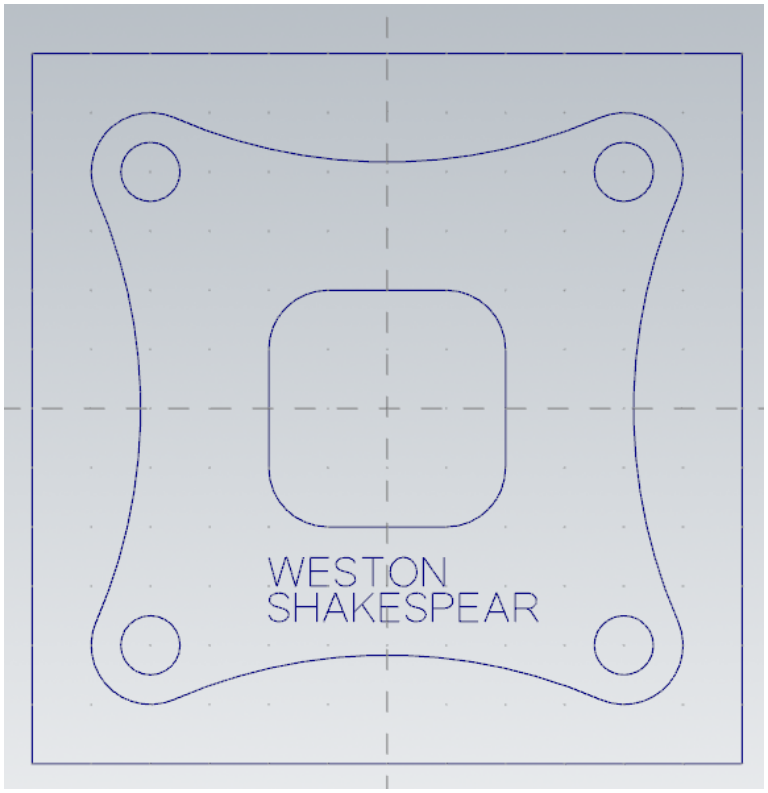
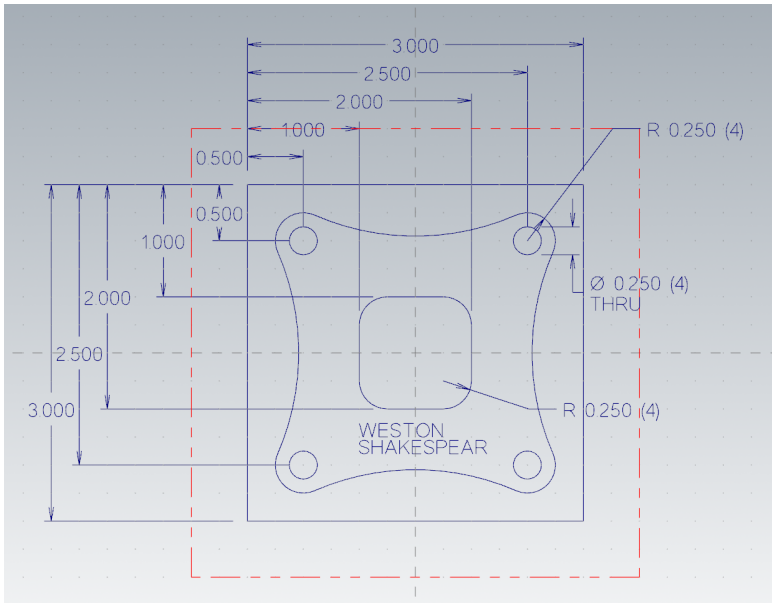
Report by Weston Shakespear
Spring 2023

CCET 3680
Mill Lesson 5 Second Exercise

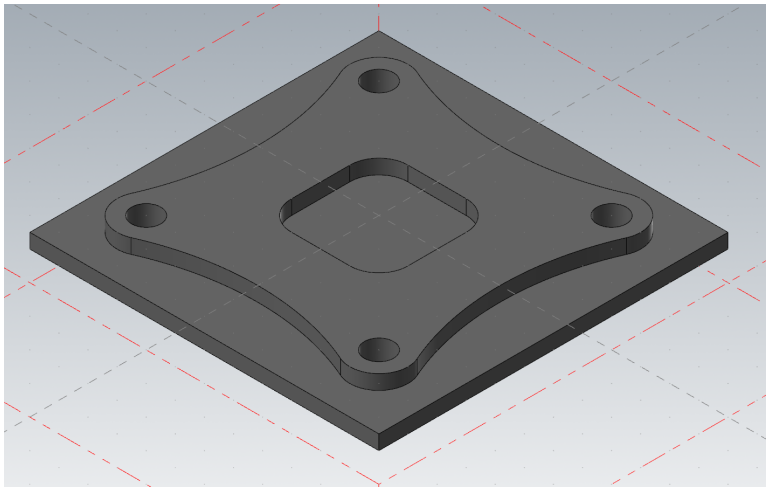
I. Wireframe:



