 Z-1.2253
N02160 Y-1.5584
N02161 G01 Z-1.3547 F6.
N02162 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02163 X.0004 Y-1.2791 I0 J.1396
N02164 X.0004 Y-1.6709 I0 J-.1959
N02165 X.0004 Y-1.1666 I0 J.2521
N02166 X.0004 Y-1.7834 I0 J-.3084
N02167 X.0004 Y-1.0541 I0 J.3646
N02168 X.0004 Y-1.8959 I0 J-.4209
N02169 X.0004 Y-.9416 I0 J.4771
N02170 X.0004 Y-2.0084 I0 J-.5334
N02171 X.0004 Y-.8291 I0 J.5896
N02172 X.0004 Y-2.1209 I0 J-.6459
N02173 X.0004 Y-.7166 I0 J.7021
N02174 X.0004 Y-2.2334 I0 J-.7584
N02175 X.0004 Y-.6041 I0 J.8146
N02176 X.0004 Y-2.3459 I0 J-.8709
N02177 X.0004 Y-2.3459 I0 J.899
N02178 G01 Y-2.2459
N02179 G00 Z-1.2547
N02180 Y-1.5584
N02181 G01 Z-1.3841 F6.
N02182 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02183 X.0004 Y-1.2791 I0 J.1396
N02184 X.0004 Y-1.6709 I0 J-.1959
N02185 X.0004 Y-1.1666 I0 J.2521

N02186 X.0004 Y-1.7834 I0 J-.3084
N02187 X.0004 Y-1.0541 I0 J.3646
N02188 X.0004 Y-1.8959 I0 J-.4209
N02189 X.0004 Y-.9416 I0 J.4771
N02190 X.0004 Y-2.0084 I0 J-.5334
N02191 X.0004 Y-.8291 I0 J.5896
N02192 X.0004 Y-2.1209 I0 J-.6459
N02193 X.0004 Y-.7166 I0 J.7021
N02194 X.0004 Y-2.2334 I0 J-.7584
N02195 X.0004 Y-.6041 I0 J.8146
N02196 X.0004 Y-2.3459 I0 J-.8709
N02197 X.0004 Y-2.3459 I0 J.899
N02198 G01 Y-2.2459
N02199 G00 Z-1.2841
N02200 Y-1.5584
N02201 G01 Z-1.4135 F6.
N02202 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02203 X.0004 Y-1.2791 I0 J.1396
N02204 X.0004 Y-1.6709 I0 J-.1959
N02205 X.0004 Y-1.1666 I0 J.2521
N02206 X.0004 Y-1.7834 I0 J-.3084
N02207 X.0004 Y-1.0541 I0 J.3646
N02208 X.0004 Y-1.8959 I0 J-.4209
N02209 X.0004 Y-.9416 I0 J.4771
N02210 X.0004 Y-2.0084 I0 J-.5334
N02211 X.0004 Y-.8291 I0 J.5896
N02212 X.0004 Y-2.1209 I0 J-.6459
N02213 X.0004 Y-.7166 I0 J.7021
N02214 X.0004 Y-2.2334 I0 J-.7584
N02215 X.0004 Y-.6041 I0 J.8146
N02216 X.0004 Y-2.3459 I0 J-.8709
N02217 X.0004 Y-2.3459 I0 J.899
N02218 G01 Y-2.2459
N02219 G00 Z-1.3135
N02220 Y-1.5584
N02221 G01 Z-1.4429 F6.
N02222 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02223 X.0004 Y-1.2791 I0 J.1396
N02224 X.0004 Y-1.6709 I0 J-.1959
N02225 X.0004 Y-1.1666 I0 J.2521
N02226 X.0004 Y-1.7834 I0 J-.3084
N02227 X.0004 Y-1.0541 I0 J.3646
N02228 X.0004 Y-1.8959 I0 J-.4209
N02229 X.0004 Y-.9416 I0 J.4771
N02230 X.0004 Y-2.0084 I0 J-.5334
N02231 X.0004 Y-.8291 I0 J.5896
N02232 X.0004 Y-2.1209 I0 J-.6459
N02233 X.0004 Y-.7166 I0 J.7021
N02234 X.0004 Y-2.2334 I0 J-.7584
N02235 X.0004 Y-.6041 I0 J.8146
N02236 X.0004 Y-2.3459 I0 J-.8709
N02237 X.0004 Y-2.3459 I0 J.899
N02238 G01 Y-2.2459
N02239 G00 Z-1.3429
N02240 Y-1.5584
N02241 G01 Z-1.4722 F6.
N02242 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02243 X.0004 Y-1.2791 I0 J.1396
N02244 X.0004 Y-1.6709 I0 J-.1959
N02245 X.0004 Y-1.1666 I0 J.2521
N02246 X.0004 Y-1.7834 I0 J-.3084
N02247 X.0004 Y-1.0541 I0 J.3646
N02248 X.0004 Y-1.8959 I0 J-.4209
N02249 X.0004 Y-.9416 I0 J.4771
N02250 X.0004 Y-2.0084 I0 J-.5334
N02251 X.0004 Y-.8291 I0 J.5896
N02252 X.0004 Y-2.1209 I0 J-.6459
N02253 X.0004 Y-.7166 I0 J.7021
N02254 X.0004 Y-2.2334 I0 J-.7584
N02255 X.0004 Y-.6041 I0 J.8146
N02256 X.0004 Y-2.3459 I0 J-.8709
N02257 X.0004 Y-2.3459 I0 J.899
N02258 G01 Y-2.2459
N02259 G00 Z-1.3722
N02260 Y-1.5584
N02261 G01 Z-1.5016 F6.
N02262 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02263 X.0004 Y-1.2791 I0 J.1396
N02264 X.0004 Y-1.6709 I0 J-.1959
N02265 X.0004 Y-1.1666 I0 J.2521
N02266 X.0004 Y-1.7834 I0 J-.3084
N02267 X.0004 Y-1.0541 I0 J.3646
N02268 X.0004 Y-1.8959 I0 J-.4209
N02269 X.0004 Y-.9416 I0 J.4771
N02270 X.0004 Y-2.0084 I0 J-.5334
N02271 X.0004 Y-.8291 I0 J.5896
N02272 X.0004 Y-2.1209 I0 J-.6459
N02273 X.0004 Y-.7166 I0 J.7021

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N02274 X.0004 Y-2.2334 I0 J-.7584
N02275 X.0004 Y-.6041 I0 J.8146
N02276 X.0004 Y-2.3459 I0 J-.8709
N02277 X.0004 Y-2.3459 I0 J.899
N02278 G01 Y-2.2459
N02279 G00 Z-1.4016
N02280 Y-1.5584
N02281 G01 Z-1.531 F6.
N02282 G03 X.0004 Y-1.5584 I0 J.1115 F24.
N02283 X.0004 Y-1.2791 I0 J.1396
N02284 X.0004 Y-1.6709 I0 J-.1959
N02285 X.0004 Y-1.1666 I0 J.2521
N02286 X.0004 Y-1.7834 I0 J-.3084
N02287 X.0004 Y-1.0541 I0 J.3646
N02288 X.0004 Y-1.8959 I0 J-.4209
N02289 X.0004 Y-.9416 I0 J.4771
N02290 X.0004 Y-2.0084 I0 J-.5334
N02291 X.0004 Y-.8291 I0 J.5896
N02292 X.0004 Y-2.1209 I0 J-.6459
N02293 X.0004 Y-.7166 I0 J.7021
N02294 X.0004 Y-2.2334 I0 J-.7584
N02295 X.0004 Y-.6041 I0 J.8146
N02296 X.0004 Y-2.3459 I0 J-.8709
N02297 X.0004 Y-2.3459 I0 J.899
N02298 G01 Y-2.2459
N02299 G00 Z.1
N02300 G00 Z.1
N02301 G00 G90
N02302 G00 G53 Z0.0
N02303 G00 G53 X-15. Y0.
N02304 M30
%
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C.11 Flange – Setup 6

