Skills Ontario CAM Competition 2021
Post-Secondary

Chair: Mariana Lendel
Co-Chair: George Vassilev

Judges:
George Vassilev

In-House Solutions

Please read the instructions carefully before you start work on the contest
Competition drawings and instructions are not to leave the competition site
If you get stuck with something move on!

Submission Link:

https://www.dropbox.com/request/z3N1jRdrNMigJD9BUN9I

Save the files including your name, school board name, part name and your contest name as shown:

John Doe_ WRDSB_Drone Leg Frame_ CAM
John Doe_ WRDSB_Drone Top Frame_ CAM
John Doe_ WRDSB_Drone Top Cover_ CAM

For additional help with submissions, email skills.help@humber.ca
Time allowed for contest is **5.0 hours**.

The parts are being machined on a vertical spindle machine with a maximum RPM of 15000.

Part 1 – Drone Leg Frame:

1. The part blank has the bottom face pre-machined.
2. The size of the blank material: 15.75” in X, 3.0” in Y and 0.55” in Z from which 0.05” extra stock is at the top.
3. Offset material in Job Setup accordingly.
4. Material: Aluminum 2024
5. **Part is secured to a fixture that is not shown in drawing.**
6. The origin is at the center of the 0.55 diameter hole located in the middle.
7. Z zero = top of the finish part.
8. Ensure you have the appropriate clearance, retract, feed planes, depth, and top of the stock set throughout your toolpaths.
9. Use appropriate tools for roughing and finishing this part. You will be evaluated on the size, depth of cut and type of tools you use to machine this part.
10. Use appropriate toolpaths to rough and finish the part.
11. You will decide on the sequence of machining operations.
12. Spot drill, drill and tap the holes as required.
13. Use the 5/16 diameter drill for the 3/8-16 UNC tap holes.

Part 2 –Drone Top Frame:

14. The size of the blank material: 13.0” in Diameter and 0.725” in Z. Extra stock in Z at the top and bottom of the part should be 0.05” for each side.
15. Offset material in Job Setup accordingly.
16. Material: Aluminum 2024
17. **Part is secured to a fixture that is not shown in drawing.**
18. The origin is located at the center of the part.
19. Z zero = top of the finish part.
20. Ensure you have the appropriate clearance, retract, feed planes, depth, and top of the stock set throughout your toolpaths.
21. Use appropriate tools for roughing and finishing this part. You will be evaluated on the size, depth of cut and type of tools you use to machine this part.
22. Use appropriate toolpaths to rough and finish the part.
23. You will decide on the sequence of machining operations.
24. Spot drill and drill the holes as required.
25. Create a new WCS plane to machine the bottom pockets. Origin located at the bottom of the finish part and center of the part.

Part 3 – Drone Top Cover:

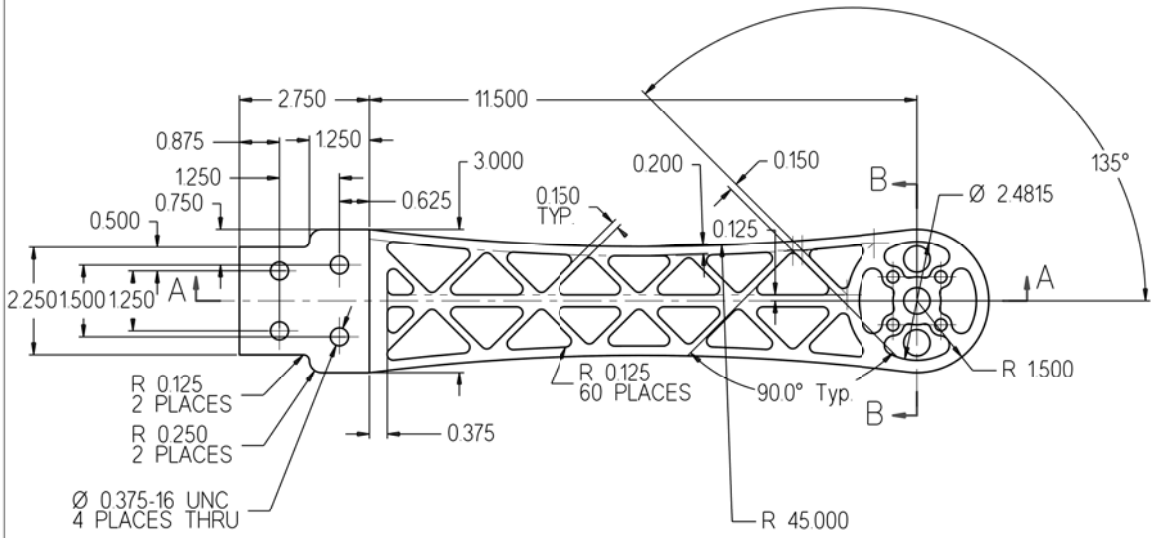
1. Merge the **Logo** file once you draw the geometry. If using HLE open the LOGO file and save it before you are merging the file!
2. The part blank has the bottom and top face pre-machined.
3. The size of the blank material: 36.0” in X, 28.0” in Y and 2.0” in Z.
4. Offset material in Job Setup accordingly.
5. Material: Aluminum 2024
6. **Part is secured to a fixture that is not shown in drawing.**

