CNC 3-Axis Milling Programmer

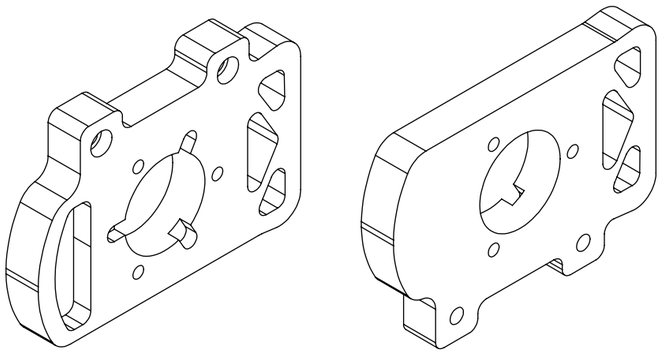
The purpose of this competition is to evaluate each competitor's skills to independently plan and program jobs and to provide instructions for 3-Axis Computer Numerical Control (CNC) milling machine operators to execute. The competition also seeks to recognize outstanding students for excellence and professionalism.

On-Site/Off-Site	• On-Site
Contest Date	• 5/5/2026
Contest Location	• Convention Center • C-Hall
Early/Normal Start Time	• Normal Start Time • Registration will open at 8:00am. Please report to B-Hall Show Office for Registration. • Competition will begin at 10:00am.
Contest Open/Closed	• Open • Exhibit Halls do not open to observers until 12:00pm.
Eligibility & Contest Type	• Please refer to the Program Guidelines for eligibility- **https://www.ohioskillsusa.org/resources/** • Regional Qualifier Contest (Must attend and place in the top 4 at Regionals to Qualify to Compete at State Level)
Clothing	**For Competition Day the Dress Code is:** Class D **For the Awards Ceremony the Dress Code is:** Class A or Class J • SkillsUSA Ohio Clothing Guide
Safety Equipment Required	• N/A
Testing	• Competitor should prepare to take a Validation Cam Programming test, which will require the use of only one of the

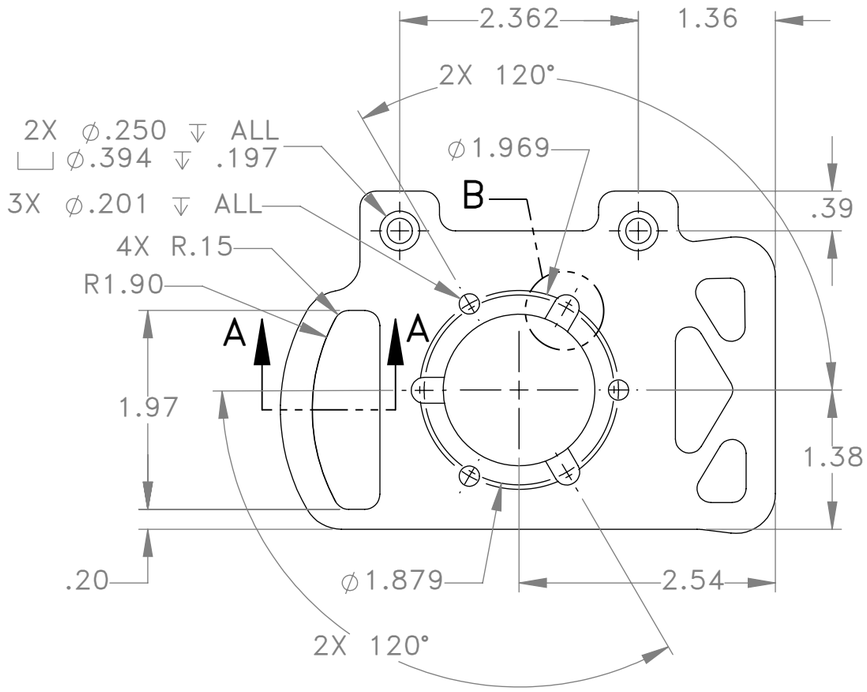
	following approved CAD/CAM software options: Mastercam or Fusion. ● No manual g-coding will be allowed for submission. All programs must be completed using CAD/CAM software. ● Competitor should prepare for a precision measurement test using common precision measurement hand tools, such as, but not limited to, calipers, OD micrometers, and Depth Micrometers. ● The measurement tools and test part will be provided at the competition by the competition coordinators. Competitor will participate in an oral presentation/interview and the submission of a machined part (requirements described in the next section, titled "Provided by Contestant")
Provided by Contestant (Tool List)	● Provided by the Contestant Section Competitor is required to provide their own laptop, PC, and mouse, with working access to Mastercam or Fusion. Free access to Mastercam or Fusion can be provided to the competitor's standalone computer. Please see the Competitor Resource Document for instructions and links to access ● There will be no spare computers available at the event. ● PLEASE TEST THAT THE COMPETITOR'S COMPUTER LOGIN AND ACCESS TO YOUR CAD/CAM SOFTWARE IS WORKING PRIOR TO ARRIVAL. ● Competitor computers need to be able to read and write to a standard USB, A Flash Drive. ● Competitor is required to bring the supporting documentation and machined part from the 2026 Regional 3-Axis Milling competition to be submitted at the State contest. ● Please use the following link to download the engineering drawing and STEP model for the part. ● The part must be produced by the competitor with no outside assistance from the Advisor or anyone else. ● The part material can be made from steel or aluminum. ● The part will be measured for accuracy and scored in the Part ● Submission/Oral Presentation category. ● The competitor must use their judgement to select the best strategy, tooling, and work holding used to machine the part. ● The Competitor is required to digitally fill out and bring a printed copy of the setup sheet. The competitor can use their own setup sheet design or utilize the one provided at the link below. The competitor will be penalized for failing to provide the setup sheet. ● Competitor is required to bring a Pen or pencil for notes or written calculations. Paper will be provided by the competition coordinators. ● Competitor has the option to bring a Basic calculator