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%
O0001 (Flange Setup 6)
(HAAS VF2 Toby Working)
(1/7/2011 4:33:47 PM)
(FIRST TOOLCHANGE)
(CHANGING TO TOOL FM 3 in )
(FACE MILL)
(No Approach Move)
N00001 G00 G40 G49 G80 G90
N00002 T01 M06
N00004 G43 H01 M08
N00005 S4000
N00006 M03
N00007 G00 X-6.0788 Y2.8149 (MOVE TO
FIRST X AND Y LOCATION)
(START OF OPERATION:  SolidMill - Facing )
N00008 G00 G54 (Assuming G54)
N00009 Z.1
N00010 X-6.0788 Y2.8149
N00011 G01 Z-.0473 F9.
N00012 X4.1334 F36.
N00013 X4.5271 Y1.3149
N00014 X-4.528
N00015 Y-.1851
N00016 X4.5271
N00017 Y-1.6851
N00018 X-4.528
N00019 X-.9847 Y-2.815
N00020 X6.0496
N00021 Z.0527 F9.
N00022 G00 X-6.0788 Y2.8149
N00023 G01 Z-.0947
N00024 X4.1334 F36.
N00025 X4.5271 Y1.3149
N00026 X-4.528
N00027 Y-.1851
N00028 X4.5271
N00029 Y-1.6851
N00030 X-4.528
N00031 X-.9847 Y-2.815
N00032 X6.0496
N00033 Z.0053 F9.
N00034 G00 X-6.0788 Y2.8149
N00035 G01 Z-.142
N00036 X4.1334 F36.
N00037 X4.5271 Y1.3149
N00038 X-4.528
N00039 Y-.1851
N00040 X4.5271
N00041 Y-1.6851
N00042 X-4.528
N00043 X-.9847 Y-2.815
N00044 X6.0496
N00045 Z-.042 F9.
N00046 G00 Z.1
(LAST TOOLCHANGE)
(CHANGING TO TOOL EM 0.375 in )
(No Approach Move)
N00047 M05
N00048 M09
N00049 G00 G40 G49 G80 G90
N00050 T02 M06
N00052 G43 H02 M08
N00053 S4000
N00054 M03
N00055 G00 X-2.9532 Y1.1971 (MOVE TO
FIRST X AND Y LOCATION)
(START OF OPERATION:  SolidMill -
Pocketing )
N00056 G00 G54 (Assuming G54)
N00057 X-2.9532 Y1.1971
N00058 Z.1
N00059 Z-.025
N00060 G01 Z-.1733 F6.4
N00061 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00062 X-2.9532 Y1.3301 I0 J.0665
N00063 X-2.9532 Y1.1033 I0 J-.1134
N00064 X-2.9532 Y1.4238 I0 J.1603
N00065 X-2.9532 Y1.0096 I0 J-.2071
N00066 X-2.9532 Y1.5176 I0 J.254
N00067 X-2.9532 Y.9158 I0 J-.3009
N00068 X-2.9532 Y.9158 I0 J.3243
N00069 G01 Y1.0158
N00070 G00 Z-.0733
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N00071 Y1.1971
N00072 G01 Z-.2215 F6.4
N00073 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00074 X-2.9532 Y1.3301 I0 J.0665
N00075 X-2.9532 Y1.1033 I0 J-.1134
N00076 X-2.9532 Y1.4238 I0 J.1603
N00077 X-2.9532 Y1.0096 I0 J-.2071
N00078 X-2.9532 Y1.5176 I0 J.254
N00079 X-2.9532 Y.9158 I0 J-.3009
N00080 X-2.9532 Y.9158 I0 J.3243
N00081 G01 Y1.0158
N00082 G00 Z-.1215
N00083 Y1.1971
N00084 G01 Z-.2698 F6.4
N00085 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00086 X-2.9532 Y1.3301 I0 J.0665
N00087 X-2.9532 Y1.1033 I0 J-.1134
N00088 X-2.9532 Y1.4238 I0 J.1603
N00089 X-2.9532 Y1.0096 I0 J-.2071
N00090 X-2.9532 Y1.5176 I0 J.254
N00091 X-2.9532 Y.9158 I0 J-.3009
N00092 X-2.9532 Y.9158 I0 J.3243
N00093 G01 Y1.0158
N00094 G00 Z-.1698
N00095 Y1.1971
N00096 G01 Z-.3181 F6.4
N00097 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00098 X-2.9532 Y1.3301 I0 J.0665
N00099 X-2.9532 Y1.1033 I0 J-.1134
N00100 X-2.9532 Y1.4238 I0 J.1603
N00101 X-2.9532 Y1.0096 I0 J-.2071
N00102 X-2.9532 Y1.5176 I0 J.254
N00103 X-2.9532 Y.9158 I0 J-.3009
N00104 X-2.9532 Y.9158 I0 J.3243
N00105 G01 Y1.0158
N00106 G00 Z-.2181
N00107 Y1.1971
N00108 G01 Z-.3663 F6.4
N00109 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00110 X-2.9532 Y1.3301 I0 J.0665
N00111 X-2.9532 Y1.1033 I0 J-.1134
N00112 X-2.9532 Y1.4238 I0 J.1603
N00113 X-2.9532 Y1.0096 I0 J-.2071
N00114 X-2.9532 Y1.5176 I0 J.254
N00115 X-2.9532 Y.9158 I0 J-.3009
N00116 X-2.9532 Y.9158 I0 J.3243
N00117 G01 Y1.0158
N00118 G00 Z-.2663
N00119 Y1.1971
N00120 G01 Z-.4146 F6.4
N00121 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00122 X-2.9532 Y1.3301 I0 J.0665
N00123 X-2.9532 Y1.1033 I0 J-.1134
N00124 X-2.9532 Y1.4238 I0 J.1603
N00125 X-2.9532 Y1.0096 I0 J-.2071
N00126 X-2.9532 Y1.5176 I0 J.254
N00127 X-2.9532 Y.9158 I0 J-.3009
N00128 X-2.9532 Y.9158 I0 J.3243
N00129 G01 Y1.0158
N00130 G00 Z-.3146
N00131 Y1.1971
N00132 G01 Z-.4628 F6.4
N00133 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00134 X-2.9532 Y1.3301 I0 J.0665
N00135 X-2.9532 Y1.1033 I0 J-.1134
N00136 X-2.9532 Y1.4238 I0 J.1603
N00137 X-2.9532 Y1.0096 I0 J-.2071
N00138 X-2.9532 Y1.5176 I0 J.254
N00139 X-2.9532 Y.9158 I0 J-.3009
N00140 X-2.9532 Y.9158 I0 J.3243
N00141 G01 Y1.0158
N00142 G00 Z-.3628
N00143 Y1.1971
N00144 G01 Z-.5111 F6.4
N00145 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00146 X-2.9532 Y1.3301 I0 J.0665
N00147 X-2.9532 Y1.1033 I0 J-.1134
N00148 X-2.9532 Y1.4238 I0 J.1603
N00149 X-2.9532 Y1.0096 I0 J-.2071
N00150 X-2.9532 Y1.5176 I0 J.254
N00151 X-2.9532 Y.9158 I0 J-.3009
N00152 X-2.9532 Y.9158 I0 J.3243
N00153 G01 Y1.0158
N00154 G00 Z-.4111
N00155 Y1.1971
N00156 G01 Z-.5594 F6.4
N00157 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00158 X-2.9532 Y1.3301 I0 J.0665

N00159 X-2.9532 Y1.1033 I0 J-.1134
N00160 X-2.9532 Y1.4238 I0 J.1603
N00161 X-2.9532 Y1.0096 I0 J-.2071
N00162 X-2.9532 Y1.5176 I0 J.254
N00163 X-2.9532 Y.9158 I0 J-.3009
N00164 X-2.9532 Y.9158 I0 J.3243
N00165 G01 Y1.0158
N00166 G00 Z-.4594
N00167 Y1.1971
N00168 G01 Z-.6076 F6.4
N00169 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00170 X-2.9532 Y1.3301 I0 J.0665
N00171 X-2.9532 Y1.1033 I0 J-.1134
N00172 X-2.9532 Y1.4238 I0 J.1603
N00173 X-2.9532 Y1.0096 I0 J-.2071
N00174 X-2.9532 Y1.5176 I0 J.254
N00175 X-2.9532 Y.9158 I0 J-.3009
N00176 X-2.9532 Y.9158 I0 J.3243
N00177 G01 Y1.0158
N00178 G00 Z-.5076
N00179 Y1.1971
N00180 G01 Z-.6559 F6.4
N00181 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00182 X-2.9532 Y1.3301 I0 J.0665
N00183 X-2.9532 Y1.1033 I0 J-.1134
N00184 X-2.9532 Y1.4238 I0 J.1603
N00185 X-2.9532 Y1.0096 I0 J-.2071
N00186 X-2.9532 Y1.5176 I0 J.254
N00187 X-2.9532 Y.9158 I0 J-.3009
N00188 X-2.9532 Y.9158 I0 J.3243
N00189 G01 Y1.0158
N00190 G00 Z-.5559
N00191 Y1.1971
N00192 G01 Z-.7042 F6.4
N00193 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00194 X-2.9532 Y1.3301 I0 J.0665
N00195 X-2.9532 Y1.1033 I0 J-.1134
N00196 X-2.9532 Y1.4238 I0 J.1603
N00197 X-2.9532 Y1.0096 I0 J-.2071
N00198 X-2.9532 Y1.5176 I0 J.254
N00199 X-2.9532 Y.9158 I0 J-.3009
N00200 X-2.9532 Y.9158 I0 J.3243
N00201 G01 Y1.0158
N00202 G00 Z-.6042
N00203 Y1.1971
N00204 G01 Z-.7524 F6.4
N00205 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00206 X-2.9532 Y1.3301 I0 J.0665
N00207 X-2.9532 Y1.1033 I0 J-.1134
N00208 X-2.9532 Y1.4238 I0 J.1603
N00209 X-2.9532 Y1.0096 I0 J-.2071
N00210 X-2.9532 Y1.5176 I0 J.254
N00211 X-2.9532 Y.9158 I0 J-.3009
N00212 X-2.9532 Y.9158 I0 J.3243
N00213 G01 Y1.0158
N00214 G00 Z-.6524
N00215 Y1.1971
N00216 G01 Z-.8007 F6.4
N00217 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00218 X-2.9532 Y1.3301 I0 J.0665
N00219 X-2.9532 Y1.1033 I0 J-.1134
N00220 X-2.9532 Y1.4238 I0 J.1603
N00221 X-2.9532 Y1.0096 I0 J-.2071
N00222 X-2.9532 Y1.5176 I0 J.254
N00223 X-2.9532 Y.9158 I0 J-.3009
N00224 X-2.9532 Y.9158 I0 J.3243
N00225 G01 Y1.0158
N00226 G00 Z-.7007
N00227 Y1.1971
N00228 G01 Z-.8489 F6.4
N00229 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00230 X-2.9532 Y1.3301 I0 J.0665
N00231 X-2.9532 Y1.1033 I0 J-.1134
N00232 X-2.9532 Y1.4238 I0 J.1603
N00233 X-2.9532 Y1.0096 I0 J-.2071
N00234 X-2.9532 Y1.5176 I0 J.254
N00235 X-2.9532 Y.9158 I0 J-.3009
N00236 X-2.9532 Y.9158 I0 J.3243
N00237 G01 Y1.0158
N00238 G00 Z-.7489
N00239 Y1.1971
N00240 G01 Z-.8972 F6.4
N00241 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00242 X-2.9532 Y1.3301 I0 J.0665
N00243 X-2.9532 Y1.1033 I0 J-.1134
N00244 X-2.9532 Y1.4238 I0 J.1603
N00245 X-2.9532 Y1.0096 I0 J-.2071
N00246 X-2.9532 Y1.5176 I0 J.254

N00247 X-2.9532 Y.9158 I0 J-.3009
N00248 X-2.9532 Y.9158 I0 J.3243
N00249 G01 Y1.0158
N00250 G00 Z-.7972
N00251 Y1.1971
N00252 G01 Z-.9455 F6.4
N00253 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00254 X-2.9532 Y1.3301 I0 J.0665
N00255 X-2.9532 Y1.1033 I0 J-.1134
N00256 X-2.9532 Y1.4238 I0 J.1603
N00257 X-2.9532 Y1.0096 I0 J-.2071
N00258 X-2.9532 Y1.5176 I0 J.254
N00259 X-2.9532 Y.9158 I0 J-.3009
N00260 X-2.9532 Y.9158 I0 J.3243
N00261 G01 Y1.0158
N00262 G00 Z-.8455
N00263 Y1.1971
N00264 G01 Z-.9937 F6.4
N00265 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00266 X-2.9532 Y1.3301 I0 J.0665
N00267 X-2.9532 Y1.1033 I0 J-.1134
N00268 X-2.9532 Y1.4238 I0 J.1603
N00269 X-2.9532 Y1.0096 I0 J-.2071
N00270 X-2.9532 Y1.5176 I0 J.254
N00271 X-2.9532 Y.9158 I0 J-.3009
N00272 X-2.9532 Y.9158 I0 J.3243
N00273 G01 Y1.0158
N00274 G00 Z-.8937
N00275 Y1.1971
N00276 G01 Z-1.1358 F6.4
N00277 G03 X-2.9532 Y1.1971 I0 J.043 F28.
N00278 X-2.9532 Y1.3301 I0 J.0665
N00279 X-2.9532 Y1.1033 I0 J-.1134
N00280 X-2.9532 Y1.4238 I0 J.1603
N00281 X-2.9532 Y1.0096 I0 J-.2071
N00282 X-2.9532 Y1.5176 I0 J.254
N00283 X-2.9532 Y.9158 I0 J-.3009
N00284 X-2.9532 Y.9158 I0 J.3243
N00285 G01 Y1.0158
N00286 G00 Z.1
(START OF OPERATION: SolidMill - Pocketing)
N00287 G00 G54 (Assuming G54)
N00288 X-2.9532 Y-1.7557
N00289 Z.1
N00290 Z-.025
N00291 G01 Z-.1733 F6.4
N00292 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00293 X-2.9532 Y-1.6227 I0 J.0665
N00294 X-2.9532 Y-1.8494 I0 J-.1134
N00295 X-2.9532 Y-1.529 I0 J.1602
N00296 X-2.9532 Y-1.9432 I0 J-.2071
N00297 X-2.9532 Y-1.4352 I0 J.254
N00298 X-2.9532 Y-2.0369 I0 J-.3009
N00299 X-2.9532 Y-2.0369 I0 J.3243
N00300 G01 Y-1.9369
N00301 G00 Z-.0733
N00302 Y-1.7557
N00303 G01 Z-.2215 F6.4
N00304 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00305 X-2.9532 Y-1.6227 I0 J.0665
N00306 X-2.9532 Y-1.8494 I0 J-.1134
N00307 X-2.9532 Y-1.529 I0 J.1602
N00308 X-2.9532 Y-1.9432 I0 J-.2071
N00309 X-2.9532 Y-1.4352 I0 J.254
N00310 X-2.9532 Y-2.0369 I0 J-.3009
N00311 X-2.9532 Y-2.0369 I0 J.3243
N00312 G01 Y-1.9369
N00313 G00 Z-.1215
N00314 Y-1.7557
N00315 G01 Z-.2698 F6.4
N00316 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00317 X-2.9532 Y-1.6227 I0 J.0665
N00318 X-2.9532 Y-1.8494 I0 J-.1134
N00319 X-2.9532 Y-1.529 I0 J.1602
N00320 X-2.9532 Y-1.9432 I0 J-.2071
N00321 X-2.9532 Y-1.4352 I0 J.254
N00322 X-2.9532 Y-2.0369 I0 J-.3009
N00323 X-2.9532 Y-2.0369 I0 J.3243
N00324 G01 Y-1.9369
N00325 G00 Z-.1698
N00326 Y-1.7557
N00327 G01 Z-.3181 F6.4
N00328 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.