7. The origin is located at the center of the center of the part.
8. Z zero = top of the finish part.
9. Ensure you have the appropriate clearance, retract, feed planes, depth, and top of the stock set throughout your toolpaths.
10. Use appropriate tools for roughing and finishing this part. You will be evaluated on the size, depth of cut and type of tools you use to machine this part.
11. When possible use one operation to rough and finish.
12. You will decide on the sequence of machining operations.
13. Use a Surface finish toolpath to machine the fillet surface with a 3/8 “Ball Endmill. No roughing operation is required.
14. Create a new WCS plane to machine the bottom pocket. Origin located at the bottom of the finish part and center of the part.

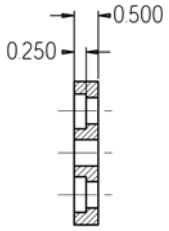
Tool List:

2” Face Mill
1/16” Flat Endmill
¼” Flat Endmill
3/8” Flat Endmill
½” Flat Endmill
1” Flat Endmill
1” Ball Endmill
1/8” Engraver 30 degree 0.005 Tip
½” Chamfer Mill
¾ Spot Drill
¼” Drill
5/16” Drill
3/8” Drill
3/8” -16 Tap

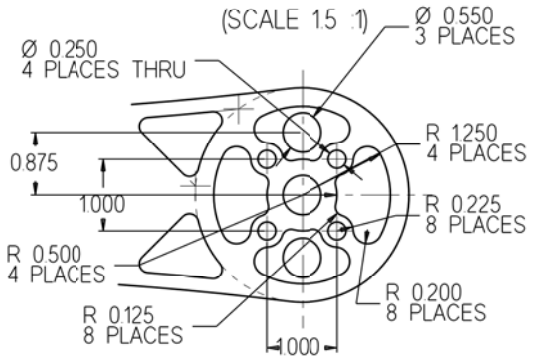
ALL DIMENSIONS IN INCHES



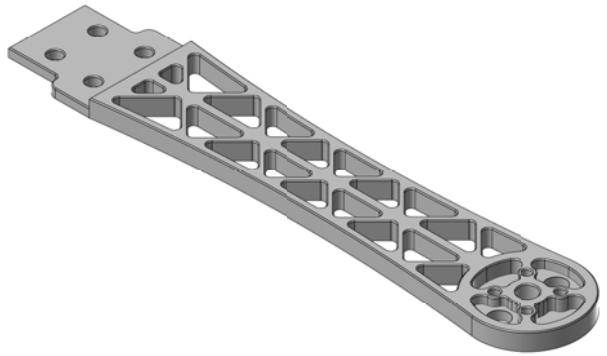
SECTION B - B



DETAIL C
(SCALE 1.5 :1)