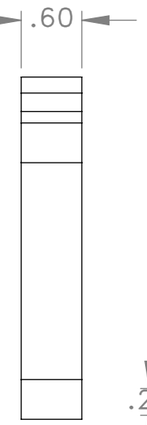
	• All competitors must have a hard copy of a one (1) page personal resume.
Contest Notes, Themes, & Deadlines	• N/A
WIFI Provided?	• No
Special Notes/Rules for All Contests	• Starting in 2024, all Skilled Trade State Contests (most leadership contests already use scenarios) will begin to add a scenario-based component. • **Wi-Fi will NOT BE AVAILABLE unless listed above**. If you need WIFI access, please plan to bring a hotspot. • All safety requirements will be heavily enforced. Competitors are to follow all safety standards and OSHA Regulations. ***Contestants MUST HAVE A COPY OF THEIR EMERGENCY MEDICAL FORM IN THEIR NAME BADGE AT ALL TIMES*** **THE FOLLOWING ITEMS ARE PROHIBITED; VIOLATION OF ANY OF THE FOLLOWING MAY RESULT IN COMPETITOR DISQUALIFICATION:** • Contact with Contest Coordinators is prohibited. • Contact with Contest Coordinators outside of the SkillsUSA Ohio is strictly prohibited. • Possession of smart watches and/or phones during the contest and/or in contest. • Contact with anyone outside of the contest area once the contest begins. • Inappropriate communication between contestants such as verbally degrading another contest. • Cheating on any portion of the contest such as informing another contestant of the skills/test prior to competing. • Lack of Copy Emergency Medical Form in Name Badge.
National Technical Standards	• Please refer to the **2024-2026 National Technical Standards** for all contests. All standards included may be tested in any competition. • In conjunction with National Standards, lack of understanding of State Level competition standards (this document) may result in student loss of contest.
Resume/Interview Requirement	• All SkillsUSA Ohio State Championship Contests will require a short interview component. Students should be prepared with basic job interview skills. • All contestants **must have a hard copy** of a one (1) page personal resume.

