

The following items are required to compete in Automated Manufacturing Technology

1. Intelitek's Benchmill 6000 series CNC milling machines. **Please verify your machine uses 120 volt 20 amp electrical service.** We will not have 230 volt service available.
2. Each team needs a licensed version of CAD/CAM software (Mastercam, Intelitek CNCMotion Virtual Software, or equivalent).
3. Each team will need to provide the following tools:
 - 6" dial or digital caliper.
 - Dial indicator (i.e. . Starrett Last Word Dial Test Indicator must have 3/8" holding shank).
 - 6" or 12" steel rule.
 - Soft face hammer.
 - Safety Glasses.
 - Set of parallels for their vice.
 - 3/8" Shank edge finder.
 - one-1/4" end mill.
 - one-3/8" end mill.
 - one-3/8" twist drill.
 - one-1/4" drill.

Note: Additional cutters would be good to have on hand in the event you break or damage one.

Air hose at least 20' long to connect Intelitek CNC to 1/4" NPT.
4. Tool holders for 1/4" end mill, 3/8" end mill, 3/8" drill, and 1/4" drill.
5. Each team must have a machinist handbook.
6. Each team must provide Pencil / Pen.
7. Each team must provide Calculator.
8. Each team must provide hold-downs or clamps for mounting the vice to the machine.
9. Each team must provide a 3-ring binder.
10. Each team must provide USB Memory Device (thumb drive) for file transfer from programming computer to CNC machine.

11. Each team must provide a machine vise capable of clamping material at least 1" x 2" x 4".
12. Teams must consist of 3 members- each member takes the lead on CAD/drafting, CAM programming, and CNC machining. Other team members can and should help, but **each** team member must establish themselves as the lead of one area.
13. The part will be machined in a prototype material Renshape 472, provided by the contest coordinator.
14. Each team must provide Two computers:
 - One computer loaded with CAD software for CAD program. Solidworks, Inventor, or equivalent.
 - One computer loaded with software for CAM program. The SkillsUSA manual states this computer **MUST** have an open LAN port (Ethernet connection). If the cam program is transferred to the machine with a jump drive, this isn't important.

Contest Coordinator will supply the following items for Automated Manufacturing Technology

1. Copies of Process plan, Fixturing description, and Quality Assurance form, to be filled out during the competition and put in your 3-ring binder. You are encouraged to review these sheets ahead of time, so you are familiar with them. Planning and control are as critical to success as the actual machining.
2. Renshape 472 will be provided for each team. The Renshape will be saw cut oversize to the finish dimensions.

Schedule

Thursday afternoon

Unload and set up. Heartland Events Center (HEC) has a forklift available to unload and transport your CNC to the competition area. Please allow extra time for the unloading of your CNC machine. I'm sure the forklift operator will be very busy trying to accommodate everyone. I hope to have a contact and detailed unload plan a week before the competition.

Once you have your machine unloaded I recommend you plug it in, set it up, and test it, to make sure you are ready to go on Friday morning. There won't be any time on Friday morning to work through set up issues.

Check the schedule for the Opening ceremony start time. Plan to be unloaded prior to the opening ceremony.

Friday

8am- we will have a short meeting to review the part you will be building, and go over the general expectations and schedule for the day. You will meet the judges and have an opportunity to ask questions. The competition will start as soon as this meeting is over.

Noon- We will break for lunch and will stop the competition for 30 minutes, you are welcome to take a longer lunch, but you won't be allowed any additional time.

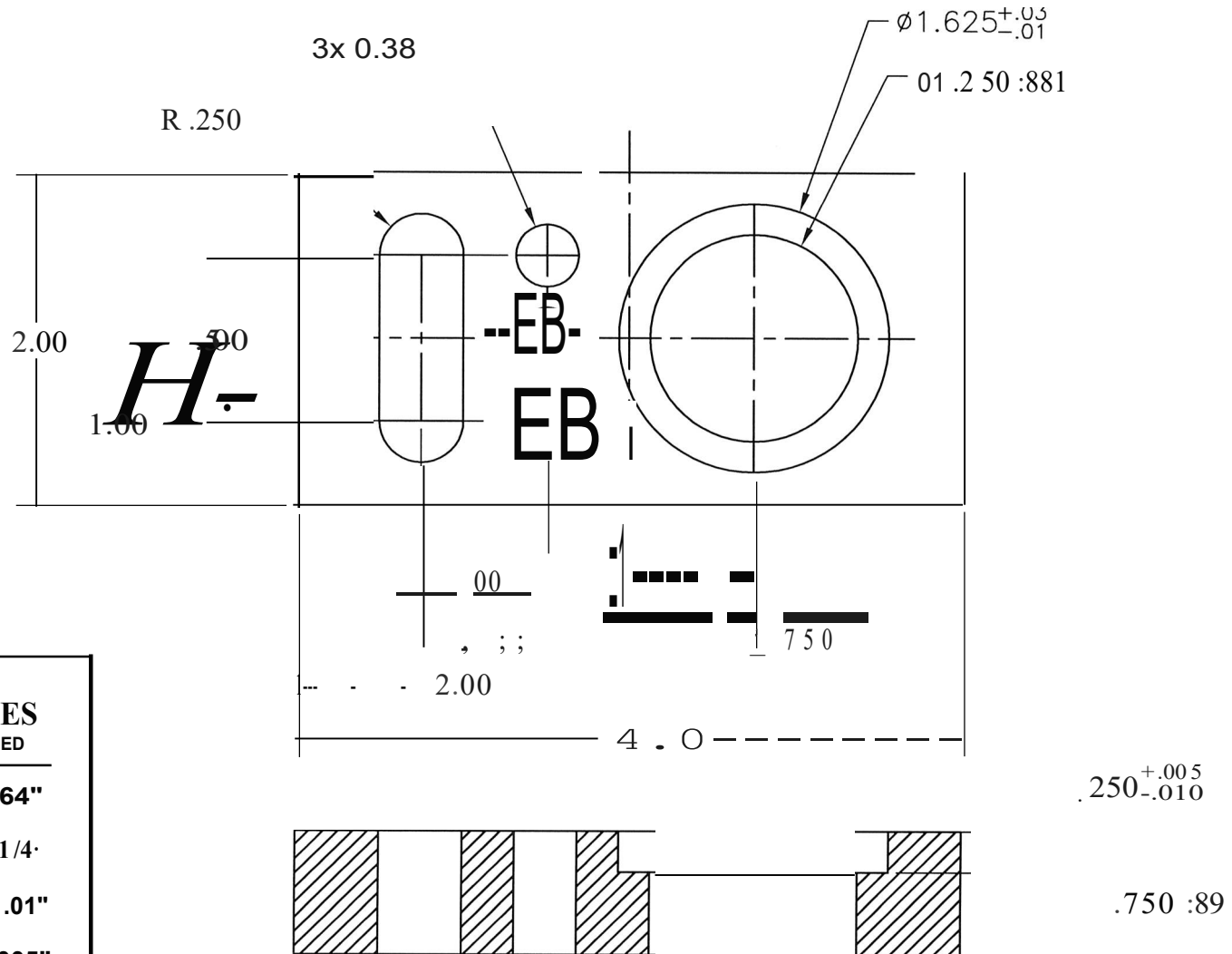
4pm- The competition will end at 4:00. If you are not completely finished at 4:00, you will be judged on the work you have completed.

There will be an additional Revision of the part for teams that choose to do it. Information for the Revision will be supplied to each Team after the original part has been completed.

Attached you will find the Score card, Process Plan, fixturing description, and Quality Assurance forms for your review, and to prepare for the competition.

Item Name	Description	Points available	Score
Safety	Team works in a safe manner. This includes keeping the area tidy, wearing safety glasses with side shields, and ear protection as needed	50	
Housekeeping	Housekeeping includes staying organized during the process and clean up after the contest is done	50	
Clothing	SkillsUSA manual calls for Khaki pants and work shirt with black or brown leather shoes. We will also expect skill s USA shirts and professional looking jeans (no rips or holes). Tennis shoes are ok so long as they look Professional.	50	
Fixturing Description	Fixturing description will be graded on completion and accuracy to the actual fixturing used	50	
Quality Assurance Form	Quality assurance form will be graded on completion and accuracy to the actual part, and the team's ability to measure and record actual dimensions	50	
Engineering Process Plan	This will be graded on your ability to complete the Process Plan	75	
Concurrent Engineering Process Plan	This will be graded on your ability to complete the requested engineering change after the original part is complete	75	
CAD/ drafting	This will be a single grade based on the lead CAD persons ability to construct the part in 3D model form, and complete the part print including title block and border	100	
CAM programming	The grade will be based on the lead CAM persons ability to write the program and prepare the Process plan sheet	150	
CNC machining	The grade will be based on the lead CNC operators ability to load the CAM program, set up the machine, and cut the part. The CNC operator will also fill out the Fixturing description	100	
Total		750	

Practice po rt



**STANDARD
PRINT TOLERANCES
UNLESS OTHERWISE SPECIFIED**

FRACTIONS	=	$\pm 1/64''$
ANGLES	=	$\pm 1/4^\circ$
.XX	=	$\pm .01''$
.XXX	=	$\pm .005''$
.XXXX	=	$\pm .0005''$

AUTOMATED MANUFACTURING TECHNOLOGY

CONCURRENT ENGINEERING PROCESS PLAN

TEAM NUMBER _____ CUSTOMER _____

COMPLETED BY _____

DATE _____ PART NUMBER _____

PART NAME _____

PART NUMBER _____ MATERIAL _____

BLANK SIZE _____ CNC MACHINE _____

R _____

ri	l ti p ri b	l	n_ ' ' ' tion	-S die E -1	lic:ed R.aite	l'li.mge R,Ht

Possible Pts. 75

_____ Team # _____

AUTOMATED MANUFACTURING TECHNOLOGY

QUALITY ASSURANCE FORM

TEAM NUMBER _____ STUDENT NAME _____

COMPLETED BY _____

DATE _____ PART NUMBER _____

PART NAME _____

PART NUMBER _____ CNC MACHINE _____

BLANK SIZE _____ MATERIAL _____

Object #	Object Description	Defined Tolerance	Dimension Margin	
			High	Low

DATE _____ QA picture

NOTES _____

Signature _____

Signature

Signature _____

PQ/SS 1 Pt.: _____

T _____
T _____

AUTOMATED MANUFACTURING TECHNOLOGY

FIXTURING DESCRIPTION

TEAM NUMBER _____ CUSTOMER _____

RAWN BY _____

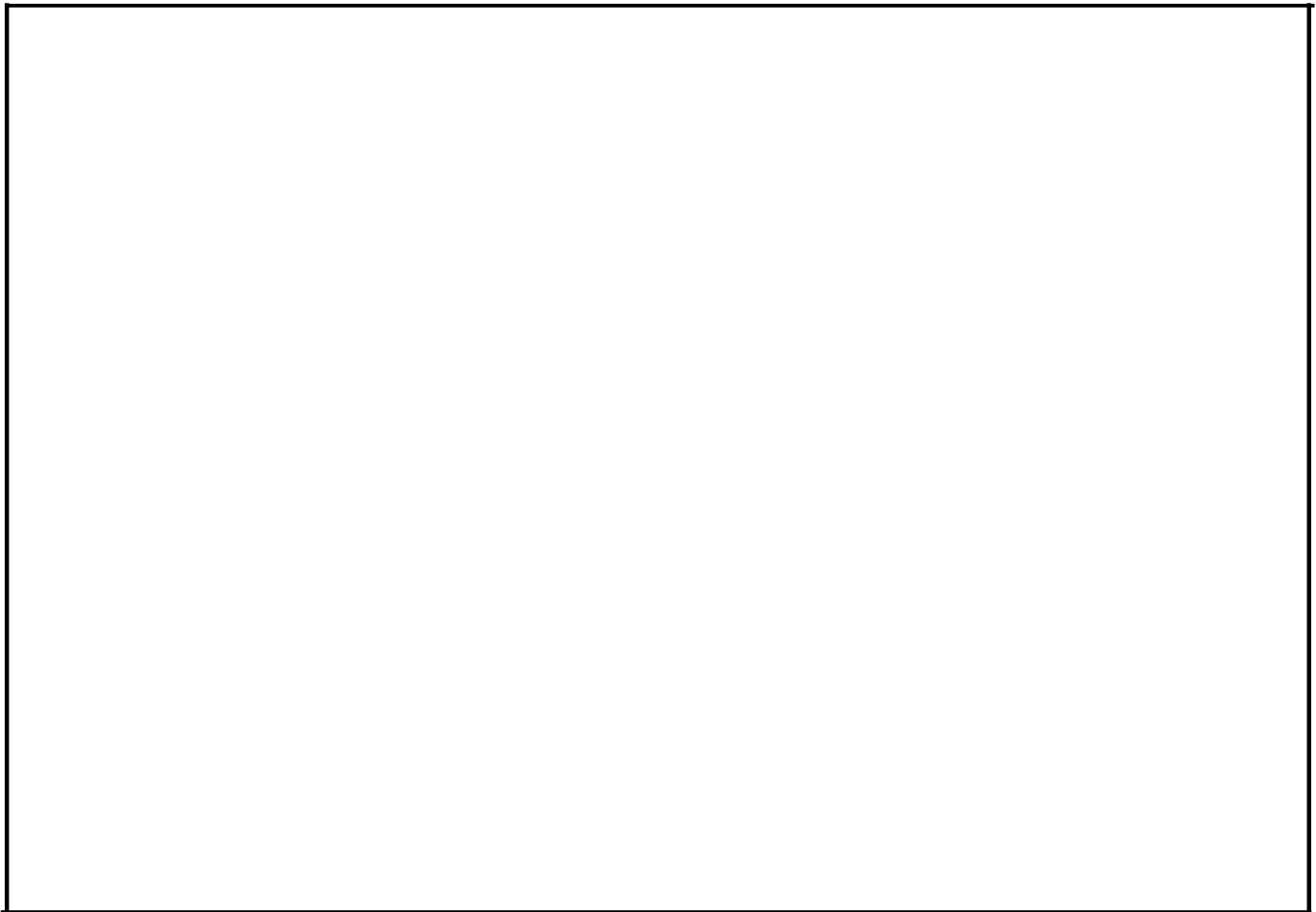
DATE _____

PART DUE DATE _____

PART NUMBER _____

PROJECT NUMBER _____

SKETCH OF FIXTURE WITH TOUCH-OFF INDICATOR



Possible Pts. 80

Time _____

Team _____

AUTO - TE D M A N U F - C T U R I G T E C H N O L O G Y

P R O C E S S P L A N

TEAM NUMBER _____ **CUSTOMER** _____
D O.M.P. **D** B.Y. _____ **P** A.R. **D** U.E.D. **T** _____

PART _____ **NAME** _____
 PART _____

PART NUMBER _____ **CNC MACHINE** _____
BLANK SIZE _____ **MATERIAL** _____

No	Description	I	Operation	Sottd	Feed R:uc	" Rab:

Possible Pts. 100

15in1.M _____