N00329 X-2.9532 Y-1.6227 I0 J.0665
N00330 X-2.9532 Y-1.8494 I0 J-.1134
N00331 X-2.9532 Y-1.529 I0 J.1602
N00332 X-2.9532 Y-1.9432 I0 J-.2071
N00333 X-2.9532 Y-1.4352 I0 J.254
N00334 X-2.9532 Y-2.0369 I0 J-.3009
N00335 X-2.9532 Y-2.0369 I0 J.3243
N00336 G01 Y-1.9369
N00337 G00 Z-.2181
N00338 Y-1.7557
N00339 G01 Z-.3663 F6.4
N00340 G03 X-2.9532 Y-1.7557 I0 J.0431
F28.
N00341 X-2.9532 Y-1.6227 I0 J.0665
N00342 X-2.9532 Y-1.8494 I0 J-.1134
N00343 X-2.9532 Y-1.529 I0 J.1602
N00344 X-2.9532 Y-1.9432 I0 J-.2071
N00345 X-2.9532 Y-1.4352 I0 J.254
N00346 X-2.9532 Y-2.0369 I0 J-.3009
N00347 X-2.9532 Y-2.0369 I0 J.3243
N00348 G01 Y-1.9369
N00349 G00 Z-.2663
N00350 Y-1.7557
N00351 G01 Z-.4146 F6.4
N00352 G03 X-2.9532 Y-1.7557 I0 J.0431
F28.
N00353 X-2.9532 Y-1.6227 I0 J.0665
N00354 X-2.9532 Y-1.8494 I0 J-.1134
N00355 X-2.9532 Y-1.529 I0 J.1602
N00356 X-2.9532 Y-1.9432 I0 J-.2071
N00357 X-2.9532 Y-1.4352 I0 J.254
N00358 X-2.9532 Y-2.0369 I0 J-.3009
N00359 X-2.9532 Y-2.0369 I0 J.3243
N00360 G01 Y-1.9369
N00361 G00 Z-.3146
N00362 Y-1.7557
N00363 G01 Z-.4628 F6.4
N00364 G03 X-2.9532 Y-1.7557 I0 J.0431
F28.
N00365 X-2.9532 Y-1.6227 I0 J.0665
N00366 X-2.9532 Y-1.8494 I0 J-.1134
N00367 X-2.9532 Y-1.529 I0 J.1602
N00368 X-2.9532 Y-1.9432 I0 J-.2071
N00369 X-2.9532 Y-1.4352 I0 J.254
N00370 X-2.9532 Y-2.0369 I0 J-.3009
N00371 X-2.9532 Y-2.0369 I0 J.3243
N00372 G01 Y-1.9369
N00373 G00 Z-.3628
N00374 Y-1.7557
N00375 G01 Z-.5111 F6.4
N00376 G03 X-2.9532 Y-1.7557 I0 J.0431
F28.
N00377 X-2.9532 Y-1.6227 I0 J.0665
N00378 X-2.9532 Y-1.8494 I0 J-.1134
N00379 X-2.9532 Y-1.529 I0 J.1602
N00380 X-2.9532 Y-1.9432 I0 J-.2071
N00381 X-2.9532 Y-1.4352 I0 J.254
N00382 X-2.9532 Y-2.0369 I0 J-.3009
N00383 X-2.9532 Y-2.0369 I0 J.3243
N00384 G01 Y-1.9369
N00385 G00 Z-.4111
N00386 Y-1.7557
N00387 G01 Z-.5594 F6.4
N00388 G03 X-2.9532 Y-1.7557 I0 J.0431
F28.
N00389 X-2.9532 Y-1.6227 I0 J.0665
N00390 X-2.9532 Y-1.8494 I0 J-.1134
N00391 X-2.9532 Y-1.529 I0 J.1602
N00392 X-2.9532 Y-1.9432 I0 J-.2071
N00393 X-2.9532 Y-1.4352 I0 J.254
N00394 X-2.9532 Y-2.0369 I0 J-.3009
N00395 X-2.9532 Y-2.0369 I0 J.3243
N00396 G01 Y-1.9369
N00397 G00 Z-.4594
N00398 Y-1.7557
N00399 G01 Z-.6076 F6.4
N00400 G03 X-2.9532 Y-1.7557 I0 J.0431
F28.
N00401 X-2.9532 Y-1.6227 I0 J.0665
N00402 X-2.9532 Y-1.8494 I0 J-.1134
N00403 X-2.9532 Y-1.529 I0 J.1602
N00404 X-2.9532 Y-1.9432 I0 J-.2071
N00405 X-2.9532 Y-1.4352 I0 J.254
N00406 X-2.9532 Y-2.0369 I0 J-.3009
N00407 X-2.9532 Y-2.0369 I0 J.3243
N00408 G01 Y-1.9369
N00409 G00 Z-.5076
N00410 Y-1.7557

N00411 G01 Z-.6559 F6.4
N00412 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00413 X-2.9532 Y-1.6227 I0 J.0665
N00414 X-2.9532 Y-1.8494 I0 J-.1134
N00415 X-2.9532 Y-1.529 I0 J.1602
N00416 X-2.9532 Y-1.9432 I0 J-.2071
N00417 X-2.9532 Y-1.4352 I0 J.254
N00418 X-2.9532 Y-2.0369 I0 J-.3009
N00419 X-2.9532 Y-2.0369 I0 J.3243
N00420 G01 Y-1.9369
N00421 G00 Z-.5559
N00422 Y-1.7557
N00423 G01 Z-.7042 F6.4
N00424 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00425 X-2.9532 Y-1.6227 I0 J.0665
N00426 X-2.9532 Y-1.8494 I0 J-.1134
N00427 X-2.9532 Y-1.529 I0 J.1602
N00428 X-2.9532 Y-1.9432 I0 J-.2071
N00429 X-2.9532 Y-1.4352 I0 J.254
N00430 X-2.9532 Y-2.0369 I0 J-.3009
N00431 X-2.9532 Y-2.0369 I0 J.3243
N00432 G01 Y-1.9369
N00433 G00 Z-.6042
N00434 Y-1.7557
N00435 G01 Z-.7524 F6.4
N00436 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00437 X-2.9532 Y-1.6227 I0 J.0665
N00438 X-2.9532 Y-1.8494 I0 J-.1134
N00439 X-2.9532 Y-1.529 I0 J.1602
N00440 X-2.9532 Y-1.9432 I0 J-.2071
N00441 X-2.9532 Y-1.4352 I0 J.254
N00442 X-2.9532 Y-2.0369 I0 J-.3009
N00443 X-2.9532 Y-2.0369 I0 J.3243
N00444 G01 Y-1.9369
N00445 G00 Z-.6524
N00446 Y-1.7557
N00447 G01 Z-.8007 F6.4
N00448 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00449 X-2.9532 Y-1.6227 I0 J.0665
N00450 X-2.9532 Y-1.8494 I0 J-.1134
N00451 X-2.9532 Y-1.529 I0 J.1602
N00452 X-2.9532 Y-1.9432 I0 J-.2071
N00453 X-2.9532 Y-1.4352 I0 J.254
N00454 X-2.9532 Y-2.0369 I0 J-.3009
N00455 X-2.9532 Y-2.0369 I0 J.3243
N00456 G01 Y-1.9369
N00457 G00 Z-.7007
N00458 Y-1.7557
N00459 G01 Z-.8489 F6.4
N00460 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00461 X-2.9532 Y-1.6227 I0 J.0665
N00462 X-2.9532 Y-1.8494 I0 J-.1134
N00463 X-2.9532 Y-1.529 I0 J.1602
N00464 X-2.9532 Y-1.9432 I0 J-.2071
N00465 X-2.9532 Y-1.4352 I0 J.254
N00466 X-2.9532 Y-2.0369 I0 J-.3009
N00467 X-2.9532 Y-2.0369 I0 J.3243
N00468 G01 Y-1.9369
N00469 G00 Z-.7489
N00470 Y-1.7557
N00471 G01 Z-.8972 F6.4
N00472 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00473 X-2.9532 Y-1.6227 I0 J.0665
N00474 X-2.9532 Y-1.8494 I0 J-.1134
N00475 X-2.9532 Y-1.529 I0 J.1602
N00476 X-2.9532 Y-1.9432 I0 J-.2071
N00477 X-2.9532 Y-1.4352 I0 J.254
N00478 X-2.9532 Y-2.0369 I0 J-.3009
N00479 X-2.9532 Y-2.0369 I0 J.3243
N00480 G01 Y-1.9369
N00481 G00 Z-.7972
N00482 Y-1.7557
N00483 G01 Z-.9455 F6.4
N00484 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00485 X-2.9532 Y-1.6227 I0 J.0665
N00486 X-2.9532 Y-1.8494 I0 J-.1134
N00487 X-2.9532 Y-1.529 I0 J.1602
N00488 X-2.9532 Y-1.9432 I0 J-.2071
N00489 X-2.9532 Y-1.4352 I0 J.254
N00490 X-2.9532 Y-2.0369 I0 J-.3009
N00491 X-2.9532 Y-2.0369 I0 J.3243