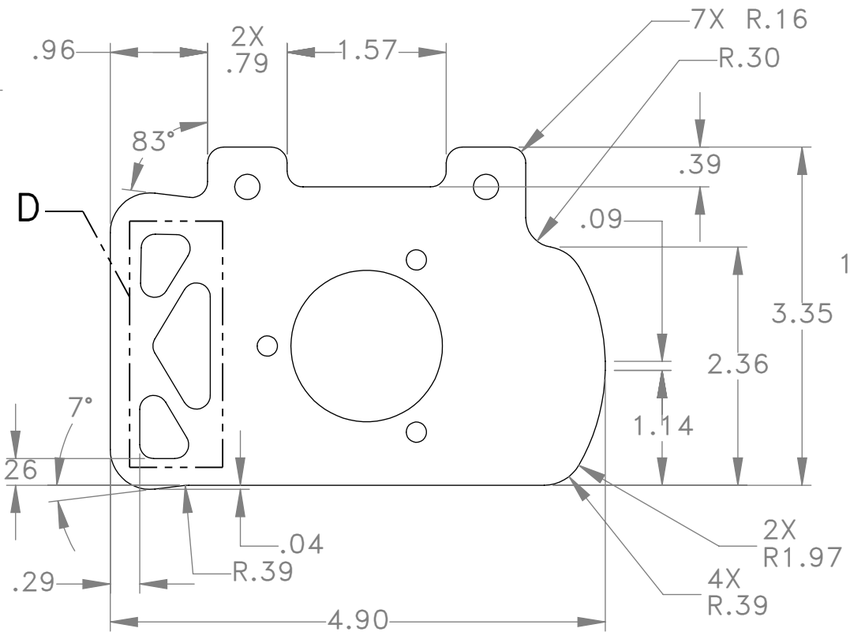
REVISION DESCRIPTION	ZONE
REMOVED 4X R.15 RADII; ADDED 1.14, .09 DIMS	B2 M4,M6

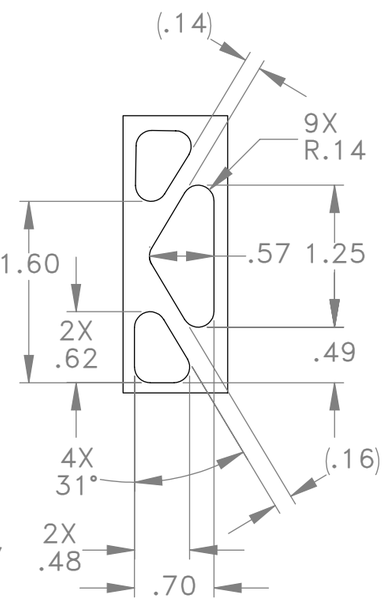


ISOMETRIC VIEWS

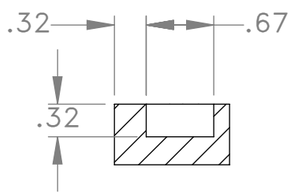




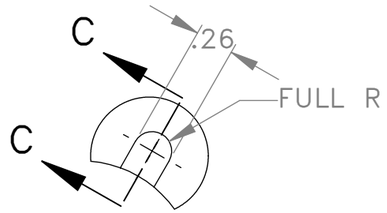




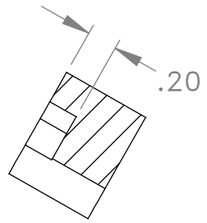
DETAIL D
SCALE 3 : 4



SECTION A–A



3X DETAIL B
SCALE 1 : 1



SECTION C–C
SCALE 1 : 1

DIMS IN INCHES BREAK EDGES 0.015
LATHE FINISH 63 uINCH MILL FINISH 125 uINCH
90° CSINK TAPPED HOLES 0.016R OVER MAJOR⌀
TOLERANCES– UNLESS OTHERWISE SPECIFIED
X/X ±0.06 X.X ±0.06 X.XX ±0.02 X.XXX ±0.005
ANGLES ±1° X.XXX DIAMETERS Ⓜ 0.005 TIR
X.XXXDIA & SURFACES // & ⏥ 0.001 INCH/INCH

HAAS AUTOMATION, INC.

ENTRY LEVEL MILL

MATERIAL	FINISH	SIZE	SCALE	DWG	REV
ALUMINUM	NONE	B	2:3	REGIONAL 3X MILLING 2026	A

CNC PROGRAMMING COMPETITOR RESOURCES

Haas Automation, Mastercam, Autodesk, and Zeiss sponsor the SkillsUSA CNC Machining competitions. A Technical Committee comprised of individuals from these companies is committed to providing materials for Regional and State competitions throughout the United States for the 2026 CNC Machining competitions. These materials are intended to help states run their Regional and State CNC competitions.

In addition, we are providing a list of resources to help prepare students to enter CNC Machining competitions and our industry's workforce, feeling well-equipped for success. Please see the following pages for resources.

For state-specific competition updates and other questions related to your state or local event, visit your SkillsUSA association website or reach out directly to your association director.

About the Competition:

The CNC competitions are comprised of 4 separate skills that the student can test in:

1. CNC 3-Axis Milling (regional and state competitions)
2. CNC 2- Axis Turning (regional and state competitions)
3. CNC Milling Programmer (regional and state competitions)
4. CNC 5-Axis Milling Programmer (State level only)

These Competitions test two major skills areas:

(1) CNC theory test
(2) CAM programming

CNC Theory Test:

The CNC theory test is a set of multiple-choice questions closely related to the competition's CNC subject area of focus, i.e., milling or turning. Competitors must select the best answer that applies, reading each question carefully before choosing an answer.

Programming:

The programming portion of the competition will provide competitors with access to a part drawing, a part STEP model, and a Datasheet. The drawing will be complete with multiple views, making it easy for competitors to visualize the part and understand its geometry. It is the competitor's job to use the documents provided to complete a CAM program. If the part was to run in a machine, the program would produce a machined part that is collision-free in accordance with the Data Sheet and accurate to the part drawing provided. The Datasheet will provide general setup instructions and tool data. Contestants **must** use the tool data provided on the Data Sheet. Contestants will submit their CAM file (NOT NC Code) to the judges. Contestant numbers must be used as the naming convention for the saved CAM file. If this step is missed, the competitor will be penalized. Remember, save early, save often.