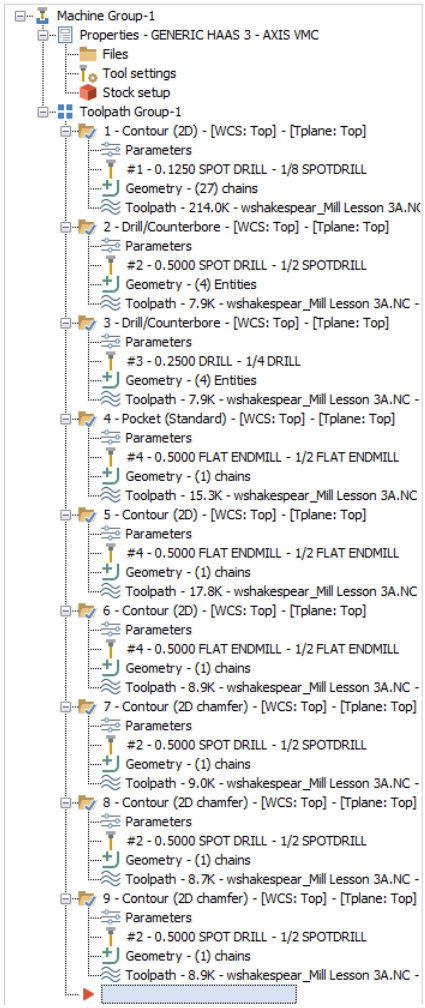
II. Dimensions:



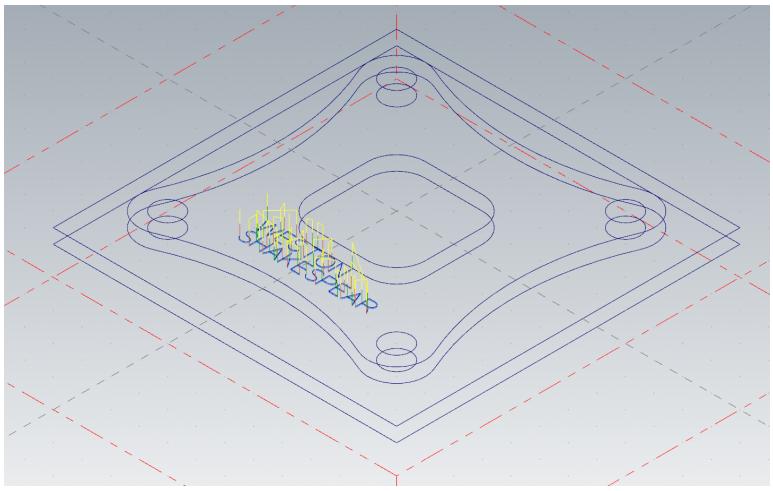
III. Solid:



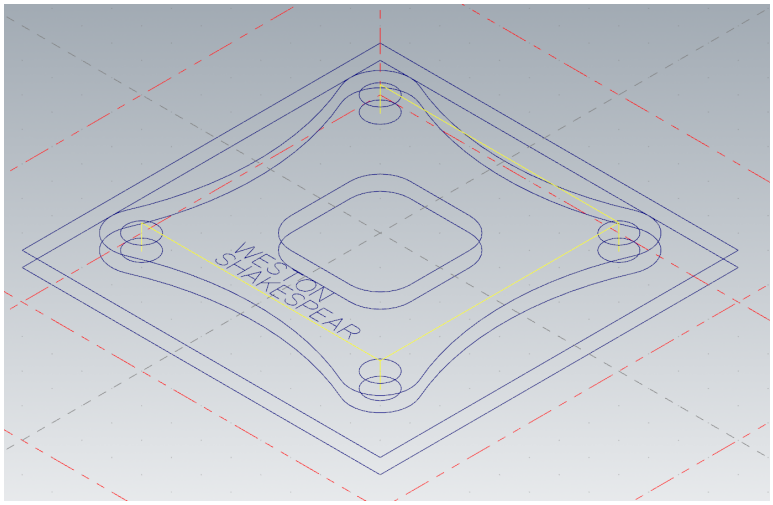
IV. Toolpaths:



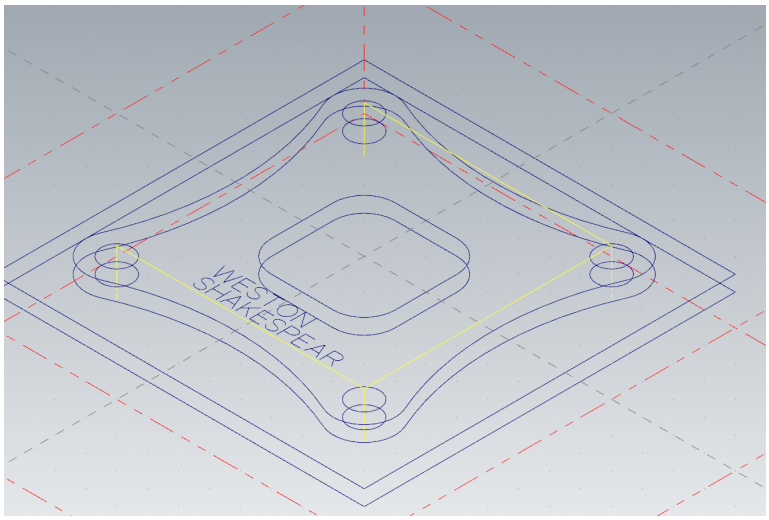
V. Name 2D Contour:



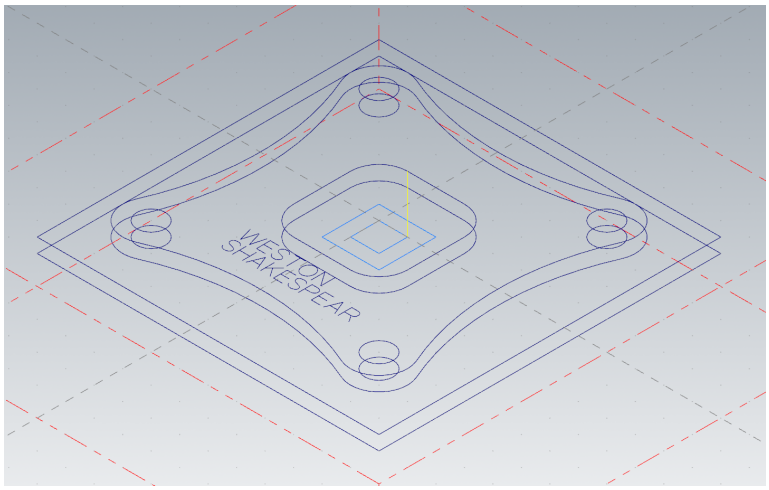
VI. Spot Drill:



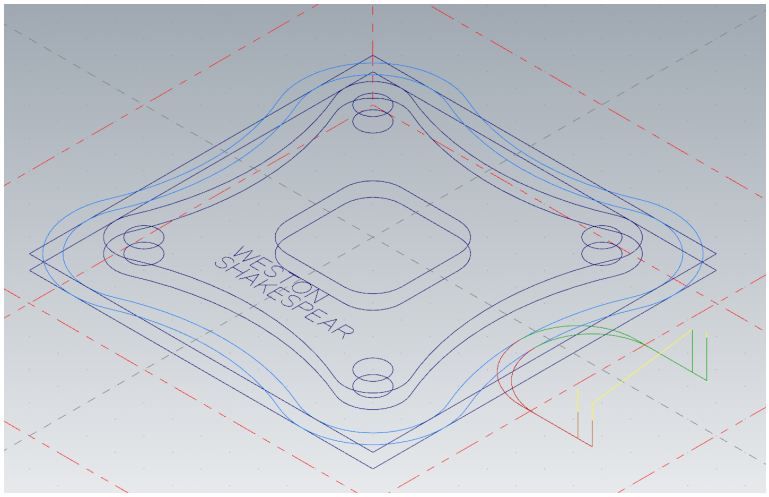
VII. Peck Drill:



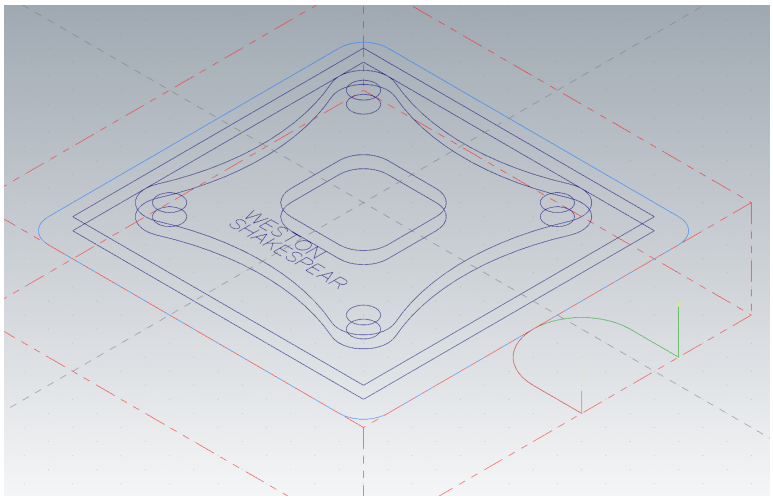
VIII. 2D Pocket:



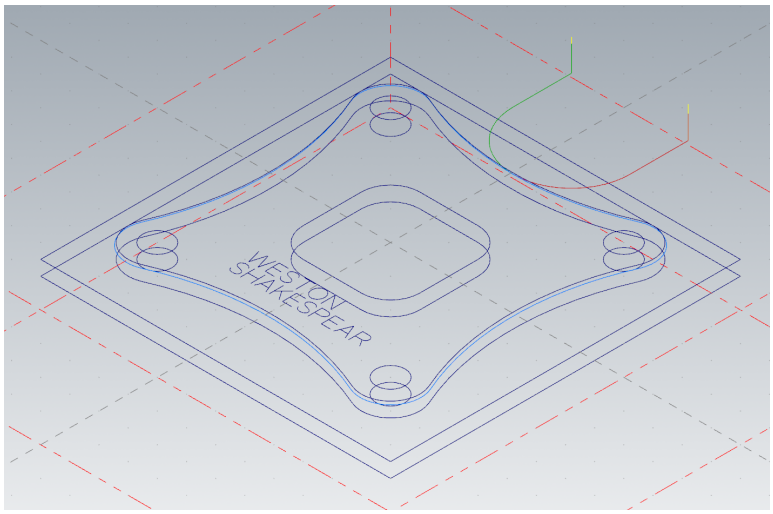
IX. 2D Contour:

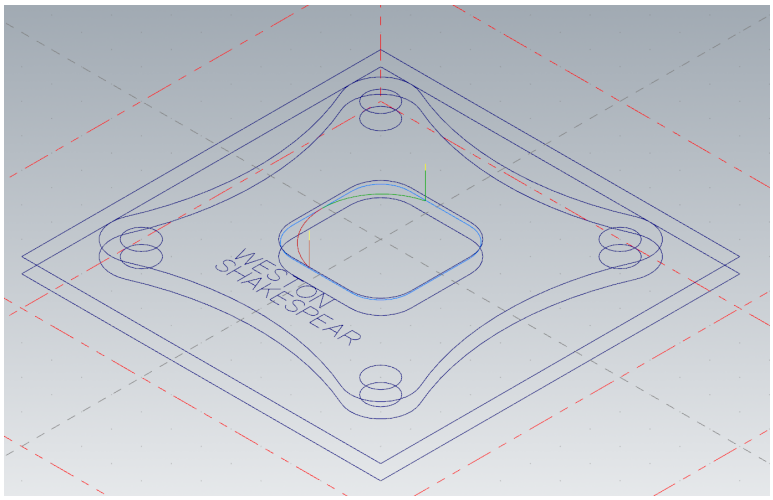


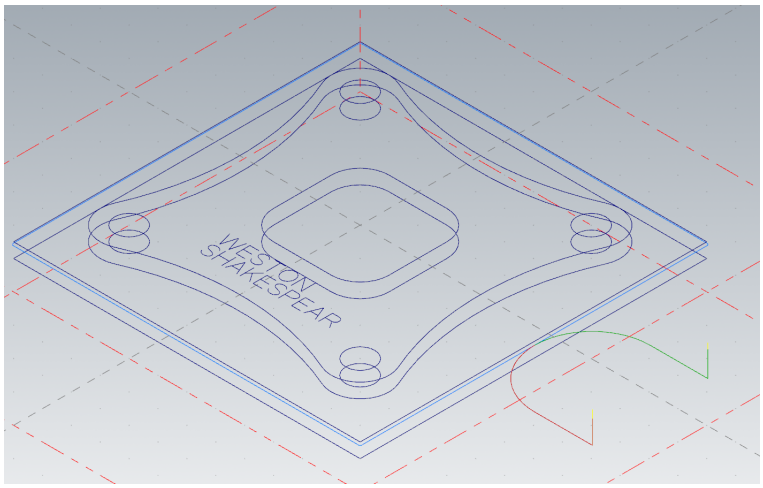
X. 2D Contour:



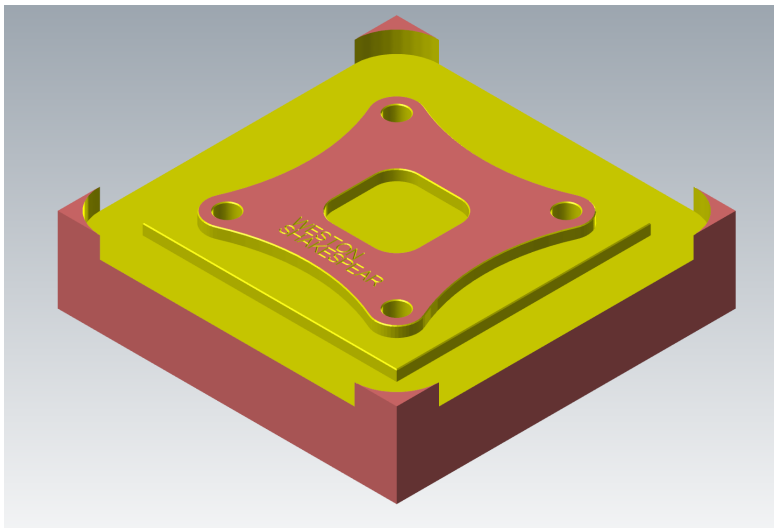
XI. 2D Chamfer Contour:







XIV. Final Solid:



XV. Method:

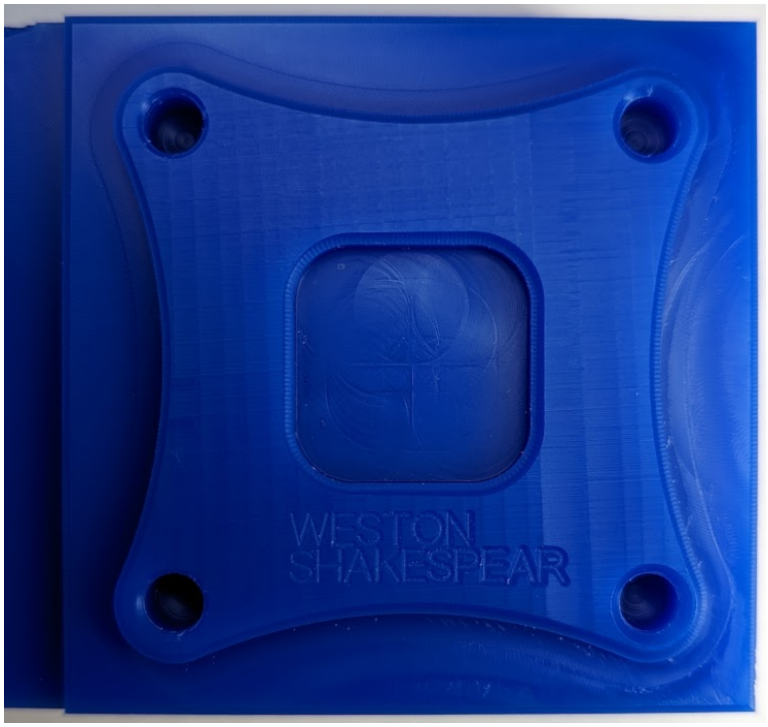
I just used a basic center anchored rectangle for the perimeter of the geometry. For the wireframe in the center I first created the inner circle then drew a line and manually assigned 30 degrees to the angle, this let me create the equidistant triangle in the center, from there I drew the 3 circles and then used the tangent 2 entities to complete the center.

Then I drew one copy of the radially symmetric portion and used a polar copy to finish the wireframe.

XIV. GCode Changes

To modify my gcode to be compatible with the machine I first made sure the HAAS 3 axis post processor was selected when exporting the gcode. Then I removed the long lines at the beginning and edited the last G28 home command to not zero the x axis.