N00492 G01 Y-1.9369
N00493 G00 Z-.8455
N00494 Y-1.7557
N00495 G01 Z-.9937 F6.4
N00496 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00497 X-2.9532 Y-1.6227 I0 J.0665
N00498 X-2.9532 Y-1.8494 I0 J-.1134
N00499 X-2.9532 Y-1.529 I0 J.1602
N00500 X-2.9532 Y-1.9432 I0 J-.2071
N00501 X-2.9532 Y-1.4352 I0 J.254
N00502 X-2.9532 Y-2.0369 I0 J-.3009
N00503 X-2.9532 Y-2.0369 I0 J.3243
N00504 G01 Y-1.9369
N00505 G00 Z-.8937
N00506 Y-1.7557
N00507 G01 Z-1.1358 F6.4
N00508 G03 X-2.9532 Y-1.7557 I0 J.0431 F28.
N00509 X-2.9532 Y-1.6227 I0 J.0665
N00510 X-2.9532 Y-1.8494 I0 J-.1134
N00511 X-2.9532 Y-1.529 I0 J.1602
N00512 X-2.9532 Y-1.9432 I0 J-.2071
N00513 X-2.9532 Y-1.4352 I0 J.254
N00514 X-2.9532 Y-2.0369 I0 J-.3009
N00515 X-2.9532 Y-2.0369 I0 J.3243
N00516 G01 Y-1.9369
N00517 G00 Z.1
(START OF OPERATION: SolidMill - Pocketing)
N00518 G00 G54 (Assuming G54)
N00519 X2.9523 Y-1.7557
N00520 Z.1
N00521 Z-.025
N00522 G01 Z-.1733 F6.4
N00523 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00524 X2.9523 Y-1.6227 I0 J.0665
N00525 X2.9523 Y-1.8494 I0 J-.1134
N00526 X2.9523 Y-1.529 I0 J.1602
N00527 X2.9523 Y-1.9432 I0 J-.2071
N00528 X2.9523 Y-1.4352 I0 J.254
N00529 X2.9523 Y-2.0369 I0 J-.3009
N00530 X2.9523 Y-2.0369 I0 J.3243
N00531 G01 Y-1.9369
N00532 G00 Z-.0733
N00533 Y-1.7557
N00534 G01 Z-.2215 F6.4
N00535 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00536 X2.9523 Y-1.6227 I0 J.0665
N00537 X2.9523 Y-1.8494 I0 J-.1134
N00538 X2.9523 Y-1.529 I0 J.1602
N00539 X2.9523 Y-1.9432 I0 J-.2071
N00540 X2.9523 Y-1.4352 I0 J.254
N00541 X2.9523 Y-2.0369 I0 J-.3009
N00542 X2.9523 Y-2.0369 I0 J.3243
N00543 G01 Y-1.9369
N00544 G00 Z-.1215
N00545 Y-1.7557
N00546 G01 Z-.2698 F6.4
N00547 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
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N00549 X2.9523 Y-1.8494 I0 J-.1134
N00550 X2.9523 Y-1.529 I0 J.1602
N00551 X2.9523 Y-1.9432 I0 J-.2071
N00552 X2.9523 Y-1.4352 I0 J.254
N00553 X2.9523 Y-2.0369 I0 J-.3009
N00554 X2.9523 Y-2.0369 I0 J.3243
N00555 G01 Y-1.9369
N00556 G00 Z-.1698
N00557 Y-1.7557
N00558 G01 Z-.3181 F6.4
N00559 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00560 X2.9523 Y-1.6227 I0 J.0665
N00561 X2.9523 Y-1.8494 I0 J-.1134
N00562 X2.9523 Y-1.529 I0 J.1602
N00563 X2.9523 Y-1.9432 I0 J-.2071
N00564 X2.9523 Y-1.4352 I0 J.254
N00565 X2.9523 Y-2.0369 I0 J-.3009
N00566 X2.9523 Y-2.0369 I0 J.3243
N00567 G01 Y-1.9369
N00568 G00 Z-.2181
N00569 Y-1.7557
N00570 G01 Z-.3663 F6.4

N00571 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00572 X2.9523 Y-1.6227 I0 J.0665
N00573 X2.9523 Y-1.8494 I0 J-.1134
N00574 X2.9523 Y-1.529 I0 J.1602
N00575 X2.9523 Y-1.9432 I0 J-.2071
N00576 X2.9523 Y-1.4352 I0 J.254
N00577 X2.9523 Y-2.0369 I0 J-.3009
N00578 X2.9523 Y-2.0369 I0 J.3243
N00579 G01 Y-1.9369
N00580 G00 Z-.2663
N00581 Y-1.7557
N00582 G01 Z-.4146 F6.4
N00583 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00584 X2.9523 Y-1.6227 I0 J.0665
N00585 X2.9523 Y-1.8494 I0 J-.1134
N00586 X2.9523 Y-1.529 I0 J.1602
N00587 X2.9523 Y-1.9432 I0 J-.2071
N00588 X2.9523 Y-1.4352 I0 J.254
N00589 X2.9523 Y-2.0369 I0 J-.3009
N00590 X2.9523 Y-2.0369 I0 J.3243
N00591 G01 Y-1.9369
N00592 G00 Z-.3146
N00593 Y-1.7557
N00594 G01 Z-.4628 F6.4
N00595 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00596 X2.9523 Y-1.6227 I0 J.0665
N00597 X2.9523 Y-1.8494 I0 J-.1134
N00598 X2.9523 Y-1.529 I0 J.1602
N00599 X2.9523 Y-1.9432 I0 J-.2071
N00600 X2.9523 Y-1.4352 I0 J.254
N00601 X2.9523 Y-2.0369 I0 J-.3009
N00602 X2.9523 Y-2.0369 I0 J.3243
N00603 G01 Y-1.9369
N00604 G00 Z-.3628
N00605 Y-1.7557
N00606 G01 Z-.5111 F6.4
N00607 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00608 X2.9523 Y-1.6227 I0 J.0665
N00609 X2.9523 Y-1.8494 I0 J-.1134
N00610 X2.9523 Y-1.529 I0 J.1602
N00611 X2.9523 Y-1.9432 I0 J-.2071
N00612 X2.9523 Y-1.4352 I0 J.254
N00613 X2.9523 Y-2.0369 I0 J-.3009
N00614 X2.9523 Y-2.0369 I0 J.3243
N00615 G01 Y-1.9369
N00616 G00 Z-.4111
N00617 Y-1.7557
N00618 G01 Z-.5594 F6.4
N00619 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
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N00621 X2.9523 Y-1.8494 I0 J-.1134
N00622 X2.9523 Y-1.529 I0 J.1602
N00623 X2.9523 Y-1.9432 I0 J-.2071
N00624 X2.9523 Y-1.4352 I0 J.254
N00625 X2.9523 Y-2.0369 I0 J-.3009
N00626 X2.9523 Y-2.0369 I0 J.3243
N00627 G01 Y-1.9369
N00628 G00 Z-.4594
N00629 Y-1.7557
N00630 G01 Z-.6076 F6.4
N00631 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00632 X2.9523 Y-1.6227 I0 J.0665
N00633 X2.9523 Y-1.8494 I0 J-.1134
N00634 X2.9523 Y-1.529 I0 J.1602
N00635 X2.9523 Y-1.9432 I0 J-.2071
N00636 X2.9523 Y-1.4352 I0 J.254
N00637 X2.9523 Y-2.0369 I0 J-.3009
N00638 X2.9523 Y-2.0369 I0 J.3243
N00639 G01 Y-1.9369
N00640 G00 Z-.5076
N00641 Y-1.7557
N00642 G01 Z-.6559 F6.4
N00643 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
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N00645 X2.9523 Y-1.8494 I0 J-.1134
N00646 X2.9523 Y-1.529 I0 J.1602
N00647 X2.9523 Y-1.9432 I0 J-.2071
N00648 X2.9523 Y-1.4352 I0 J.254
N00649 X2.9523 Y-2.0369 I0 J-.3009
N00650 X2.9523 Y-2.0369 I0 J.3243
N00651 G01 Y-1.9369

N00652 G00 Z-.5559
N00653 Y-1.7557
N00654 G01 Z-.7042 F6.4
N00655 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00656 X2.9523 Y-1.6227 I0 J.0665
N00657 X2.9523 Y-1.8494 I0 J-.1134
N00658 X2.9523 Y-1.529 I0 J.1602
N00659 X2.9523 Y-1.9432 I0 J-.2071
N00660 X2.9523 Y-1.4352 I0 J.254
N00661 X2.9523 Y-2.0369 I0 J-.3009
N00662 X2.9523 Y-2.0369 I0 J.3243
N00663 G01 Y-1.9369
N00664 G00 Z-.6042
N00665 Y-1.7557
N00666 G01 Z-.7524 F6.4
N00667 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00668 X2.9523 Y-1.6227 I0 J.0665
N00669 X2.9523 Y-1.8494 I0 J-.1134
N00670 X2.9523 Y-1.529 I0 J.1602
N00671 X2.9523 Y-1.9432 I0 J-.2071
N00672 X2.9523 Y-1.4352 I0 J.254
N00673 X2.9523 Y-2.0369 I0 J-.3009
N00674 X2.9523 Y-2.0369 I0 J.3243
N00675 G01 Y-1.9369
N00676 G00 Z-.6524
N00677 Y-1.7557
N00678 G01 Z-.8007 F6.4
N00679 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00680 X2.9523 Y-1.6227 I0 J.0665
N00681 X2.9523 Y-1.8494 I0 J-.1134
N00682 X2.9523 Y-1.529 I0 J.1602
N00683 X2.9523 Y-1.9432 I0 J-.2071
N00684 X2.9523 Y-1.4352 I0 J.254
N00685 X2.9523 Y-2.0369 I0 J-.3009
N00686 X2.9523 Y-2.0369 I0 J.3243
N00687 G01 Y-1.9369
N00688 G00 Z-.7007
N00689 Y-1.7557
N00690 G01 Z-.8489 F6.4
N00691 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00692 X2.9523 Y-1.6227 I0 J.0665
N00693 X2.9523 Y-1.8494 I0 J-.1134
N00694 X2.9523 Y-1.529 I0 J.1602
N00695 X2.9523 Y-1.9432 I0 J-.2071
N00696 X2.9523 Y-1.4352 I0 J.254
N00697 X2.9523 Y-2.0369 I0 J-.3009
N00698 X2.9523 Y-2.0369 I0 J.3243
N00699 G01 Y-1.9369
N00700 G00 Z-.7489
N00701 Y-1.7557
N00702 G01 Z-.8972 F6.4
N00703 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00704 X2.9523 Y-1.6227 I0 J.0665
N00705 X2.9523 Y-1.8494 I0 J-.1134
N00706 X2.9523 Y-1.529 I0 J.1602
N00707 X2.9523 Y-1.9432 I0 J-.2071
N00708 X2.9523 Y-1.4352 I0 J.254
N00709 X2.9523 Y-2.0369 I0 J-.3009
N00710 X2.9523 Y-2.0369 I0 J.3243
N00711 G01 Y-1.9369
N00712 G00 Z-.7972
N00713 Y-1.7557
N00714 G01 Z-.9455 F6.4
N00715 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00716 X2.9523 Y-1.6227 I0 J.0665
N00717 X2.9523 Y-1.8494 I0 J-.1134
N00718 X2.9523 Y-1.529 I0 J.1602
N00719 X2.9523 Y-1.9432 I0 J-.2071
N00720 X2.9523 Y-1.4352 I0 J.254
N00721 X2.9523 Y-2.0369 I0 J-.3009
N00722 X2.9523 Y-2.0369 I0 J.3243
N00723 G01 Y-1.9369
N00724 G00 Z-.8455
N00725 Y-1.7557
N00726 G01 Z-.9937 F6.4
N00727 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00728 X2.9523 Y-1.6227 I0 J.0665
N00729 X2.9523 Y-1.8494 I0 J-.1134
N00730 X2.9523 Y-1.529 I0 J.1602
N00731 X2.9523 Y-1.9432 I0 J-.2071
N00732 X2.9523 Y-1.4352 I0 J.254

N00733 X2.9523 Y-2.0369 I0 J-.3009
N00734 X2.9523 Y-2.0369 I0 J.3243
N00735 G01 Y-1.9369
N00736 G00 Z-.8937
N00737 Y-1.7557
N00738 G01 Z-1.1358 F6.4
N00739 G03 X2.9523 Y-1.7557 I0 J.0431 F28.
N00740 X2.9523 Y-1.6227 I0 J.0665
N00741 X2.9523 Y-1.8494 I0 J-.1134
N00742 X2.9523 Y-1.529 I0 J.1602
N00743 X2.9523 Y-1.9432 I0 J-.2071
N00744 X2.9523 Y-1.4352 I0 J.254
N00745 X2.9523 Y-2.0369 I0 J-.3009
N00746 X2.9523 Y-2.0369 I0 J.3243
N00747 G01 Y-1.9369
N00748 G00 Z.1
(START OF OPERATION: SolidMill - Pocketing)
N00749 G00 G54 (Assuming G54)
N00750 X2.9523 Y1.1971
N00751 Z.1
N00752 Z-.025
N00753 G01 Z-.1733 F6.4
N00754 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00755 X2.9523 Y1.3301 I0 J.0665
N00756 X2.9523 Y1.1033 I0 J-.1134
N00757 X2.9523 Y1.4238 I0 J.1603
N00758 X2.9523 Y1.0096 I0 J-.2071
N00759 X2.9523 Y1.5176 I0 J.254
N00760 X2.9523 Y.9158 I0 J-.3009
N00761 X2.9523 Y.9158 I0 J.3243
N00762 G01 Y1.0158
N00763 G00 Z-.0733
N00764 Y1.1971
N00765 G01 Z-.2215 F6.4
N00766 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00767 X2.9523 Y1.3301 I0 J.0665
N00768 X2.9523 Y1.1033 I0 J-.1134
N00769 X2.9523 Y1.4238 I0 J.1603
N00770 X2.9523 Y1.0096 I0 J-.2071
N00771 X2.9523 Y1.5176 I0 J.254
N00772 X2.9523 Y.9158 I0 J-.3009
N00773 X2.9523 Y.9158 I0 J.3243
N00774 G01 Y1.0158
N00775 G00 Z-.1215
N00776 Y1.1971
N00777 G01 Z-.2698 F6.4
N00778 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00779 X2.9523 Y1.3301 I0 J.0665
N00780 X2.9523 Y1.1033 I0 J-.1134
N00781 X2.9523 Y1.4238 I0 J.1603
N00782 X2.9523 Y1.0096 I0 J-.2071
N00783 X2.9523 Y1.5176 I0 J.254
N00784 X2.9523 Y.9158 I0 J-.3009
N00785 X2.9523 Y.9158 I0 J.3243
N00786 G01 Y1.0158
N00787 G00 Z-.1698
N00788 Y1.1971
N00789 G01 Z-.3181 F6.4
N00790 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00791 X2.9523 Y1.3301 I0 J.0665
N00792 X2.9523 Y1.1033 I0 J-.1134
N00793 X2.9523 Y1.4238 I0 J.1603
N00794 X2.9523 Y1.0096 I0 J-.2071
N00795 X2.9523 Y1.5176 I0 J.254
N00796 X2.9523 Y.9158 I0 J-.3009
N00797 X2.9523 Y.9158 I0 J.3243
N00798 G01 Y1.0158
N00799 G00 Z-.2181
N00800 Y1.1971
N00801 G01 Z-.3663 F6.4
N00802 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00803 X2.9523 Y1.3301 I0 J.0665
N00804 X2.9523 Y1.1033 I0 J-.1134
N00805 X2.9523 Y1.4238 I0 J.1603
N00806 X2.9523 Y1.0096 I0 J-.2071
N00807 X2.9523 Y1.5176 I0 J.254
N00808 X2.9523 Y.9158 I0 J-.3009
N00809 X2.9523 Y.9158 I0 J.3243
N00810 G01 Y1.0158
N00811 G00 Z-.2663
N00812 Y1.1971
N00813 G01 Z-.4146 F6.4
N00814 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00815 X2.9523 Y1.3301 I0 J.0665
N00816 X2.9523 Y1.1033 I0 J-.1134
N00817 X2.9523 Y1.4238 I0 J.1603

N00818 X2.9523 Y1.0096 I0 J-.2071
N00819 X2.9523 Y1.5176 I0 J.254
N00820 X2.9523 Y.9158 I0 J-.3009
N00821 X2.9523 Y.9158 I0 J.3243
N00822 G01 Y1.0158
N00823 G00 Z-.3146
N00824 Y1.1971
N00825 G01 Z-.4628 F6.4
N00826 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00827 X2.9523 Y1.3301 I0 J.0665
N00828 X2.9523 Y1.1033 I0 J-.1134
N00829 X2.9523 Y1.4238 I0 J.1603
N00830 X2.9523 Y1.0096 I0 J-.2071
N00831 X2.9523 Y1.5176 I0 J.254
N00832 X2.9523 Y.9158 I0 J-.3009
N00833 X2.9523 Y.9158 I0 J.3243
N00834 G01 Y1.0158
N00835 G00 Z-.3628
N00836 Y1.1971
N00837 G01 Z-.5111 F6.4
N00838 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00839 X2.9523 Y1.3301 I0 J.0665
N00840 X2.9523 Y1.1033 I0 J-.1134
N00841 X2.9523 Y1.4238 I0 J.1603
N00842 X2.9523 Y1.0096 I0 J-.2071
N00843 X2.9523 Y1.5176 I0 J.254
N00844 X2.9523 Y.9158 I0 J-.3009
N00845 X2.9523 Y.9158 I0 J.3243
N00846 G01 Y1.0158
N00847 G00 Z-.4111
N00848 Y1.1971
N00849 G01 Z-.5594 F6.4
N00850 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00851 X2.9523 Y1.3301 I0 J.0665
N00852 X2.9523 Y1.1033 I0 J-.1134
N00853 X2.9523 Y1.4238 I0 J.1603
N00854 X2.9523 Y1.0096 I0 J-.2071
N00855 X2.9523 Y1.5176 I0 J.254
N00856 X2.9523 Y.9158 I0 J-.3009
N00857 X2.9523 Y.9158 I0 J.3243
N00858 G01 Y1.0158
N00859 G00 Z-.4594
N00860 Y1.1971
N00861 G01 Z-.6076 F6.4
N00862 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00863 X2.9523 Y1.3301 I0 J.0665
N00864 X2.9523 Y1.1033 I0 J-.1134
N00865 X2.9523 Y1.4238 I0 J.1603
N00866 X2.9523 Y1.0096 I0 J-.2071
N00867 X2.9523 Y1.5176 I0 J.254
N00868 X2.9523 Y.9158 I0 J-.3009
N00869 X2.9523 Y.9158 I0 J.3243
N00870 G01 Y1.0158
N00871 G00 Z-.5076
N00872 Y1.1971
N00873 G01 Z-.6559 F6.4
N00874 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00875 X2.9523 Y1.3301 I0 J.0665
N00876 X2.9523 Y1.1033 I0 J-.1134
N00877 X2.9523 Y1.4238 I0 J.1603
N00878 X2.9523 Y1.0096 I0 J-.2071
N00879 X2.9523 Y1.5176 I0 J.254
N00880 X2.9523 Y.9158 I0 J-.3009
N00881 X2.9523 Y.9158 I0 J.3243
N00882 G01 Y1.0158
N00883 G00 Z-.5559
N00884 Y1.1971
N00885 G01 Z-.7042 F6.4
N00886 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00887 X2.9523 Y1.3301 I0 J.0665
N00888 X2.9523 Y1.1033 I0 J-.1134
N00889 X2.9523 Y1.4238 I0 J.1603
N00890 X2.9523 Y1.0096 I0 J-.2071
N00891 X2.9523 Y1.5176 I0 J.254
N00892 X2.9523 Y.9158 I0 J-.3009
N00893 X2.9523 Y.9158 I0 J.3243
N00894 G01 Y1.0158
N00895 G00 Z-.6042
N00896 Y1.1971
N00897 G01 Z-.7524 F6.4
N00898 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00899 X2.9523 Y1.3301 I0 J.0665
N00900 X2.9523 Y1.1033 I0 J-.1134
N00901 X2.9523 Y1.4238 I0 J.1603
N00902 X2.9523 Y1.0096 I0 J-.2071
N00903 X2.9523 Y1.5176 I0 J.254
N00904 X2.9523 Y.9158 I0 J-.3009
N00905 X2.9523 Y.9158 I0 J.3243

