

Question:

If students copy the g-code they created for the initials project can they simply paste that g-code into the Tormach and run it without having to edit the g-code?

Answer:

The Tormach machines need a little more code (closer to what industry uses) than what is taught in the PLTW curriculum. What they have already created will work once some additional setup code is added.

Helpful Link: <https://tormach.atlassian.net/wiki/spaces/XST/overview>

Helpful background knowledge

Some of the codes you need to add are for error coding, or canceling modes (if you have never called a mode to come on, then they are already canceled). There is probably some of the code that is not necessary like the G30 (return to home). These are from the code Inventor CAM spits out and is what I am going with.... I do remove the Coolant on and off M8 / M9.

The biggest one is G54 - The position at the machine where you will save/store the origin of the part (there are others as well; G55, G56, G57.....)

I guess the other big one is the H code that goes with the Tool change. That is where the tools length is stored. Usually the Tools number and offset match like this: T5 H5, T12 H12

Others that are important

G17 sets the X and Y plane as the top surface

G94 how to interpret you feed rate values

G91.1, G90.1 Sets the arc mode (how the center point is defined)

G43 apply tool length offset (H number)

Below is an example of additional coding they may need to be added to get your code to work with the xsTech Router

%

(1001)

G90 G54 G64 G50 G17 G40 G80 G94 G91.1 G49

G20

G30

T5 G43 H5 M6

S3000 M3

G54

M5

G30

M30



Below are explanations of the additional coding that may be need to be added to get your code to work with the xsTech Router

Setup Code	
Code	Remarks for what the codes do
% (1001) G90 G54 G64 G50 G17 G40 G80 G94 G91.1 G49	(Use parentheses instead of semicolon for comments) (Percent Sign Start of Program) (Program Identifier/Name) add any name you want here (G90-Absolute) (G54 Select Work Offset Coordinate System/Part Origin Saved at Machine) (G64 Set Blended Path Control Mode) (G50 Limits Maximum Spindle Speed) (G17 Define X Y Plane) (G40 Cutter Compensation Off) (G80 Cancel Active Canned Cycle) (G94 Feed Rate Mode - Feed per Minute) (G91.1 Arc Distance Mode – IJK Mode / 91.1=Incremental Mode, 90.1=Absolute Mode) (G49 Cancel Tool Length Compensation)
Main Body	
T5 G43 H5 M6	(T5 Call Tool 5) (G43 Apply Tool Length Offset) (H5 Use Height Offset Stored for Tool 5) (M6 Tool Change)
S3000 M3 G54	(Spindle On CW at 3000 RPM) (G54 Select Work Offset Coordinate System/Part Origin Saved at Machine)
Ending Code	
M5 G30 M30	(M5 Spindle Off) (Return to Secondary Home Position / Causes the mill to move to the a pre-defined G30 position) (Program Stop)



Below is a full example of a pocketed area posted directly from Inventor CAM
for Tormach Pathpilot

% (1001) (T5 D=0.375 CR=0. - ZMIN=-0.25 - flat end mill) G90 G54 G64 G50 G17 G40 G80 G94 G91.1 G49 G20 (Inch) G30 N10(2D Pocket1) T5 G43 H5 M6 (T5 38 End Mill) S3000 M3 M9 G54 G0 X0.946 Y1.0316 G0 Z0.6 G0 Z0.2 G1 Z0.1 F18. G1 Z-0.2125 F9. G1 X0.945 Y1.0308 Z-0.2222 G1 X0.942 Y1.0286 Z-0.2313 G1 X0.9398 Y1.0265 Z-0.2351 G1 X0.9378 Y1.0244 Z-0.239 G1 X0.9354 Y1.0213 Z-0.242 G1 X0.9334 Y1.018 Z-0.245 G1 X0.9314 Y1.0139 Z-0.2468 G1 X0.93 Y1.0096 Z-0.2487 G1 X0.9291 Y1.0048 Z-0.2494 G1 X0.9288 Y1. Z-0.25 G1 Y0.9416 F18. G3 X0.9416 Y0.9288 I0.0128 J0. G1 X2.0584 G3 X2.0712 Y0.9416 I0. J0.0128 G1 Y1.0584 G3 X2.0584 Y1.0712 I-0.0128 J0. G1 X0.9416 G3 X0.9288 Y1.0584 I0. J-0.0128	G1 Y1. G2 X0.8692 Y0.898 I-0.1172 J0. G3 X0.8993 Y0.7838 I0.03 J-0.0532 G1 X2.2035 G3 X2.2162 Y0.7965 I0. J0.0128 G1 Y1.2035 G3 X2.2035 Y1.2162 I-0.0128 J0. G1 X0.7965 G3 X0.7838 Y1.2035 I0. J-0.0128 G1 Y0.7965 G3 X0.7965 Y0.7838 I0.0128 J0. G1 X0.8993 G2 X1.159 Y0.6106 I0. J-0.2813 G3 X1.4187 Y0.4375 I0.2597 J0.1082 G1 X2.25 G3 X2.5625 Y0.75 I0. J0.3125 G1 Y1.25 G3 X2.25 Y1.5625 I-0.3125 J0. G1 X0.75 G3 X0.4375 Y1.25 I0. J-0.3125 G1 Y0.75 G3 X0.75 Y0.4375 I0.3125 J0. G1 X1.4187 G1 X1.4235 Y0.4378 Z-0.2494 G1 X1.4283 Y0.4387 Z-0.2487 G1 X1.4326 Y0.4402 Z-0.2468 G1 X1.4367 Y0.4421 Z-0.245 G1 X1.44 Y0.4441 Z-0.242 G1 X1.443 Y0.4465 Z-0.239 G1 X1.4452 Y0.4485 Z-0.2351 G1 X1.4473 Y0.4507 Z-0.2313 G1 X1.4495 Y0.4537 Z-0.2222 G1 X1.4502 Y0.4547 Z-0.2125 G0 Z0.6 M5 M9 G30 M30 %
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