XV. Finished Part



XVI. Gcode:

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%
O33006
(WSHAKESPEAR_MILL LESSON 5TUT)
(DATE=DD-MM-YY - 03-02-23 TIME=HH:MM - 12:04)
(MCAM FILE - C:\USERS\WESTONSHAKESPEAR\DOWNLOADS\WSHAKESPEAR_MILL LESSON
5TUT.E)
(NC FILE - C:\USERS\WESTONSHAKESPEAR\DOWNLOADS\GCODE\WSHAKESPEAR_MILL LESSON
5T)
(MATERIAL - ALUMINUM INCH - 6061)
(T3|1/2 SPOTDRILL|H3|D3|TOOL DIA. - .5)
(T5|1/4 DRILL|H5|D5|TOOL DIA. - .25)
(T4|1/2 FLAT ENDMILL|H4|D4|TOOL DIA. - .5)
(T8|1/8 SPOTDRILL|H8|D8|TOOL DIA. - .125)
N100 G20
N110 G0 G17 G40 G49 G80 G90
N120 T3 M6
N130 G187 P3 E.001
N140 G0 G90 G54 X-1. Y1. S5000 M3
N150 G43 H3 Z.075
N160 M8
N170 G99 G81 Z-.135 R.075 F40.
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N180 X1.
N190 Y-1.
N200 X-1.
N210 G80
N220 M5
N230 G91 G28 Z0. M9
N240 M01
N250 T5 M6
N260 G187 P3 E.001
N270 G0 G90 G54 X-1. Y1. S5000 M3
N280 G43 H5 Z.075
N290 M8
N300 G99 G81 Z-.405 R.075 F40.
N310 X1.
N320 Y-1.
N330 X-1.
N340 G80
N350 M5
N360 G91 G28 Z0. M9
N370 M01
N380 T4 M6
N390 G187
N400 G0 G90 X.125 Y.125 S5000 M3
N410 G43 H4 Z.25
N420 M8
N430 Z.2
N440 G1 Z-.125 F6.4
N450 X-.125 F40.
N460 Y-.125
N470 X.125
N480 Y.125
N490 G0 Z.125
N500 Z.2
N510 X0. Y.25
N520 G1 Z-.125 F6.4
N530 X-.25 F40.
N540 Y-.25
N550 X.25
N560 Y.25
N570 X0.
N580 G0 Z.25
N590 G187 P3 E.001
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N600 X2.4163 Y.5
N610 Z.2
N620 G1 Z-.125 F6.4
N630 X1.9163 F40.
N640 G3 X1.4163 Y0. I0. J-.5
N650 X1.5728 Y-.75 I1.875 J0.
N660 G2 X1.625 Y-1. I-.5728 J-.25
N670 X1. Y-1.625 I-.625 J0.
N680 X.75 Y-1.5728 I0. J.625
N690 G3 X0. Y-1.4163 I-.75 J-1.7185
N700 X-.75 Y-1.5728 I0. J-1.875
N710 G2 X-1. Y-1.625 I-.25 J.5728
N720 X-1.625 Y-1. I0. J.625
N730 X-1.5728 Y-.75 I.625 J0.
N740 G3 X-1.4163 Y0. I-1.7185 J.75
N750 X-1.5728 Y.75 I-1.875 J0.
N760 G2 X-1.625 Y1. I.5728 J.25
N770 X-1. Y1.625 I.625 J0.
N780 X-.75 Y1.5728 I0. J-.625
N790 G3 X0. Y1.4163 I.75 J1.7185
N800 X.75 Y1.5728 I0. J1.875
N810 G2 X1. Y1.625 I.25 J-.5728
N820 X1.625 Y1. I0. J-.625
N830 X1.5728 Y.75 I-.625 J0.
N840 G3 X1.4163 Y0. I1.7185 J-.75
N850 X1.9163 Y-.5 I.5 J0.
N860 G1 X2.4163
N870 Z.075 F6.4
N880 G0 Z.125
N890 Z.2
N900 X2.2913 Y.5
N910 G1 Z-.125
N920 X1.7913 F40.
N930 G3 X1.2913 Y0. I0. J-.5
N940 X1.4583 Y-.8 I2. J0.
N950 G2 X1.5 Y-1. I-.4583 J-.2
N960 X1. Y-1.5 I-.5 J0.
N970 X.8 Y-1.4583 I0. J.5
N980 G3 X0. Y-1.2913 I-.8 J-1.833
N990 X-.8 Y-1.4583 I0. J-2.
N1000 G2 X-1. Y-1.5 I-.2 J.4583
N1010 X-1.5 Y-1. I0. J.5
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N1020 X-1.4583 Y-.8 I.5 J0.
N1030 G3 X-1.2913 Y0. I-1.833 J.8
N1040 X-1.4583 Y.8 I-2. J0.
N1050 G2 X-1.5 Y1. I.4583 J.2
N1060 X-1. Y1.5 I.5 J0.
N1070 X-.8 Y1.4583 I0. J-.5
N1080 G3 X0. Y1.2913 I.8 J1.833
N1090 X.8 Y1.4583 I0. J2.
N1100 G2 X1. Y1.5 I.2 J-.4583
N1110 X1.5 Y1. I0. J-.5
N1120 X1.4583 Y.8 I-.5 J0.
N1130 G3 X1.2913 Y0. I1.833 J-.8
N1140 X1.7913 Y-.5 I.5 J0.
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N1160 Z.075 F6.4