N00906 G01 Y1.0158
N00907 G00 Z-.6524
N00908 Y1.1971
N00909 G01 Z-.8007 F6.4
N00910 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00911 X2.9523 Y1.3301 I0 J.0665
N00912 X2.9523 Y1.1033 I0 J-.1134
N00913 X2.9523 Y1.4238 I0 J.1603
N00914 X2.9523 Y1.0096 I0 J-.2071
N00915 X2.9523 Y1.5176 I0 J.254
N00916 X2.9523 Y.9158 I0 J-.3009
N00917 X2.9523 Y.9158 I0 J.3243
N00918 G01 Y1.0158
N00919 G00 Z-.7007
N00920 Y1.1971
N00921 G01 Z-.8489 F6.4
N00922 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00923 X2.9523 Y1.3301 I0 J.0665
N00924 X2.9523 Y1.1033 I0 J-.1134
N00925 X2.9523 Y1.4238 I0 J.1603
N00926 X2.9523 Y1.0096 I0 J-.2071
N00927 X2.9523 Y1.5176 I0 J.254
N00928 X2.9523 Y.9158 I0 J-.3009
N00929 X2.9523 Y.9158 I0 J.3243
N00930 G01 Y1.0158
N00931 G00 Z-.7489
N00932 Y1.1971
N00933 G01 Z-.8972 F6.4
N00934 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00935 X2.9523 Y1.3301 I0 J.0665
N00936 X2.9523 Y1.1033 I0 J-.1134
N00937 X2.9523 Y1.4238 I0 J.1603
N00938 X2.9523 Y1.0096 I0 J-.2071
N00939 X2.9523 Y1.5176 I0 J.254
N00940 X2.9523 Y.9158 I0 J-.3009
N00941 X2.9523 Y.9158 I0 J.3243
N00942 G01 Y1.0158
N00943 G00 Z-.7972
N00944 Y1.1971
N00945 G01 Z-.9455 F6.4
N00946 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00947 X2.9523 Y1.3301 I0 J.0665
N00948 X2.9523 Y1.1033 I0 J-.1134
N00949 X2.9523 Y1.4238 I0 J.1603
N00950 X2.9523 Y1.0096 I0 J-.2071
N00951 X2.9523 Y1.5176 I0 J.254
N00952 X2.9523 Y.9158 I0 J-.3009
N00953 X2.9523 Y.9158 I0 J.3243
N00954 G01 Y1.0158
N00955 G00 Z-.8455
N00956 Y1.1971
N00957 G01 Z-.9937 F6.4
N00958 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00959 X2.9523 Y1.3301 I0 J.0665
N00960 X2.9523 Y1.1033 I0 J-.1134
N00961 X2.9523 Y1.4238 I0 J.1603
N00962 X2.9523 Y1.0096 I0 J-.2071
N00963 X2.9523 Y1.5176 I0 J.254
N00964 X2.9523 Y.9158 I0 J-.3009
N00965 X2.9523 Y.9158 I0 J.3243
N00966 G01 Y1.0158
N00967 G00 Z-.8937
N00968 Y1.1971
N00969 G01 Z-1.1358 F6.4
N00970 G03 X2.9523 Y1.1971 I0 J.043 F28.
N00971 X2.9523 Y1.3301 I0 J.0665
N00972 X2.9523 Y1.1033 I0 J-.1134
N00973 X2.9523 Y1.4238 I0 J.1603
N00974 X2.9523 Y1.0096 I0 J-.2071
N00975 X2.9523 Y1.5176 I0 J.254
N00976 X2.9523 Y.9158 I0 J-.3009
N00977 X2.9523 Y.9158 I0 J.3243
N00978 G01 Y1.0158
N00979 G00 Z.1
(START OF OPERATION: SolidMill - Pocketing)
N00980 G00 G54 (Assuming G54)
N00981 X-.0004 Y-1.5087
N00982 Z.1
N00983 Z-.025
N00984 G01 Z-.1731 F6.4
N00985 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N00986 X-.0004 Y-1.3383 I0 J.0852
N00987 X-.0004 Y-1.6024 I0 J-.132
N00988 X-.0004 Y-1.2445 I0 J.1789
N00989 X-.0004 Y-1.6962 I0 J-.2258
N00990 X-.0004 Y-1.1508 I0 J.2727
N00991 X-.0004 Y-1.7899 I0 J-.3195

N00992 X-.0004 Y-1.057 I0 J.3664
N00993 X-.0004 Y-1.8837 I0 J-.4133
N00994 X-.0004 Y-.9633 I0 J.4602
N00995 X-.0004 Y-1.9774 I0 J-.507
N00996 X-.0004 Y-.8695 I0 J.5539
N00997 X-.0004 Y-2.0712 I0 J-.6008
N00998 X-.0004 Y-.7758 I0 J.6477
N00999 X-.0004 Y-2.1649 I0 J-.6945
N01000 X-.0004 Y-2.1649 I0 J.718
N01001 G01 Y-2.0649
N01002 G00 Z-.0731
N01003 Y-1.5087
N01004 G01 Z-.2212 F6.4
N01005 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01006 X-.0004 Y-1.3383 I0 J.0852
N01007 X-.0004 Y-1.6024 I0 J-.132
N01008 X-.0004 Y-1.2445 I0 J.1789
N01009 X-.0004 Y-1.6962 I0 J-.2258
N01010 X-.0004 Y-1.1508 I0 J.2727
N01011 X-.0004 Y-1.7899 I0 J-.3195
N01012 X-.0004 Y-1.057 I0 J.3664
N01013 X-.0004 Y-1.8837 I0 J-.4133
N01014 X-.0004 Y-.9633 I0 J.4602
N01015 X-.0004 Y-1.9774 I0 J-.507
N01016 X-.0004 Y-.8695 I0 J.5539
N01017 X-.0004 Y-2.0712 I0 J-.6008
N01018 X-.0004 Y-.7758 I0 J.6477
N01019 X-.0004 Y-2.1649 I0 J-.6945
N01020 X-.0004 Y-2.1649 I0 J.718
N01021 G01 Y-2.0649
N01022 G00 Z-.1212
N01023 Y-1.5087
N01024 G01 Z-.2692 F6.4
N01025 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01026 X-.0004 Y-1.3383 I0 J.0852
N01027 X-.0004 Y-1.6024 I0 J-.132
N01028 X-.0004 Y-1.2445 I0 J.1789
N01029 X-.0004 Y-1.6962 I0 J-.2258
N01030 X-.0004 Y-1.1508 I0 J.2727
N01031 X-.0004 Y-1.7899 I0 J-.3195
N01032 X-.0004 Y-1.057 I0 J.3664
N01033 X-.0004 Y-1.8837 I0 J-.4133
N01034 X-.0004 Y-.9633 I0 J.4602
N01035 X-.0004 Y-1.9774 I0 J-.507
N01036 X-.0004 Y-.8695 I0 J.5539
N01037 X-.0004 Y-2.0712 I0 J-.6008
N01038 X-.0004 Y-.7758 I0 J.6477
N01039 X-.0004 Y-2.1649 I0 J-.6945
N01040 X-.0004 Y-2.1649 I0 J.718
N01041 G01 Y-2.0649
N01042 G00 Z-.1692
N01043 Y-1.5087
N01044 G01 Z-.3173 F6.4
N01045 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01046 X-.0004 Y-1.3383 I0 J.0852
N01047 X-.0004 Y-1.6024 I0 J-.132
N01048 X-.0004 Y-1.2445 I0 J.1789
N01049 X-.0004 Y-1.6962 I0 J-.2258
N01050 X-.0004 Y-1.1508 I0 J.2727
N01051 X-.0004 Y-1.7899 I0 J-.3195
N01052 X-.0004 Y-1.057 I0 J.3664
N01053 X-.0004 Y-1.8837 I0 J-.4133
N01054 X-.0004 Y-.9633 I0 J.4602
N01055 X-.0004 Y-1.9774 I0 J-.507
N01056 X-.0004 Y-.8695 I0 J.5539
N01057 X-.0004 Y-2.0712 I0 J-.6008
N01058 X-.0004 Y-.7758 I0 J.6477
N01059 X-.0004 Y-2.1649 I0 J-.6945
N01060 X-.0004 Y-2.1649 I0 J.718
N01061 G01 Y-2.0649
N01062 G00 Z-.2173
N01063 Y-1.5087
N01064 G01 Z-.3654 F6.4
N01065 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01066 X-.0004 Y-1.3383 I0 J.0852
N01067 X-.0004 Y-1.6024 I0 J-.132
N01068 X-.0004 Y-1.2445 I0 J.1789
N01069 X-.0004 Y-1.6962 I0 J-.2258
N01070 X-.0004 Y-1.1508 I0 J.2727
N01071 X-.0004 Y-1.7899 I0 J-.3195
N01072 X-.0004 Y-1.057 I0 J.3664
N01073 X-.0004 Y-1.8837 I0 J-.4133
N01074 X-.0004 Y-.9633 I0 J.4602
N01075 X-.0004 Y-1.9774 I0 J-.507
N01076 X-.0004 Y-.8695 I0 J.5539
N01077 X-.0004 Y-2.0712 I0 J-.6008
N01078 X-.0004 Y-.7758 I0 J.6477
N01079 X-.0004 Y-2.1649 I0 J-.6945

N01080 X-.0004 Y-2.1649 I0 J.718
N01081 G01 Y-2.0649
N01082 G00 Z-.2654
N01083 Y-1.5087
N01084 G01 Z-.4135 F6.4
N01085 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01086 X-.0004 Y-1.3383 I0 J.0852
N01087 X-.0004 Y-1.6024 I0 J-.132
N01088 X-.0004 Y-1.2445 I0 J.1789
N01089 X-.0004 Y-1.6962 I0 J-.2258
N01090 X-.0004 Y-1.1508 I0 J.2727
N01091 X-.0004 Y-1.7899 I0 J-.3195
N01092 X-.0004 Y-1.057 I0 J.3664
N01093 X-.0004 Y-1.8837 I0 J-.4133
N01094 X-.0004 Y-.9633 I0 J.4602
N01095 X-.0004 Y-1.9774 I0 J-.507
N01096 X-.0004 Y-.8695 I0 J.5539
N01097 X-.0004 Y-2.0712 I0 J-.6008
N01098 X-.0004 Y-.7758 I0 J.6477
N01099 X-.0004 Y-2.1649 I0 J-.6945
N01100 X-.0004 Y-2.1649 I0 J.718
N01101 G01 Y-2.0649
N01102 G00 Z-.3135
N01103 Y-1.5087
N01104 G01 Z-.4615 F6.4
N01105 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01106 X-.0004 Y-1.3383 I0 J.0852
N01107 X-.0004 Y-1.6024 I0 J-.132
N01108 X-.0004 Y-1.2445 I0 J.1789
N01109 X-.0004 Y-1.6962 I0 J-.2258
N01110 X-.0004 Y-1.1508 I0 J.2727
N01111 X-.0004 Y-1.7899 I0 J-.3195
N01112 X-.0004 Y-1.057 I0 J.3664
N01113 X-.0004 Y-1.8837 I0 J-.4133
N01114 X-.0004 Y-.9633 I0 J.4602
N01115 X-.0004 Y-1.9774 I0 J-.507
N01116 X-.0004 Y-.8695 I0 J.5539
N01117 X-.0004 Y-2.0712 I0 J-.6008
N01118 X-.0004 Y-.7758 I0 J.6477
N01119 X-.0004 Y-2.1649 I0 J-.6945
N01120 X-.0004 Y-2.1649 I0 J.718
N01121 G01 Y-2.0649
N01122 G00 Z-.3615
N01123 Y-1.5087
N01124 G01 Z-.5096 F6.4
N01125 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01126 X-.0004 Y-1.3383 I0 J.0852
N01127 X-.0004 Y-1.6024 I0 J-.132
N01128 X-.0004 Y-1.2445 I0 J.1789
N01129 X-.0004 Y-1.6962 I0 J-.2258
N01130 X-.0004 Y-1.1508 I0 J.2727
N01131 X-.0004 Y-1.7899 I0 J-.3195
N01132 X-.0004 Y-1.057 I0 J.3664
N01133 X-.0004 Y-1.8837 I0 J-.4133
N01134 X-.0004 Y-.9633 I0 J.4602
N01135 X-.0004 Y-1.9774 I0 J-.507
N01136 X-.0004 Y-.8695 I0 J.5539
N01137 X-.0004 Y-2.0712 I0 J-.6008
N01138 X-.0004 Y-.7758 I0 J.6477
N01139 X-.0004 Y-2.1649 I0 J-.6945
N01140 X-.0004 Y-2.1649 I0 J.718
N01141 G01 Y-2.0649
N01142 G00 Z-.4096
N01143 Y-1.5087
N01144 G01 Z-.5577 F6.4
N01145 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01146 X-.0004 Y-1.3383 I0 J.0852
N01147 X-.0004 Y-1.6024 I0 J-.132
N01148 X-.0004 Y-1.2445 I0 J.1789
N01149 X-.0004 Y-1.6962 I0 J-.2258
N01150 X-.0004 Y-1.1508 I0 J.2727
N01151 X-.0004 Y-1.7899 I0 J-.3195
N01152 X-.0004 Y-1.057 I0 J.3664
N01153 X-.0004 Y-1.8837 I0 J-.4133
N01154 X-.0004 Y-.9633 I0 J.4602
N01155 X-.0004 Y-1.9774 I0 J-.507
N01156 X-.0004 Y-.8695 I0 J.5539
N01157 X-.0004 Y-2.0712 I0 J-.6008
N01158 X-.0004 Y-.7758 I0 J.6477
N01159 X-.0004 Y-2.1649 I0 J-.6945
N01160 X-.0004 Y-2.1649 I0 J.718
N01161 G01 Y-2.0649
N01162 G00 Z-.4577
N01163 Y-1.5087
N01164 G01 Z-.6058 F6.4
N01165 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01166 X-.0004 Y-1.3383 I0 J.0852
N01167 X-.0004 Y-1.6024 I0 J-.132

N01168 X-.0004 Y-1.2445 I0 J.1789
N01169 X-.0004 Y-1.6962 I0 J-.2258
N01170 X-.0004 Y-1.1508 I0 J.2727
N01171 X-.0004 Y-1.7899 I0 J-.3195
N01172 X-.0004 Y-1.057 I0 J.3664
N01173 X-.0004 Y-1.8837 I0 J-.4133
N01174 X-.0004 Y-.9633 I0 J.4602
N01175 X-.0004 Y-1.9774 I0 J-.507
N01176 X-.0004 Y-.8695 I0 J.5539
N01177 X-.0004 Y-2.0712 I0 J-.6008
N01178 X-.0004 Y-.7758 I0 J.6477
N01179 X-.0004 Y-2.1649 I0 J-.6945
N01180 X-.0004 Y-2.1649 I0 J.718
N01181 G01 Y-2.0649
N01182 G00 Z-.5058
N01183 Y-1.5087
N01184 G01 Z-.6538 F6.4
N01185 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01186 X-.0004 Y-1.3383 I0 J.0852
N01187 X-.0004 Y-1.6024 I0 J-.132
N01188 X-.0004 Y-1.2445 I0 J.1789
N01189 X-.0004 Y-1.6962 I0 J-.2258
N01190 X-.0004 Y-1.1508 I0 J.2727
N01191 X-.0004 Y-1.7899 I0 J-.3195
N01192 X-.0004 Y-1.057 I0 J.3664
N01193 X-.0004 Y-1.8837 I0 J-.4133
N01194 X-.0004 Y-.9633 I0 J.4602
N01195 X-.0004 Y-1.9774 I0 J-.507
N01196 X-.0004 Y-.8695 I0 J.5539
N01197 X-.0004 Y-2.0712 I0 J-.6008
N01198 X-.0004 Y-.7758 I0 J.6477
N01199 X-.0004 Y-2.1649 I0 J-.6945
N01200 X-.0004 Y-2.1649 I0 J.718
N01201 G01 Y-2.0649
N01202 G00 Z-.5538
N01203 Y-1.5087
N01204 G01 Z-.7019 F6.4
N01205 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01206 X-.0004 Y-1.3383 I0 J.0852
N01207 X-.0004 Y-1.6024 I0 J-.132
N01208 X-.0004 Y-1.2445 I0 J.1789
N01209 X-.0004 Y-1.6962 I0 J-.2258
N01210 X-.0004 Y-1.1508 I0 J.2727
N01211 X-.0004 Y-1.7899 I0 J-.3195
N01212 X-.0004 Y-1.057 I0 J.3664
N01213 X-.0004 Y-1.8837 I0 J-.4133
N01214 X-.0004 Y-.9633 I0 J.4602
N01215 X-.0004 Y-1.9774 I0 J-.507
N01216 X-.0004 Y-.8695 I0 J.5539
N01217 X-.0004 Y-2.0712 I0 J-.6008
N01218 X-.0004 Y-.7758 I0 J.6477
N01219 X-.0004 Y-2.1649 I0 J-.6945
N01220 X-.0004 Y-2.1649 I0 J.718
N01221 G01 Y-2.0649
N01222 G00 Z-.6019
N01223 Y-1.5087
N01224 G01 Z-.8438 F6.4
N01225 G03 X-.0004 Y-1.5087 I0 J.0618 F28.
N01226 X-.0004 Y-1.3383 I0 J.0852
N01227 X-.0004 Y-1.6024 I0 J-.132
N01228 X-.0004 Y-1.2445 I0 J.1789
N01229 X-.0004 Y-1.6962 I0 J-.2258
N01230 X-.0004 Y-1.1508 I0 J.2727
N01231 X-.0004 Y-1.7899 I0 J-.3195
N01232 X-.0004 Y-1.057 I0 J.3664
N01233 X-.0004 Y-1.8837 I0 J-.4133
N01234 X-.0004 Y-.9633 I0 J.4602
N01235 X-.0004 Y-1.9774 I0 J-.507
N01236 X-.0004 Y-.8695 I0 J.5539
N01237 X-.0004 Y-2.0712 I0 J-.6008
N01238 X-.0004 Y-.7758 I0 J.6477
N01239 X-.0004 Y-2.1649 I0 J-.6945
N01240 X-.0004 Y-2.1649 I0 J.718
N01241 G01 Y-2.0649
N01242 G00 Z.1
(START OF OPERATION: SolidMill - Contouring)
N01243 G00 G54 (Assuming G54)
N01244 X-4.7136 Y2.5538
N01245 Z.1
N01246 G01 Z-.175 F6.4
N01247 X-4.802 Y2.4654 F28.
N01248 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01249 G01 X-4.5987 Y2.4919
N01250 X-4.205 Y2.8856
N01251 X-4.1785 Y2.9121
N01252 G03 X-4.1785 Y3.0889 I-.0884 J.0884

N01253 G01 X-4.2669 Y3.0005
N01254 Z.1 F6.4
N01255 G00 X-4.7136 Y2.5538
N01256 G01 Z-.225
N01257 X-4.802 Y2.4654 F28.
N01258 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01259 G01 X-4.5987 Y2.4919
N01260 X-4.205 Y2.8856
N01261 X-4.1785 Y2.9121
N01262 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01263 G01 X-4.2669 Y3.0005
N01264 Z.1 F6.4
N01265 G00 X-4.7136 Y2.5538
N01266 G01 Z-.275
N01267 X-4.802 Y2.4654 F28.
N01268 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01269 G01 X-4.5987 Y2.4919
N01270 X-4.205 Y2.8856
N01271 X-4.1785 Y2.9121
N01272 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01273 G01 X-4.2669 Y3.0005
N01274 Z.1 F6.4
N01275 G00 X-4.7136 Y2.5538
N01276 G01 Z-.325
N01277 X-4.802 Y2.4654 F28.
N01278 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01279 G01 X-4.5987 Y2.4919
N01280 X-4.205 Y2.8856
N01281 X-4.1785 Y2.9121
N01282 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01283 G01 X-4.2669 Y3.0005
N01284 Z.1 F6.4
N01285 G00 X-4.7136 Y2.5538
N01286 G01 Z-.375
N01287 X-4.802 Y2.4654 F28.
N01288 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01289 G01 X-4.5987 Y2.4919
N01290 X-4.205 Y2.8856
N01291 X-4.1785 Y2.9121
N01292 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01293 G01 X-4.2669 Y3.0005
N01294 Z.1 F6.4
N01295 G00 X-4.7136 Y2.5538
N01296 G01 Z-.425
N01297 X-4.802 Y2.4654 F28.
N01298 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01299 G01 X-4.5987 Y2.4919
N01300 X-4.205 Y2.8856
N01301 X-4.1785 Y2.9121
N01302 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01303 G01 X-4.2669 Y3.0005
N01304 Z.1 F6.4
N01305 G00 X-4.7136 Y2.5538
N01306 G01 Z-.475
N01307 X-4.802 Y2.4654 F28.
N01308 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01309 G01 X-4.5987 Y2.4919
N01310 X-4.205 Y2.8856
N01311 X-4.1785 Y2.9121
N01312 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01313 G01 X-4.2669 Y3.0005
N01314 Z.1 F6.4
N01315 G00 X-4.7136 Y2.5538
N01316 G01 Z-.525
N01317 X-4.802 Y2.4654 F28.
N01318 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01319 G01 X-4.5987 Y2.4919
N01320 X-4.205 Y2.8856
N01321 X-4.1785 Y2.9121
N01322 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01323 G01 X-4.2669 Y3.0005
N01324 Z.1 F6.4
N01325 G00 X-4.7136 Y2.5538
N01326 G01 Z-.575
N01327 X-4.802 Y2.4654 F28.
N01328 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01329 G01 X-4.5987 Y2.4919
N01330 X-4.205 Y2.8856
N01331 X-4.1785 Y2.9121
N01332 G03 X-4.1785 Y3.0889 I-.0884
J.0884

N01333 G01 X-4.2669 Y3.0005
N01334 Z.1 F6.4
N01335 G00 X-4.7136 Y2.5538
N01336 G01 Z-.625
N01337 X-4.802 Y2.4654 F28.
N01338 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01339 G01 X-4.5987 Y2.4919
N01340 X-4.205 Y2.8856
N01341 X-4.1785 Y2.9121
N01342 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01343 G01 X-4.2669 Y3.0005
N01344 Z.1 F6.4
N01345 G00 X-4.7136 Y2.5538
N01346 G01 Z-.675
N01347 X-4.802 Y2.4654 F28.
N01348 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01349 G01 X-4.5987 Y2.4919
N01350 X-4.205 Y2.8856
N01351 X-4.1785 Y2.9121
N01352 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01353 G01 X-4.2669 Y3.0005
N01354 Z.1 F6.4
N01355 G00 X-4.7136 Y2.5538
N01356 G01 Z-.725
N01357 X-4.802 Y2.4654 F28.
N01358 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01359 G01 X-4.5987 Y2.4919
N01360 X-4.205 Y2.8856
N01361 X-4.1785 Y2.9121
N01362 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01363 G01 X-4.2669 Y3.0005
N01364 Z.1 F6.4
N01365 G00 X-4.7136 Y2.5538
N01366 G01 Z-.775
N01367 X-4.802 Y2.4654 F28.
N01368 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01369 G01 X-4.5987 Y2.4919
N01370 X-4.205 Y2.8856
N01371 X-4.1785 Y2.9121
N01372 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01373 G01 X-4.2669 Y3.0005
N01374 Z.1 F6.4
N01375 G00 X-4.7136 Y2.5538
N01376 G01 Z-.825
N01377 X-4.802 Y2.4654 F28.
N01378 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01379 G01 X-4.5987 Y2.4919
N01380 X-4.205 Y2.8856
N01381 X-4.1785 Y2.9121
N01382 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01383 G01 X-4.2669 Y3.0005
N01384 Z.1 F6.4
N01385 G00 X-4.7136 Y2.5538
N01386 G01 Z-.875
N01387 X-4.802 Y2.4654 F28.
N01388 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01389 G01 X-4.5987 Y2.4919
N01390 X-4.205 Y2.8856
N01391 X-4.1785 Y2.9121
N01392 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01393 G01 X-4.2669 Y3.0005
N01394 Z.1 F6.4
N01395 G00 X-4.7136 Y2.5538
N01396 G01 Z-.925
N01397 X-4.802 Y2.4654 F28.
N01398 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01399 G01 X-4.5987 Y2.4919
N01400 X-4.205 Y2.8856
N01401 X-4.1785 Y2.9121
N01402 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01403 G01 X-4.2669 Y3.0005
N01404 Z.1 F6.4
N01405 G00 X-4.7136 Y2.5538
N01406 G01 Z-.975
N01407 X-4.802 Y2.4654 F28.
N01408 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01409 G01 X-4.5987 Y2.4919
N01410 X-4.205 Y2.8856
N01411 X-4.1785 Y2.9121
N01412 G03 X-4.1785 Y3.0889 I-.0884
J.0884