SECTION A - A

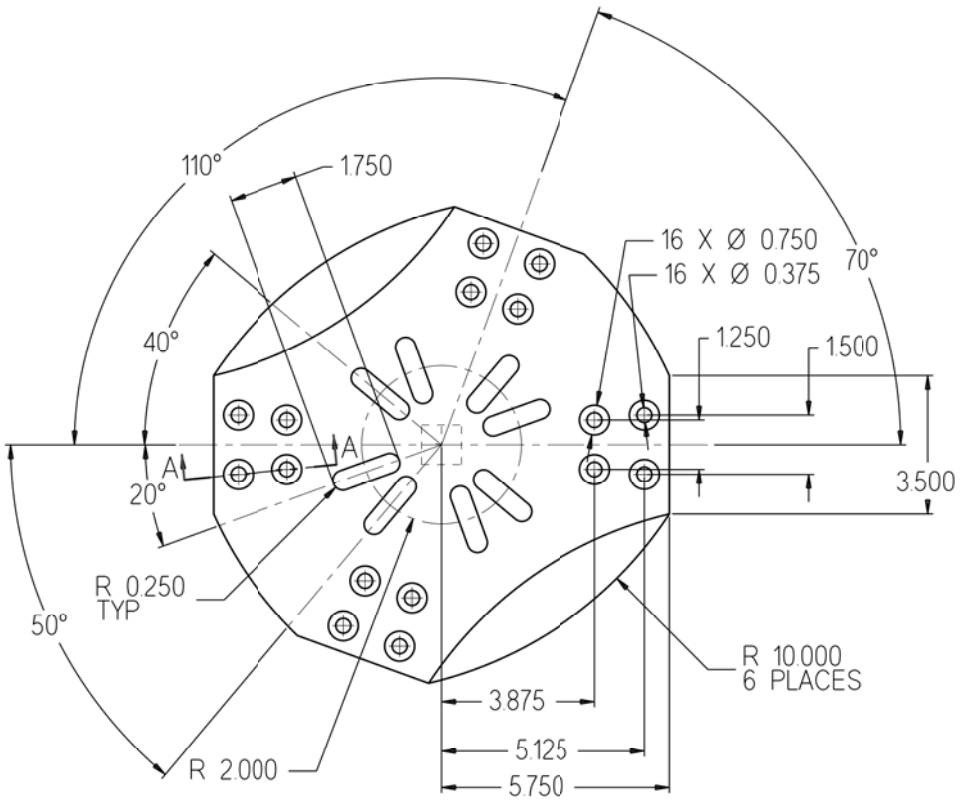


BREAK ALL UNSPECIFIED EDGES AT THE TOP OF THE PART WITH A 0.025 X 45° CHAMFER

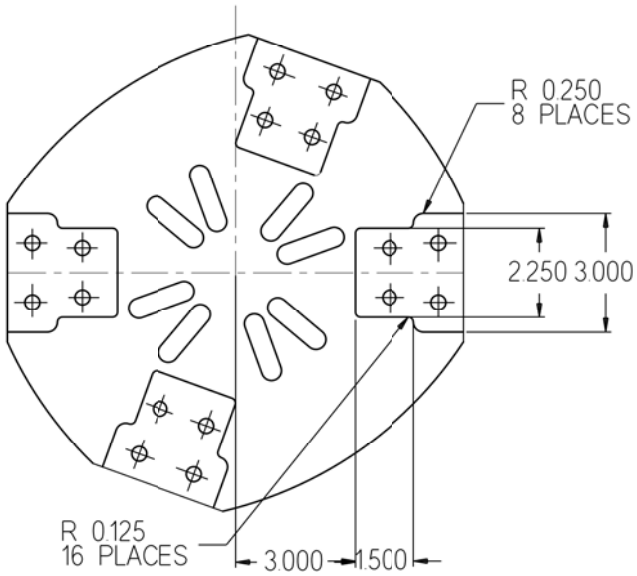
CAM Competition Post Secondary	
Title:	Drone Leg Frame
Drawn By:	ML
Date: May 2, 2020	SHEET: 1 OF 3

ALL DIMENSIONS IN INCHES

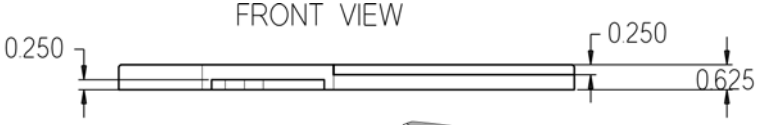
TOP VIEW



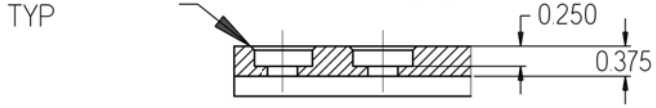
BACK VIEW

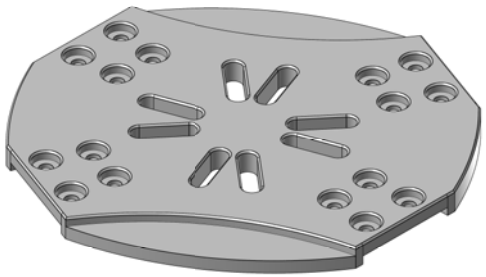


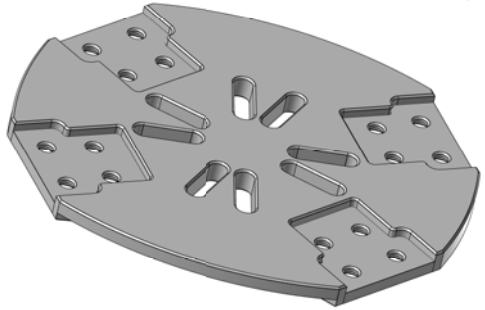
FRONT VIEW



SECTION A - A
SCALE (2:1)