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N1200 Z.2
N1210 G1 Z-.25
N1220 X2.25 F40.
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N1240 G1 Y-1.5
N1250 G2 X1.5 Y-1.75 I-.25 J0.
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N1270 G2 X-1.75 Y-1.5 I0. J.25
N1280 G1 Y1.5
N1290 G2 X-1.5 Y1.75 I.25 J0.
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N1310 G2 X1.75 Y1.5 I0. J-.25
N1320 G1 Y0.
N1330 G3 X2.25 Y-.5 I.5 J0.
N1340 G1 X2.75
N1350 Z-.05 F6.4
N1360 G0 Z.25
N1370 M5
N1380 G91 G28 Z0. M9
N1390 M01
N1400 T3 M6
N1410 G187 P3 E.001
N1420 G0 G90 G54 X-.5 Y2.0513 S5000 M3
N1430 G43 H3 Z.25
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N1440 M8
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N1490 X.896 Y1.2383 I0. J2.24
N1500 G2 X1. Y1.26 I.104 J-.2383
N1510 X1.26 Y1. I0. J-.26
N1520 X1.2383 Y.896 I-.26 J0.
N1530 G3 X1.0513 Y0. I2.053 J-.896
N1540 X1.2383 Y-.896 I2.24 J0.
N1550 G2 X1.26 Y-1. I-.2383 J-.104
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N1580 G3 X0. Y-1.0513 I-.896 J-2.053
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N1610 X-1.26 Y-1. I0. J.26
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N1690 X.5 Y1.5513 I0. J.5
N1700 G1 Y2.0513
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N1720 G0 Z.25
N1730 G187 P3 E.001
N1740 X-.1116 Y.485
N1750 Z.2
N1760 G1 Z-.02
N1770 G3 X-.49 Y0. I.1216 J-.485 F40.
N1780 G1 Y-.25
N1790 G3 X-.25 Y-.49 I.24 J0.
N1800 G1 X.25
N1810 G3 X.49 Y-.25 I0. J.24
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N1830 G3 X.25 Y.49 I-.24 J0.
N1840 G1 X-.25
N1850 G3 X-.49 Y.25 I0. J-.24
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N1940 X2.01 F40.
N1950 G3 X1.51 Y0. I0. J-.5
N1960 G1 Y-1.5
N1970 G2 X1.5 Y-1.51 I-.01 J0.
N1980 G1 X-1.5
N1990 G2 X-1.51 Y-1.5 I0. J.01
N2000 G1 Y1.5
N2010 G2 X-1.5 Y1.51 I.01 J0.
N2020 G1 X1.5
N2030 G2 X1.51 Y1.5 I0. J-.01
N2040 G1 Y0.
N2050 G3 X2.01 Y-.5 I.5 J0.
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N2080 G0 Z.125
N2090 M5
N2100 G91 G28 Z0. M9
N2110 M01
N2120 T8 M6
N2130 G187 P3 E.001
N2140 G0 G90 G54 X-.4995 Y-.6279 S5000 M3
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N2180 X-.466 Y-.7517 F40.
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N2490 X-.1935 Y-.6846
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N2550 X-.204 Y-.6372
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N3600 Z.092 F6.4
N3610 G0 Z.192
N3620 Z.2
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N3650 G1 Z-.008
N3660 X.4951 F40.
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N3690 Z.2
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N3710 Z.1
N3720 G1 Z-.008
N3730 X.4624 Y-.7779 F40.
N3740 X.4124 Y-.9017
N3750 Z.092 F6.4
N3760 G0 Z.192
N3770 Z.2
N3780 X.3849 Y-.9
N3790 Z.1
N3800 G1 Z-.008
N3810 X.3059 F40.
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N3830 X.3849
N3840 Z.092 F6.4
N3850 G0 Z.192
N3860 Z.2
N3870 X.5407 Y-.8443
N3880 Z.1
N3890 G1 Z-.008
N3900 X.596 F40.
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N3920 X.6198 Y-.8356
N3930 X.6274 Y-.8253
N3940 X.6303 Y-.8121
N3950 X.6274 Y-.7988
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N3970 X.6089 Y-.7823
N3980 X.596 Y-.7798
N3990 X.5407
N4000 Y-.9017
N4010 Z.092 F6.4
N4020 G0 Z.192
N4030 Z.2
N4040 X.5888 Y-.8443
N4050 Z.1
N4060 G1 Z-.008
N4070 X.6022 Y-.8518 F40.
N4080 X.6123 Y-.8634
N4090 X.6369 Y-.9017
N4100 Z.092 F6.4
N4110 G0 Z.192
N4120 Z.2
N4130 X.2405 Y-.6279
N4140 Z.1
N4150 G1 Z-.008
N4160 Y-.7517 F40.
N4170 X.1534 Y-.6279
N4180 Y-.7517
N4190 Z.092 F6.4
N4200 G0 Z.192
N4210 Z.2
N4220 X.1252 Y-.6901
N4230 Z.1
N4240 G1 Z-.008
N4250 X.1212 Y-.6673 F40.
N4260 X.1208 Y-.6662
N4270 X.1155 Y-.6557
N4280 X.1086 Y-.6467
N4290 X.0908 Y-.6335
N4300 X.0804 Y-.6297
N4310 X.0694 Y-.6285
N4320 X.0495 Y-.6325
N4330 X.0473 Y-.6335
N4340 X.0296 Y-.6467
N4350 X.0174 Y-.6662
N4360 X.014 Y-.6779
N4370 X.0129 Y-.6901
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N4380 X.0169 Y-.7126
N4390 X.0174 Y-.7138
N4400 X.0296 Y-.7333
N4410 X.0379 Y-.7409
N4420 X.0473 Y-.7465
N4430 X.0579 Y-.75
N4440 X.0694 Y-.7512
N4450 X.0892 Y-.7472
N4460 X.0908 Y-.7465
N4470 X.1003 Y-.7409
N4480 X.1086 Y-.7333
N4490 X.1208 Y-.7138
N4500 X.1241 Y-.7024
N4510 X.1252 Y-.6901
N4520 Z.092 F6.4
N4530 G0 Z.192
N4540 Z.2
N4550 X.0526 Y-.7797
N4560 Z.1
N4570 G1 Z-.008
N4580 X-.0264 F40.
N4590 Y-.9
N4600 X.0526
N4610 Z.092 F6.4
N4620 G0 Z.192
N4630 Z.2
N4640 X-.1683 Y-.9017
N4650 Z.1
N4660 G1 Z-.008
N4670 X-.2183 Y-.7779 F40.
N4680 X-.2684 Y-.9017
N4690 Z.092 F6.4
N4700 G0 Z.192
N4710 Z.2
N4720 X-.2965
N4730 Z.1
N4740 G1 Z-.008
N4750 Y-.7779 F40.
N4760 Z.092 F6.4
N4770 G0 Z.192
N4780 Z.2
N4790 X-.2458 Y-.75
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N4800 Z.1
N4810 G1 Z-.008
N4820 X-.3248 F40.
N4830 Y-.6297
N4840 X-.2458
N4850 Z.092 F6.4
N4860 G0 Z.192
N4870 Z.2
N4880 X-.3872 Y-.7779
N4890 Z.1
N4900 G1 Z-.008
N4910 Y-.9017 F40.
N4920 Z.092 F6.4
N4930 G0 Z.192
N4940 Z.2
N4950 Y-.8372
N4960 Z.1
N4970 G1 Z-.008
N4980 X-.2965 F40.
N4990 Z.092 F6.4
N5000 G0 Z.192
N5010 Z.2
N5020 X-.251 Y-.8599
N5030 Z.1
N5040 G1 Z-.008
N5050 X-.1857 F40.
N5060 Z.092 F6.4
N5070 G0 Z.192
N5080 Z.2
N5090 X-.4169 Y-.8029
N5100 Z.1
N5110 G1 Z-.008
N5120 X-.4226 Y-.7928 F40.
N5130 X-.4317 Y-.7851
N5140 X-.4434 Y-.7805
N5150 X-.4566 Y-.7792
N5160 X-.4723 Y-.7814
N5170 X-.4851 Y-.7872
N5180 X-.4939 Y-.7963
N5190 X-.4972 Y-.8071
N5200 X-.4932 Y-.8209
N5210 X-.4921 Y-.8224
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N5220 X-.4801 Y-.832
N5230 X-.4746 Y-.8346
N5240 X-.4409 Y-.844
N5250 X-.4263 Y-.8512
N5260 X-.422 Y-.8552
N5270 X-.4164 Y-.8657
N5280 X-.4158 Y-.8706
N5290 X-.419 Y-.8815
N5300 X-.4275 Y-.8912
N5310 X-.4402 Y-.8978
N5320 X-.4566 Y-.9
N5330 X-.4695 Y-.8986
N5340 X-.4811 Y-.8945
N5350 X-.4902 Y-.8877
N5360 X-.4957 Y-.8795
N5370 X-.499 Y-.8707
N5380 Z.092 F6.4
N5390 G0 Z.2
N5400 M5
N5410 G91 G28 Z0.
N5420 G28 X0. Y0.
N5430 M30
%
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