N01413 G01 X-4.2669 Y3.0005
N01414 Z.1 F6.4
N01415 G00 X-4.7136 Y2.5538
N01416 G01 Z-1.025
N01417 X-4.802 Y2.4654 F28.
N01418 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01419 G01 X-4.5987 Y2.4919
N01420 X-4.205 Y2.8856
N01421 X-4.1785 Y2.9121
N01422 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01423 G01 X-4.2669 Y3.0005
N01424 Z.1 F6.4
N01425 G00 X-4.7136 Y2.5538
N01426 G01 Z-1.042
N01427 X-4.802 Y2.4654 F28.
N01428 G03 X-4.6252 Y2.4654 I.0884 J.0884
N01429 G01 X-4.5987 Y2.4919
N01430 X-4.205 Y2.8856
N01431 X-4.1785 Y2.9121
N01432 G03 X-4.1785 Y3.0889 I-.0884
J.0884
N01433 G01 X-4.2669 Y3.0005
N01434 Z.1 F6.4
(START OF OPERATION: SolidMill -
Contouring)
N01435 G00 G54 (Assuming G54)
N01436 X4.266 Y3.0005
N01437 Z.1
N01438 G01 Z-.175
N01439 X4.1776 Y3.0889 F28.
N01440 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01441 G01 X4.2041 Y2.8856
N01442 X4.5978 Y2.4919
N01443 X4.6243 Y2.4654
N01444 G03 X4.8011 Y2.4654 I.0884 J.0884
N01445 G01 X4.7127 Y2.5538
N01446 Z.1 F6.4
N01447 G00 X4.266 Y3.0005
N01448 G01 Z-.225
N01449 X4.1776 Y3.0889 F28.
N01450 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01451 G01 X4.2041 Y2.8856
N01452 X4.5978 Y2.4919
N01453 X4.6243 Y2.4654
N01454 G03 X4.8011 Y2.4654 I.0884 J.0884
N01455 G01 X4.7127 Y2.5538
N01456 Z.1 F6.4
N01457 G00 X4.266 Y3.0005
N01458 G01 Z-.275
N01459 X4.1776 Y3.0889 F28.
N01460 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01461 G01 X4.2041 Y2.8856
N01462 X4.5978 Y2.4919
N01463 X4.6243 Y2.4654
N01464 G03 X4.8011 Y2.4654 I.0884 J.0884
N01465 G01 X4.7127 Y2.5538
N01466 Z.1 F6.4
N01467 G00 X4.266 Y3.0005
N01468 G01 Z-.325
N01469 X4.1776 Y3.0889 F28.
N01470 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01471 G01 X4.2041 Y2.8856
N01472 X4.5978 Y2.4919
N01473 X4.6243 Y2.4654
N01474 G03 X4.8011 Y2.4654 I.0884 J.0884
N01475 G01 X4.7127 Y2.5538
N01476 Z.1 F6.4
N01477 G00 X4.266 Y3.0005
N01478 G01 Z-.375
N01479 X4.1776 Y3.0889 F28.
N01480 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01481 G01 X4.2041 Y2.8856
N01482 X4.5978 Y2.4919
N01483 X4.6243 Y2.4654
N01484 G03 X4.8011 Y2.4654 I.0884 J.0884
N01485 G01 X4.7127 Y2.5538
N01486 Z.1 F6.4
N01487 G00 X4.266 Y3.0005
N01488 G01 Z-.425
N01489 X4.1776 Y3.0889 F28.
N01490 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01491 G01 X4.2041 Y2.8856
N01492 X4.5978 Y2.4919
N01493 X4.6243 Y2.4654
N01494 G03 X4.8011 Y2.4654 I.0884 J.0884
N01495 G01 X4.7127 Y2.5538
N01496 Z.1 F6.4

N01497 G00 X4.266 Y3.0005
N01498 G01 Z-.475
N01499 X4.1776 Y3.0889 F28.
N01500 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01501 G01 X4.2041 Y2.8856
N01502 X4.5978 Y2.4919
N01503 X4.6243 Y2.4654
N01504 G03 X4.8011 Y2.4654 I.0884 J.0884
N01505 G01 X4.7127 Y2.5538
N01506 Z.1 F6.4
N01507 G00 X4.266 Y3.0005
N01508 G01 Z-.525
N01509 X4.1776 Y3.0889 F28.
N01510 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01511 G01 X4.2041 Y2.8856
N01512 X4.5978 Y2.4919
N01513 X4.6243 Y2.4654
N01514 G03 X4.8011 Y2.4654 I.0884 J.0884
N01515 G01 X4.7127 Y2.5538
N01516 Z.1 F6.4
N01517 G00 X4.266 Y3.0005
N01518 G01 Z-.575
N01519 X4.1776 Y3.0889 F28.
N01520 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01521 G01 X4.2041 Y2.8856
N01522 X4.5978 Y2.4919
N01523 X4.6243 Y2.4654
N01524 G03 X4.8011 Y2.4654 I.0884 J.0884
N01525 G01 X4.7127 Y2.5538
N01526 Z.1 F6.4
N01527 G00 X4.266 Y3.0005
N01528 G01 Z-.625
N01529 X4.1776 Y3.0889 F28.
N01530 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01531 G01 X4.2041 Y2.8856
N01532 X4.5978 Y2.4919
N01533 X4.6243 Y2.4654
N01534 G03 X4.8011 Y2.4654 I.0884 J.0884
N01535 G01 X4.7127 Y2.5538
N01536 Z.1 F6.4
N01537 G00 X4.266 Y3.0005
N01538 G01 Z-.675
N01539 X4.1776 Y3.0889 F28.
N01540 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01541 G01 X4.2041 Y2.8856
N01542 X4.5978 Y2.4919
N01543 X4.6243 Y2.4654
N01544 G03 X4.8011 Y2.4654 I.0884 J.0884
N01545 G01 X4.7127 Y2.5538
N01546 Z.1 F6.4
N01547 G00 X4.266 Y3.0005
N01548 G01 Z-.725
N01549 X4.1776 Y3.0889 F28.
N01550 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01551 G01 X4.2041 Y2.8856
N01552 X4.5978 Y2.4919
N01553 X4.6243 Y2.4654
N01554 G03 X4.8011 Y2.4654 I.0884 J.0884
N01555 G01 X4.7127 Y2.5538
N01556 Z.1 F6.4
N01557 G00 X4.266 Y3.0005
N01558 G01 Z-.775
N01559 X4.1776 Y3.0889 F28.
N01560 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01561 G01 X4.2041 Y2.8856
N01562 X4.5978 Y2.4919
N01563 X4.6243 Y2.4654
N01564 G03 X4.8011 Y2.4654 I.0884 J.0884
N01565 G01 X4.7127 Y2.5538
N01566 Z.1 F6.4
N01567 G00 X4.266 Y3.0005
N01568 G01 Z-.825
N01569 X4.1776 Y3.0889 F28.
N01570 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01571 G01 X4.2041 Y2.8856
N01572 X4.5978 Y2.4919
N01573 X4.6243 Y2.4654
N01574 G03 X4.8011 Y2.4654 I.0884 J.0884
N01575 G01 X4.7127 Y2.5538
N01576 Z.1 F6.4
N01577 G00 X4.266 Y3.0005
N01578 G01 Z-.875
N01579 X4.1776 Y3.0889 F28.
N01580 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01581 G01 X4.2041 Y2.8856
N01582 X4.5978 Y2.4919
N01583 X4.6243 Y2.4654
N01584 G03 X4.8011 Y2.4654 I.0884 J.0884

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N01585 G01 X4.7127 Y2.5538
N01586 Z.1 F6.4
N01587 G00 X4.266 Y3.0005
N01588 G01 Z-.925
N01589 X4.1776 Y3.0889 F28.
N01590 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01591 G01 X4.2041 Y2.8856
N01592 X4.5978 Y2.4919
N01593 X4.6243 Y2.4654
N01594 G03 X4.8011 Y2.4654 I.0884 J.0884
N01595 G01 X4.7127 Y2.5538
N01596 Z.1 F6.4
N01597 G00 X4.266 Y3.0005
N01598 G01 Z-.975
N01599 X4.1776 Y3.0889 F28.
N01600 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01601 G01 X4.2041 Y2.8856
N01602 X4.5978 Y2.4919
N01603 X4.6243 Y2.4654
N01604 G03 X4.8011 Y2.4654 I.0884 J.0884
N01605 G01 X4.7127 Y2.5538
N01606 Z.1 F6.4
N01607 G00 X4.266 Y3.0005
N01608 G01 Z-1.025
N01609 X4.1776 Y3.0889 F28.
N01610 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01611 G01 X4.2041 Y2.8856
N01612 X4.5978 Y2.4919
N01613 X4.6243 Y2.4654
N01614 G03 X4.8011 Y2.4654 I.0884 J.0884
N01615 G01 X4.7127 Y2.5538
N01616 Z.1 F6.4
N01617 G00 X4.266 Y3.0005
N01618 G01 Z-1.042
N01619 X4.1776 Y3.0889 F28.
N01620 G03 X4.1776 Y2.9121 I.0884 J-.0884
N01621 G01 X4.2041 Y2.8856
N01622 X4.5978 Y2.4919
N01623 X4.6243 Y2.4654
N01624 G03 X4.8011 Y2.4654 I.0884 J.0884
N01625 G01 X4.7127 Y2.5538
N01626 Z.1 F6.4
N01627 G00 Z.1
N01628 G00 G90
N01629 G00 G53 Z0.0
N01630 G00 G53 X-15. Y0.
N01631 M30
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