Competitors will be provided with all testing documents mentioned above, but **competitors must provide the following items to compete successfully.**

(1) (Required) Laptop or PC with access to CAM software (Mastercam or Autodesk Fusion)
(2) (Required) Pen or pencil for notes or written calculations
(3) (Optional) Basic calculator
(4) (Optional) Machinist Handbook

Recommended Competitor Preparation

Set yourself up for success by committing to continuous learning. Haas Automation and other supporting partners offer an array of opportunities for everyone to learn about the principles of CNC machining. Get ahead by preparing yourself as a competitor before and after competitions.

Haas Certification Program

These online courses are designed to provide the basic knowledge necessary to get started as a CNC machine operator or CNC machinist. They introduce basic CNC machine operation, proper machine safety, and fundamental machining processes. For more information and to sign up for the free online courses, visit: https://www.learn.haascnc.com

Haas Programming Workbooks

These programming workbooks provide the basic principles to program Haas Mills and Haas Lathes. Numerous exercises throughout the workbook enable users to build their skills at their own pace. Answer Books are also available. To download, visit the Haas Learning Resources webpage: https://www.haascnc.com/myhaas/Haas_Learning_Resources.htm

Haas Video Library

The Haas Video Library gives you access to thousands of videos recorded specifically to help Haas CNC users everywhere grow their skills and understanding of CNC machining to maximize their abilities. Access videos directly from the Haas Video Library via the Haas YouTube channel or using the Quick Picklist of the Haas Learning Resources page, which organizes a handful of entry- to advanced-level videos to help get you started. For the complete Video Library, visit: https://www.haascnc.com/video.html Or, for the shortened Quick Picklist, visit: https://www.haascnc.com/myhaas/Haas_Learning_Resources.html

CAM Programming Training and Software

Partners Mastercam and Autodesk Fusion provide access to software and video training programs. Please visit the links below for information on accessing software and training resources.

Mastercam Learning Content: https://my.mastercam.com/hubs/learning/
Sign up for a myMastercam account to access courses in Core, 2D Mill, 3D Mill, Lathe, Multiaxis, and more. Please be sure to use a .EDU or .ORG email address to gain full access to courses.
FREE Acoustic Amplifier Project-Based Tutorial: https://signup.mastercam.com/project-part-series-1-amplifier
FREE SkillsUSA Milling Prep Lesson from camInstructor: Sign Up Here
FREE Mastercam Software Access for SkillsUSA: https://www.mastercam.com/skillsusa/
Contact Email: education@mastercam.com

Autodesk and SkillsUSA:
Information on how Autodesk supported SkillsUSA Manufacturing competitions last year (to be updated ahead of NLSC).
https://www.autodesk.com/campaigns/education/skillsusa

Download Autodesk Fusion:
Autodesk Fusion is an all-in-one integrated CAD/CAM/CAE software that is **free for students and educators**. Available on Mac, PC, and Chromebook.
https://www.autodesk.com/campaigns/education/fusion-360

Autodesk Fusion Learning Resources:
Extend your skills with our free courses, featuring self-paced courses, tutorials, and learning modules.
https://www.autodesk.com/certification/learn/catalog/product/Fusion%20360

Autodesk Professional Development:
Deepen or onboard to Fusion as an educator by taking our Fusion Fundamentals course (12-hour CAD course and 6-hour CAM course).
https://www.autodesk.com/campaigns/education/fusion-fundamentals

If you have questions or would like additional support, please contact ben.brasch@autodesk.com.

SkillsUSA 2026 Regional Datasheet

Part Name:	DRW:	Rev:	Competitor Number:	Date:

Program #	
Operation:	
WCS:	
WCS Location:	
Work Holding	
Stock	
Part location:	
Setup Notes:	

Tooling:

Tool #	Tool Type	Diameter	# of Flutes	Flute Length	Stickout	Holder Type	Starting Chip Load	Max SFM

Student notes:

Judge notes:

SkillsUSA 2026 Regional Datasheet

Part Name:	DRW:	Rev:	Competitor Number:	Date:

Program #	
Operation:	
WCS:	
WCS Location:	
Work Holding	
Stock	
Part location:	
Setup Notes:	

Tooling:

Tool #	Tool Type	Diameter	# of Flutes	Flute Length	Stickout	Holder Type	Starting Chip Load	Max SFM

Student notes:

Judge notes: