Mill-Turn 2.0
With Autodesk HSM

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Title

AUTODESK.
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About the speaker

Self-taught machinist

Originates from Europe

Customer Advisory group

Active forum member

Going beyond the capabilities

Section Break

Mill-Turn

WHAT DO WE MEAN BY MILL-TURN

SOFTWARES

HSM Family:

- Fusion 360
- Inventor HSM
- HSMWorks

Turning

SETUP

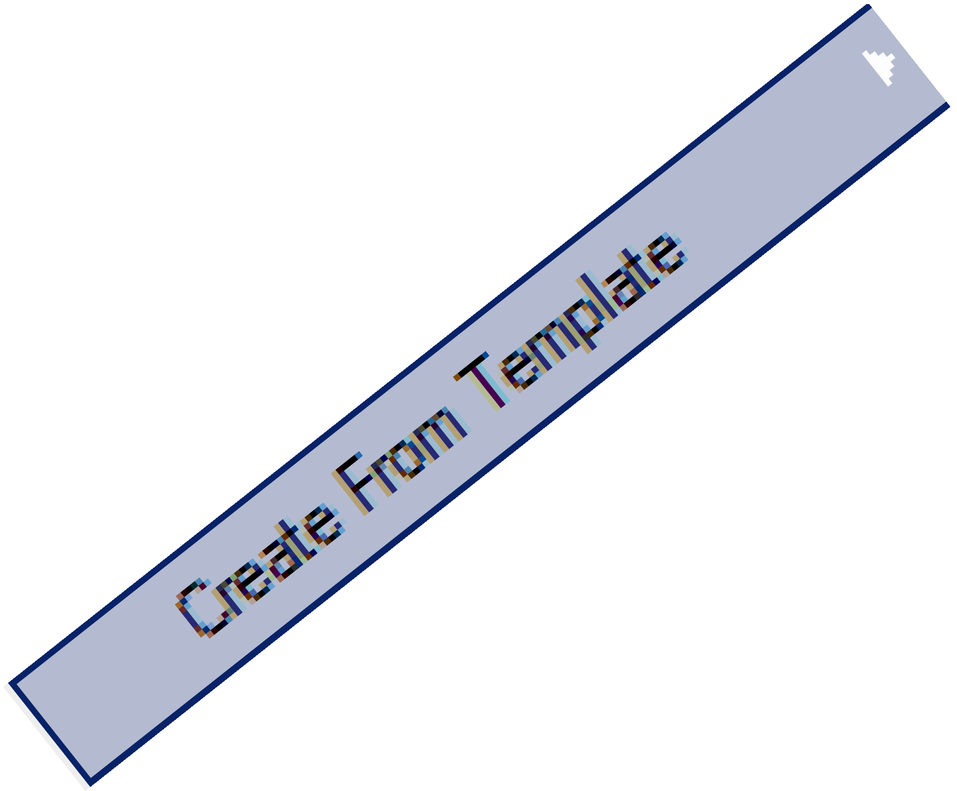
- WCS on rotary-axis
- Spun profile

TEMPLATES

- Templates
- Templates
- Templates

DEVELOPMENT

- Currently in heavy development
- Angelo Juras



DEMO Time

Milling

- Just like a milling machine
- Available for everyone.

- Tool orientation

Milling

<table>
<tr><td></td><td>Axial</td><td>Radial</td></tr>
<tr><td>Live Tools</td><td>Any 2D-3D & Drill</td><td>Slot-2D Contour & Drill</td></tr>
<tr><td>Y-axis</td><td>Any 2D-3D & Drill</td><td>Any 2D-3D & 4-axis & Drill</td></tr>
<tr><td rowspan="2">Multi-task/B-axis</td><td>Any 2D-3D & Drill</td><td>Any 2D-3D & Drill</td></tr>
<tr><td colspan="2">Tilted planes & 5-axis</td></tr>
</table>

DEMO Time

Post processor

SMARTS

- Y-axis/Polar or XZC mode.

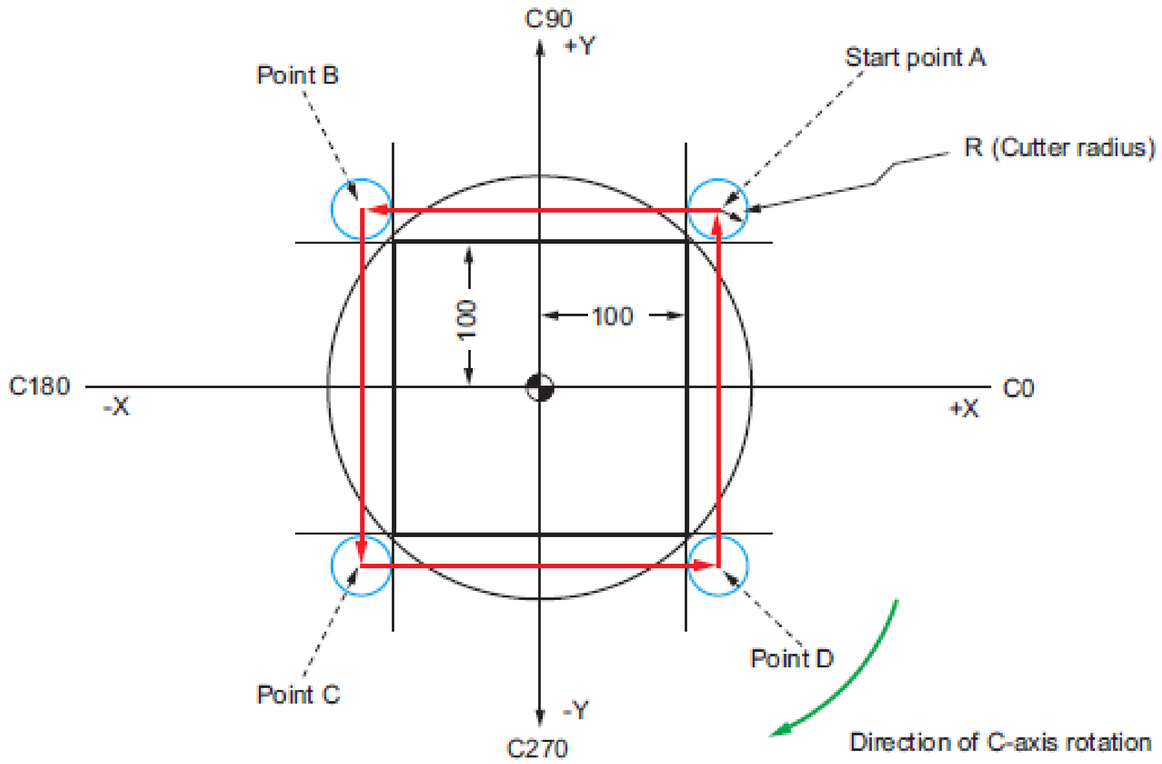
GENERIC

- Haas
- Siemens
- Okuma
- Doosan

SETTING UP YOUR MACHINE

- Y-axis
- Axis limits

XYZ-Polar-XZC



Video Time

Machine Configuration

```
description = "HAAS ST-30Y";

var gotYAxis = true;
var yAxisMinimum = toPreciseUnit(gotYAxis ? -50.8 : 0, MM); // specifies the minimum range for the Y-axis
var yAxisMaximum = toPreciseUnit(gotYAxis ? 50.8 : 0, MM); // specifies the maximum range for the Y-axis
var xAxisMinimum = toPreciseUnit(0, MM); // specifies the maximum range for the X-axis (RADIUS MODE VALUE)
var gotBAxis = false; // B-axis always requires customization to match the machine specific functions for doing rotations
var gotMultiTurret = false; // specifies if the machine has several turrets

var gotSecondarySpindle = false;
var gotDoorControl = false;

// >>>>> INCLUDED FROM ../common/haas lathe.cps
if (!description) {
  description = "HAAS Lathe";
}
vendor = "Haas Automation";
vendorUrl = "https://www.haascnc.com";
legal = "Copyright (C) 2012-2018 by Autodesk, Inc.";
certificationLevel = 2;
minimumRevision = 40783;

if (!longDescription) {
  longDescription = subst("Preconfigured %1 post with support for mill-turn. You can force G112 mode for a specific operation by usi
}

extension = "nc";
programNameIsInteger = true;
setCodePage("ascii");

capabilities = CAPABILITY_MILLING | CAPABILITY_TURNING;
tolerance = spatial(0.002, MM);

minimumChordLength = spatial(0.25, MM);
minimumCircularRadius = spatial(0.01, MM);
maximumCircularRadius = spatial(1000, MM);
minimumCircularSweep = toRad(0.01);
maximumCircularSweep = toRad(120); // reduced sweep due to G112 support
allowHelicalMoves = true;
allowedCircularPlanes = undefined; // allow any circular motion
allowSpiralMoves = false;
highFeedrate = (unit == IN) ? 470 : 12000;


// user-defined properties
```

```
function defineMachine() {
  machineConfiguration.setVendor("Doosan");
  if (properties.machineType == "PUMA") {
    machineConfiguration.setModel("Puma");
    gotYAxis = true;
    yAxisMinimum = toPreciseUnit(-50, MM); // specifies the minimum range for the Y-axis
    yAxisMaximum = toPreciseUnit(50, MM); // specifies the maximum range for the Y-axis
    xAxisMinimum = toPreciseUnit(0, MM); // specifies the maximum range for the X-axis (RADIUS MODE VALUE)
    gotBAxis = false; // B-axis always requires customization to match the machine specific functions for doing rotations