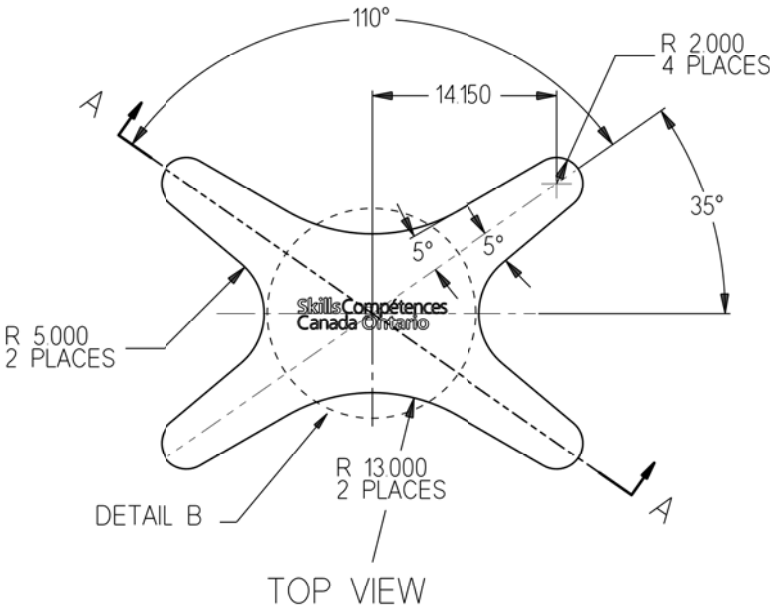




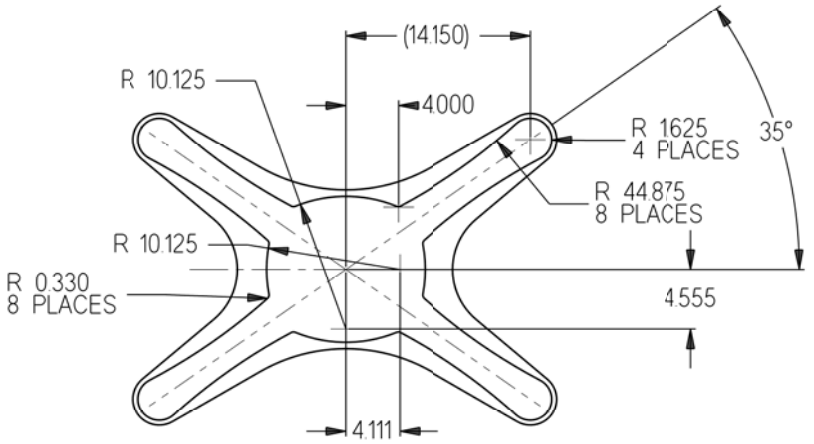
BREAK ALL UNSPECIFIED EDGES AT THE TOP OF THE PART WITH A 0.05 X 45° CHAMFER

CAM Competition Post Secondary	
Title: DRONE TOP FRAME	
Drawn By: ML	
Date: May 2, 2020	SHEET: 2 OF 3

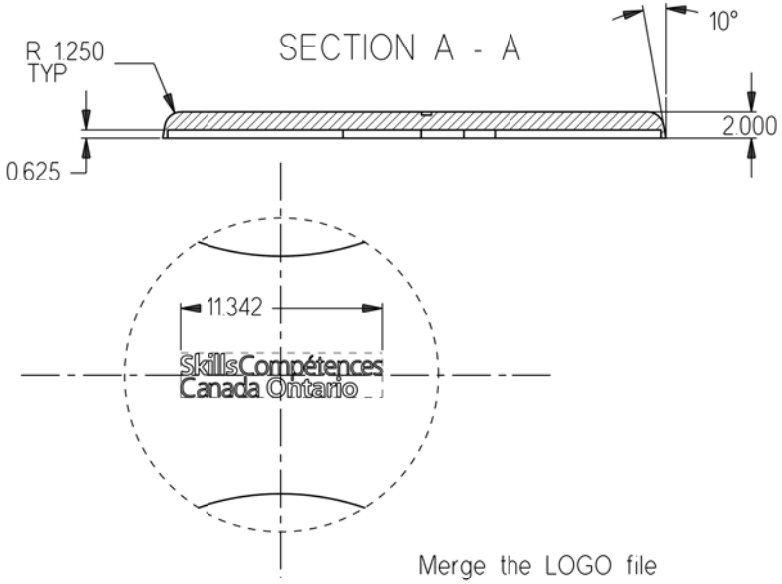
ALL DIMENSIONS IN INCHES



TOP VIEW



BOTTOM VIEW



DETAIL B
(SCALE 1.5:1)

Merge the LOGO file
Scale to size according to the drawing
Machine the Skills and Ontario words as pockets at 0.125 depth
Engrave the rest of the words at 0.05 depth

CAM Competition Post Secondary	
Title: DRONE COVER	
Drawn By: ML	
Date: May 2, 2020	SHEET: 3 OF 3