    bAxisIsManual = true; // B-axis is manually set and not programmable
    gotMultiTurret = false; // specifies if the machine has several turrets
    gotPolarInterpolation = true; // specifies if the machine has XY polar interpolation capabilities
    gotSecondarySpindle = true;
    gotDoorControl = false;
    toolFormat = createFormat({decimals:0, width:4, zeropad:true});
    properties.useG400 = false;
  } else if (properties.machineType == "LYNX") {
    machineConfiguration.setModel("Lynx");
    gotYAxis = false;
    yAxisMinimum = toPreciseUnit(0, MM); // specifies the minimum range for the Y-axis
    yAxisMaximum = toPreciseUnit(0, MM); // specifies the maximum range for the Y-axis
    xAxisMinimum = toPreciseUnit(0, MM); // specifies the maximum range for the X-axis (RADIUS MODE VALUE)
    gotBAxis = false; // B-axis always requires customization to match the machine specific functions for doing rotations
    bAxisIsManual = true; // B-axis is manually set and not programmable
    gotMultiTurret = false; // specifies if the machine has several turrets
    gotPolarInterpolation = true; // specifies if the machine has XY polar interpolation capabilities
    gotSecondarySpindle = true;
    gotDoorControl = false;
    toolFormat = createFormat({decimals:0, width:4, zeropad:true});
    properties.useG400 = false;
  } else if (properties.machineType == "PUMA_MX") {
    machineConfiguration.setModel("Puma MX");
    gotYAxis = true;
    yAxisMinimum = toPreciseUnit(-115, MM); // specifies the minimum range for the Y-axis
    yAxisMaximum = toPreciseUnit(115, MM); // specifies the maximum range for the Y-axis
    xAxisMinimum = toPreciseUnit(-125, MM); // specifies the maximum range for the X-axis (RADIUS MODE VALUE)
    gotBAxis = true; // B-axis always requires customization to match the machine specific functions for doing rotations
    bAxisIsManual = false; // B-axis is manually set and not programmable
    gotMultiTurret = false; // specifies if the machine has several turrets
    gotPolarInterpolation = true; // specifies if the machine has XY polar interpolation capabilities
    gotSecondarySpindle = true;
    gotDoorControl = false;
    toolFormat = createFormat({decimals:0, width:5, zeropad:true});
  }
```

DEMO Time

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