
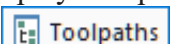


# Mastercam 2020 Chapter 16 Letters & Hole Toolpaths



## A. Stock Setup.

Step 1. If necessary, open your Letters file from Chapter 13.

Step 2. Change to the Isometric View. **Right click** in the graphics window and click  **Isometric (WCS)** (Alt-7).

Step 3. If necessary, display Toolpaths Manager. On the View tab  click  **Toolpaths** (Alt-O).

Step 4. If Machine Group is **not** displayed in the Toolpaths Manager,

**Fig. 1**, on the Machine tab , click Machine  > **Default** from the menu.

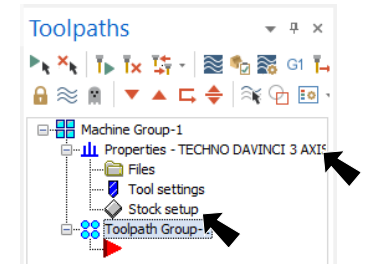


Fig. 1

Step 5. Expand **Properties** (click +) in Toolpaths Manager and click **Stock setup** in Toolpaths Manager, **Fig. 1**.

Step 6. Confirm Stock Plane is **Top**, **Fig. 2**.

Step 7. Confirm **Display** check box is checked.

Step 8. Click **left front top corner** of the stock to move the origin. After you click corner the arrow will point to corner.

Step 9. Click **All Entities** box button in the Stock Setup dialog box,.

Step 10. Set **Z dimension .125**.

Step 11. Click OK  in Machine Group Properties, **Fig. 3**.

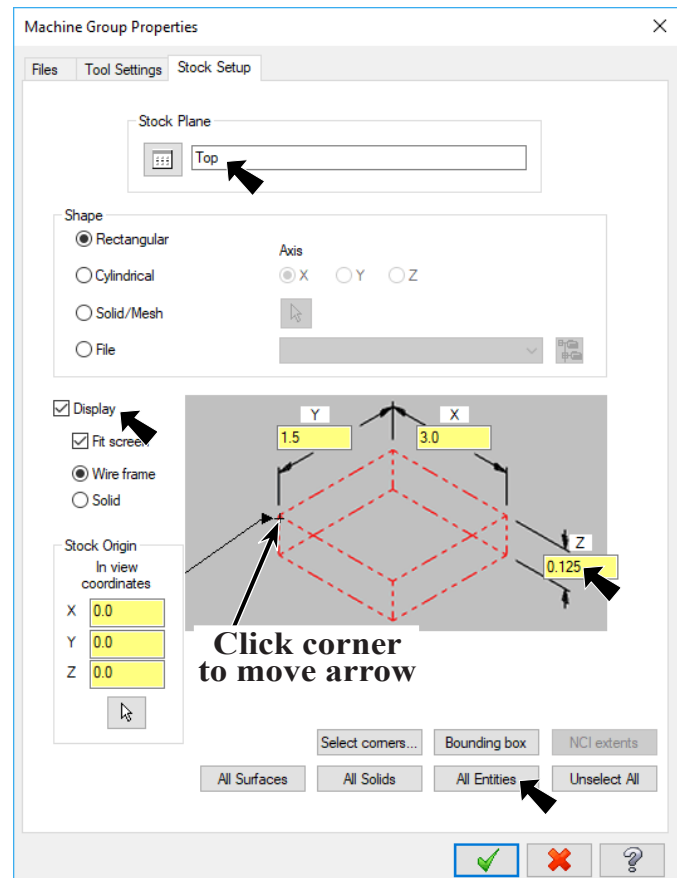


Fig. 2

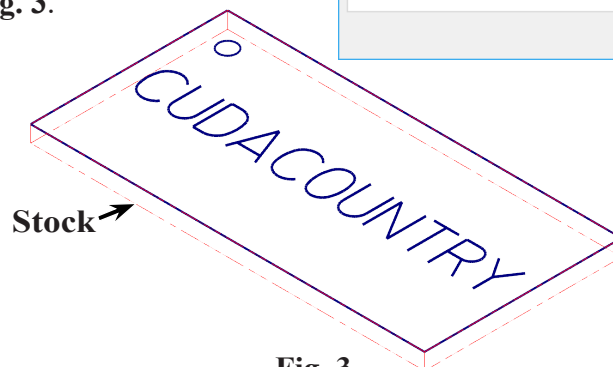


Fig. 3

## B. Contour Toolpath for Letters.

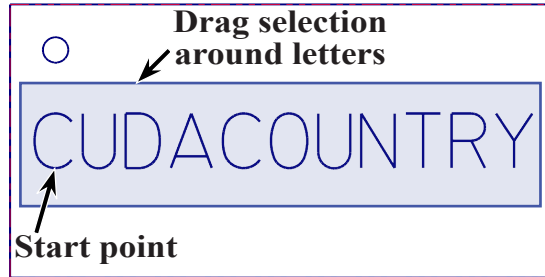
Step 1. Change to the Top View. **Right click** in graphics window and click  **Top (WCS)** (Alt-1).

Step 2. On the Toolpaths tab  in the 2D group click **Contour** .

Step 3. Click **Window**  in Chaining dialog box, **Fig. 4**.

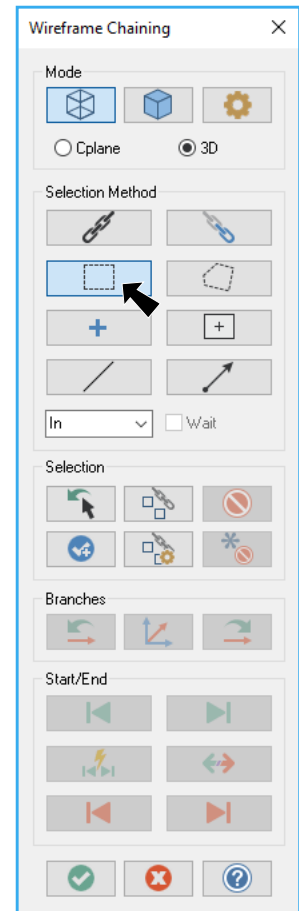
Step 4. Drag a selection around letters, **Fig. 5**.

Step 5. Click **first letter** for **Approximate Start Point**, **Fig. 5**.

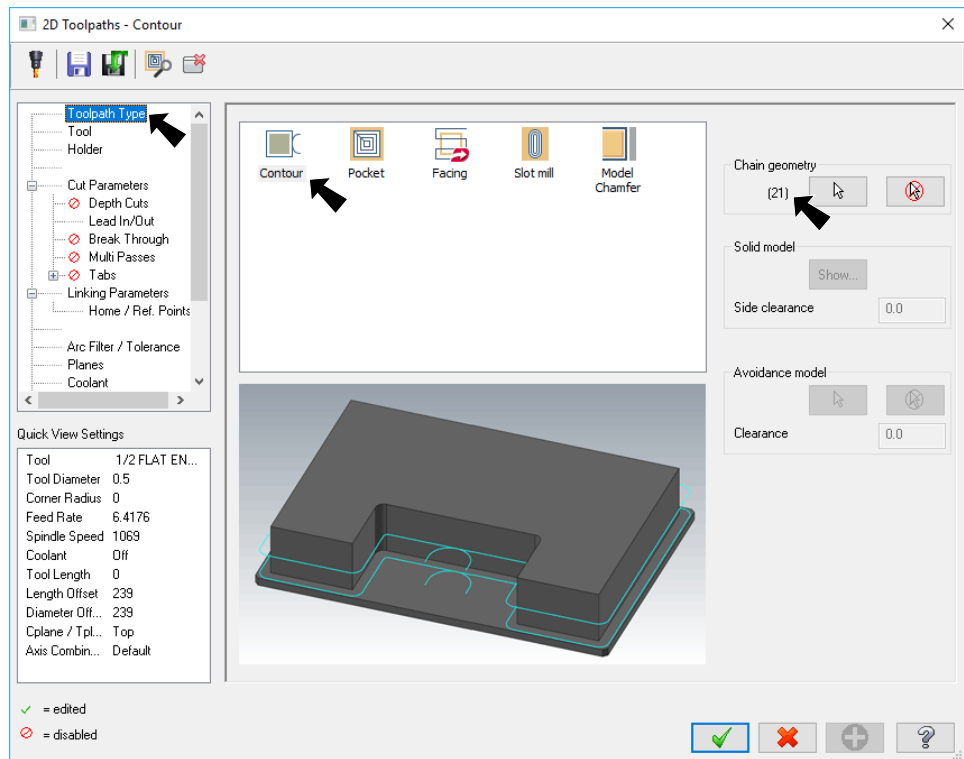


Step 6. Click OK  in Chaining dialog box. **Fig. 5**

Step 7. Select **Toolpath Type** from the tree control and confirm:  
**Contour**  
and  
**Chain geometry 21**  
**Fig. 6**.



**Fig. 4**

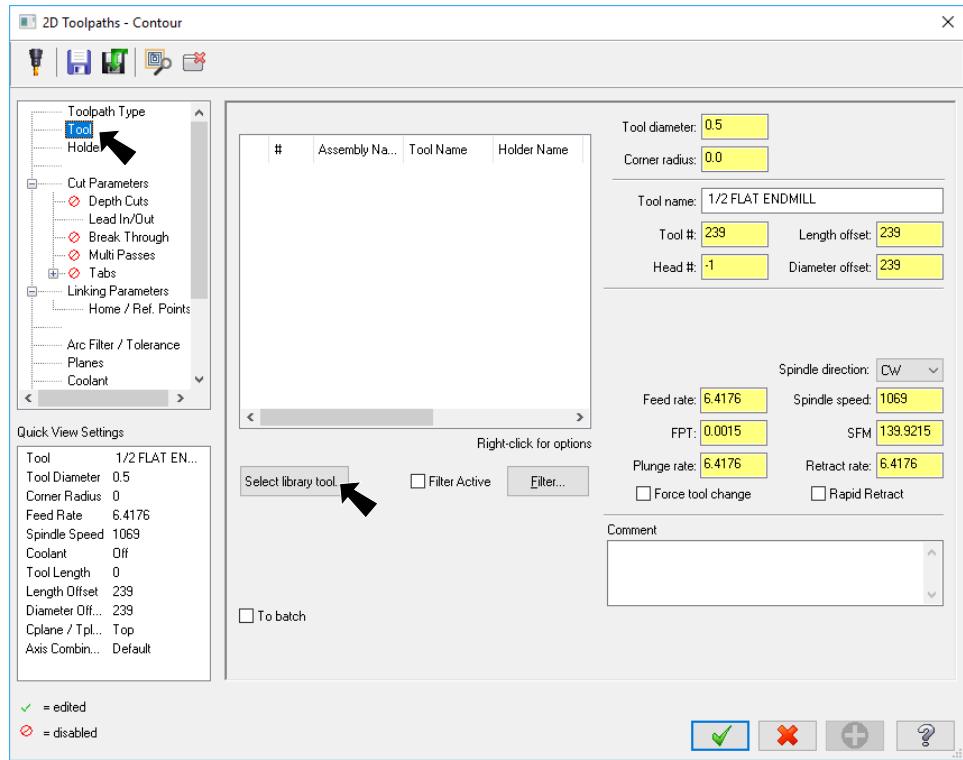


**Fig. 6**

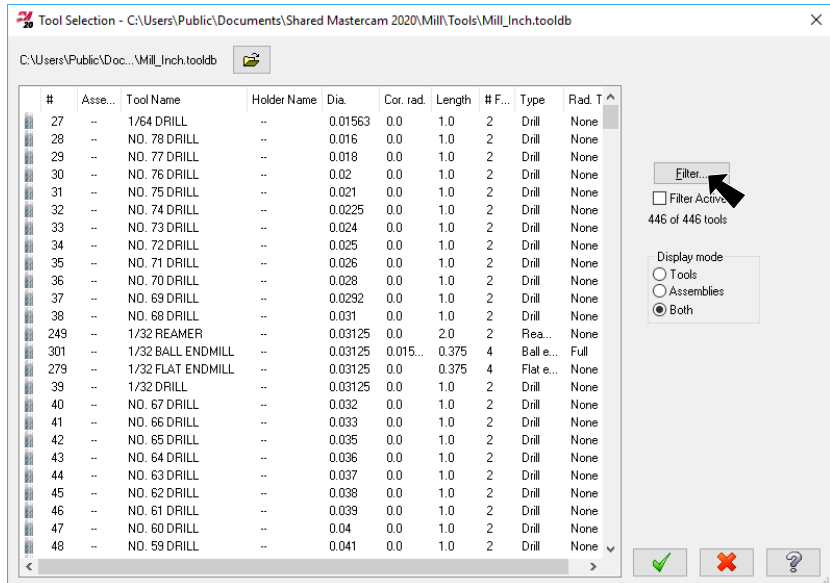
Step 8. Select **Tool** from the tree control and:

Click **Select library tool** button  
**Fig. 7.**

Step 9. Click **Filter** button  
**Fig. 8.**





**Fig. 7**

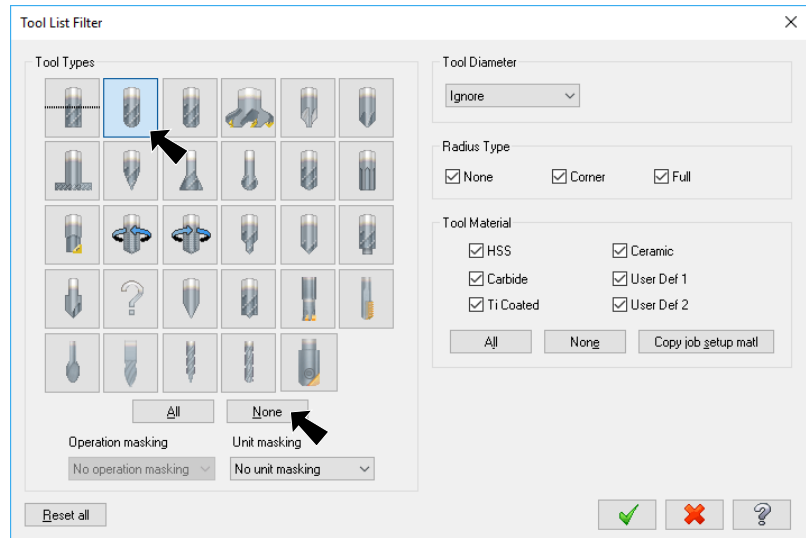


**Fig. 8**

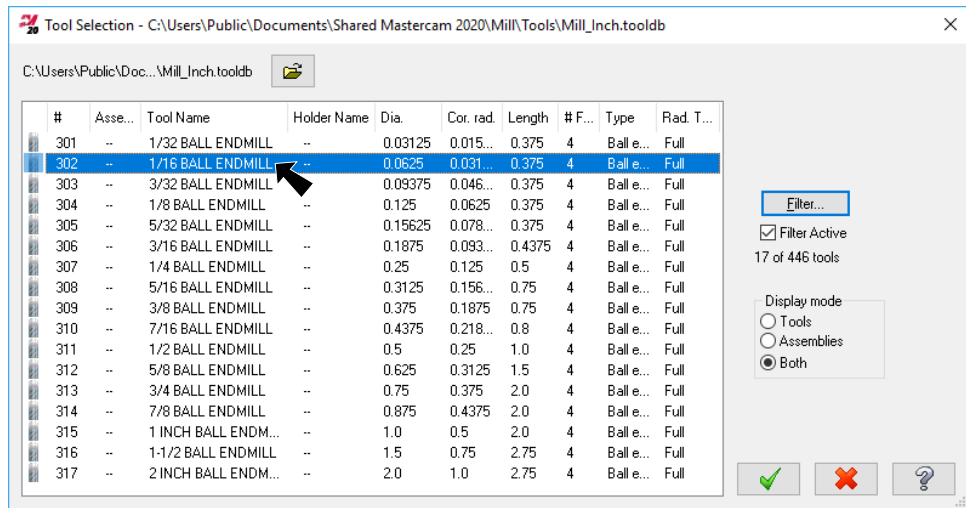
Step 10. Click **None** button under **Tool Types**  
**Fig. 9.**

Step 11. Click **Endmill2 Sphere** button (second button top row) and click OK   
**Fig. 9.**

Step 12. Select **302 1/16 BALL-NOSE ENDMILL** and click OK   
**Fig. 10.**



**Fig. 9**



**Fig. 10**

Step 13. Back in Tool page set:

**Feed rate 15**

**Plunge rate 7**  
**Fig. 11.**

Step 14. Select **Cut Parameters** from tree control and set:

**Compensation type: Off**  
**Fig. 12**

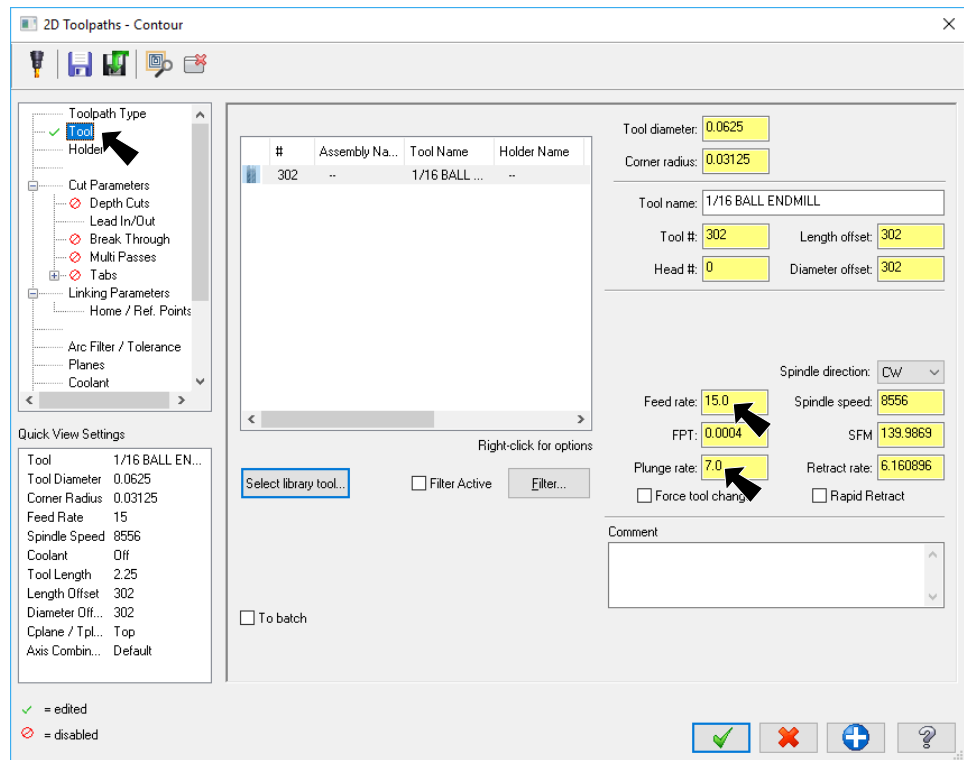


Fig. 11

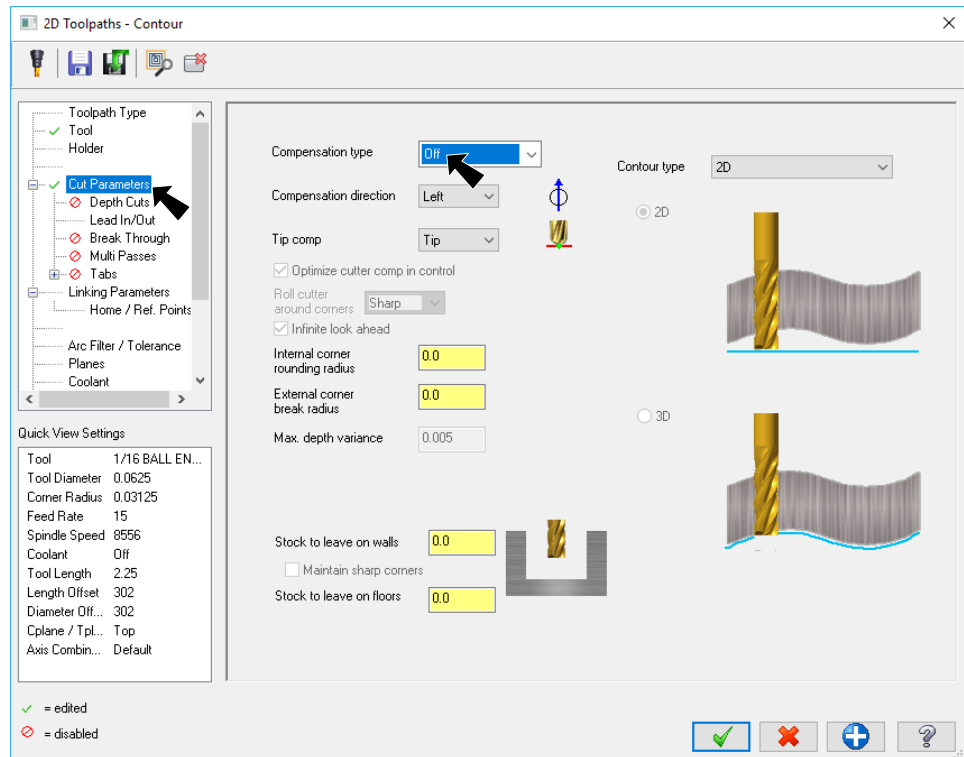


Fig. 12

Step 15. Select **Lead In/Out** from tree control and:

Uncheck **Lead In/Out**  
**Fig. 13.**

Step 16. Select **Linking Parameters** from tree control and set:

Uncheck **Clearance**

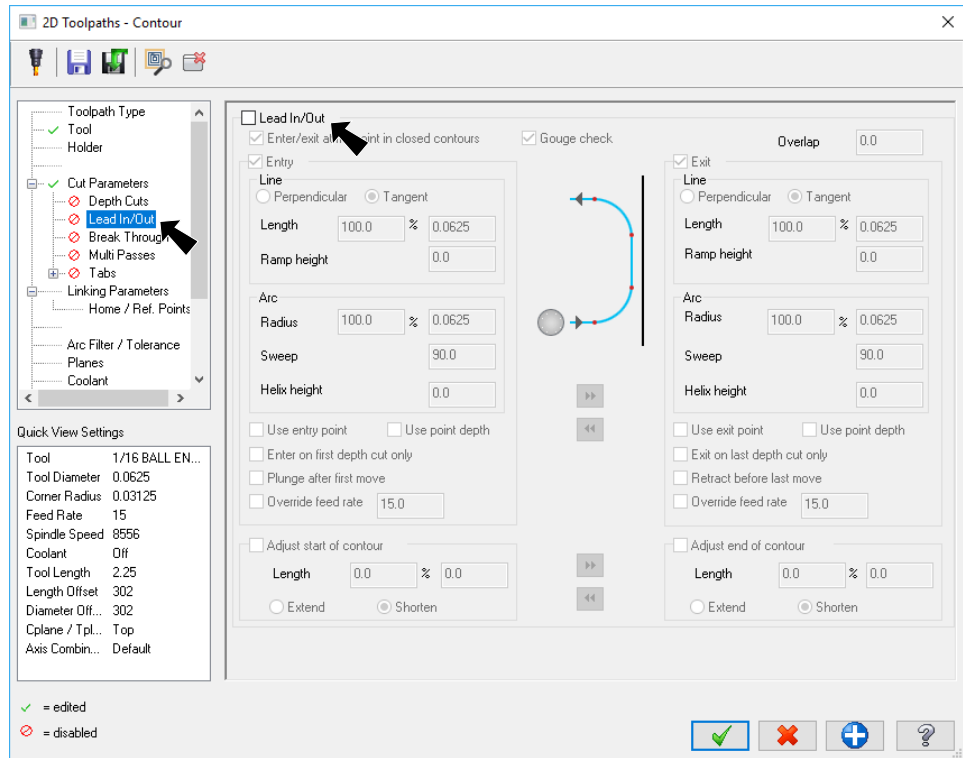
Check **Retract .1 Absolute**

**Depth -.02**  
**Fig. 14.**

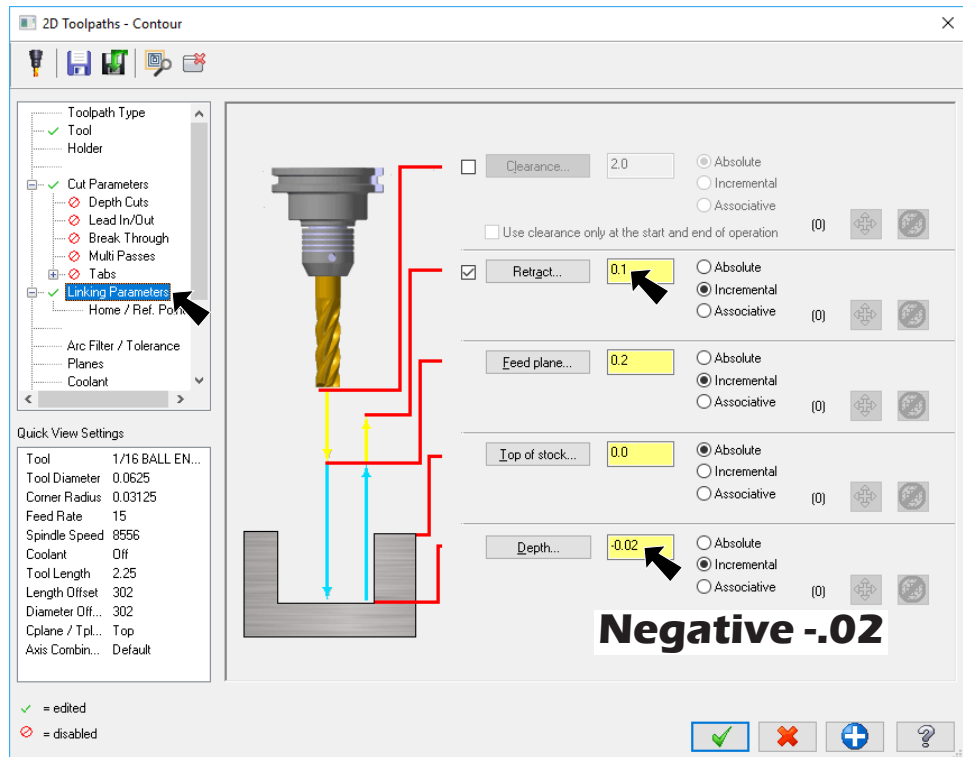
Step 17. Click OK



Step 18. Save **(Ctrl-S)**.

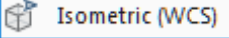


**Fig. 13**



**Fig. 14**

### C. Verify.

Step 1. Change to the Isometric View. **Right click** in the graphics window and click  (Alt-7).

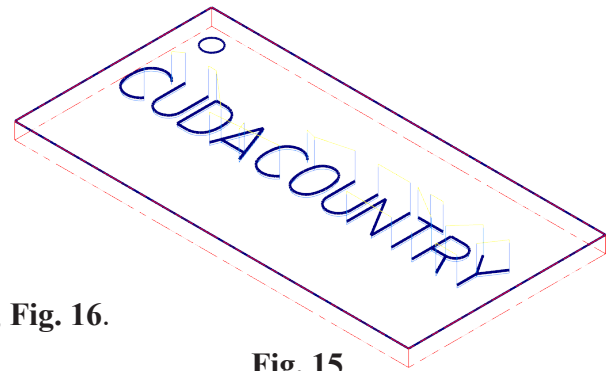


Fig. 15

Step 2. Use **Alt-T** to toggle toolpath display.

Step 3. In the Toolpaths Manager click **Verify** , Fig. 16.

Step 4. We like to **uncheck Wireframe** in the Visibility group on the Home tab, Fig. 17.

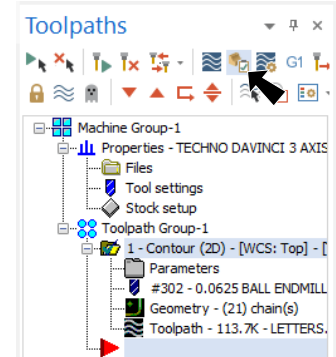


Fig. 16

Step 5. Click **Play**  (R) in playback bar along bottom of the window, Fig. 18.

Step 6. Note **Total Time** to run program under Toolpath Info in Move List panel (1min 29.75s), Fig. 20.

Step 7. Switch back to Mastercam (Alt-Tab).

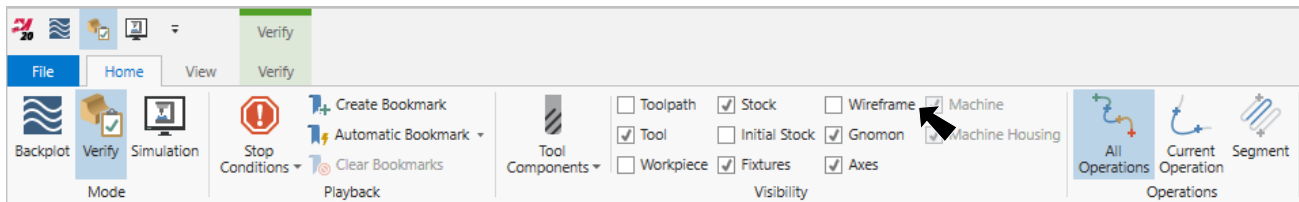


Fig. 17



Fig. 18

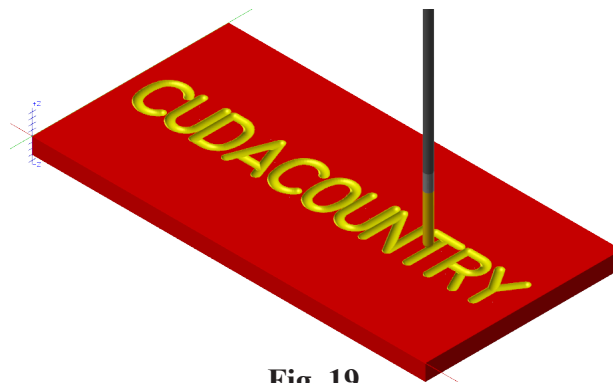


Fig. 19

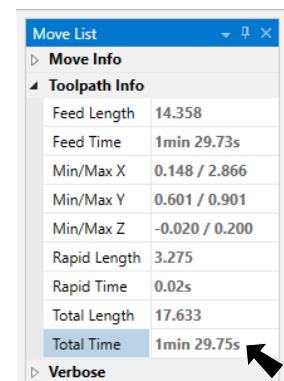
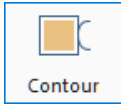


Fig. 20

## D. Toolpath For Hole.

Step 1. On the Toolpaths tab **Toolpaths** in the 2D group click **Contour**



Step 2. Click **Single** in Chaining dialog box, **Fig. 21**.

Step 3. Click the **circle**, **Fig. 22**.

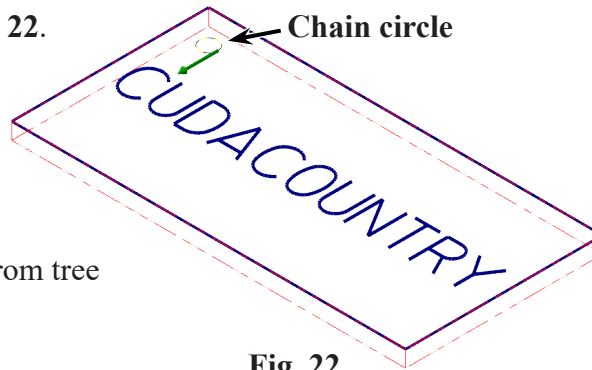
Step 4. Click **OK** in Chaining dialog box..

Step 5. Select **Depth Cuts** from tree control and set:

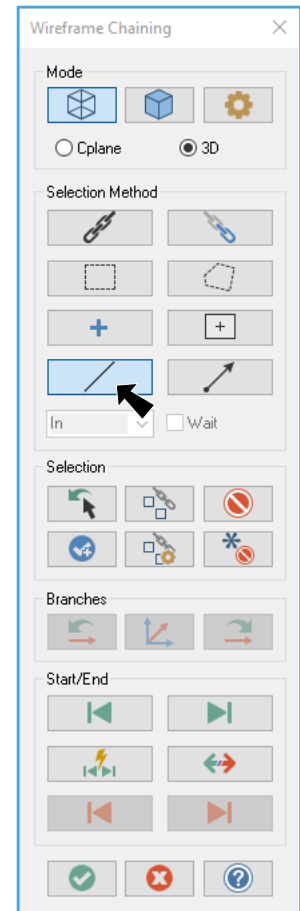
Check **Depth cuts**

**Max rough step: .03**

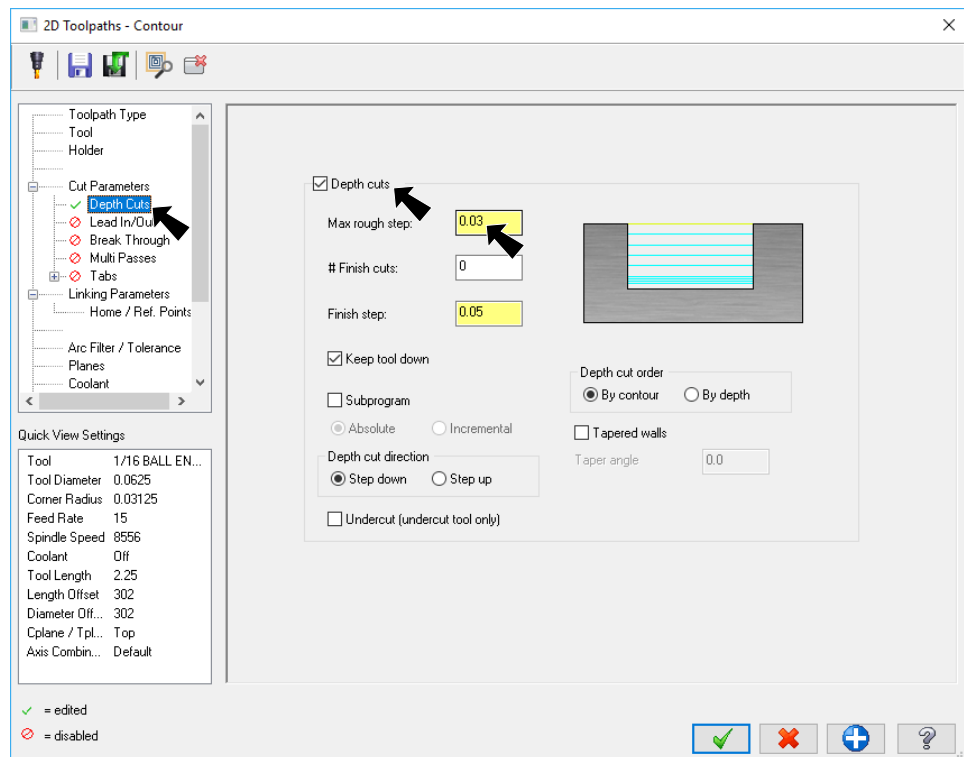
**Fig. 23.**



**Fig. 22**



**Fig. 21**



**Fig. 23**




Step 6. Select **Linking Parameters** from tree control and set:

**Retract .1**

**Depth -.14**  
**Fig. 24.**

Step 7. Click OK



Step 8. Save   
(**Ctrl-S**).

### E. Verify Hole.

Step 1. Use **Alt-T** to toggle toolpath display.

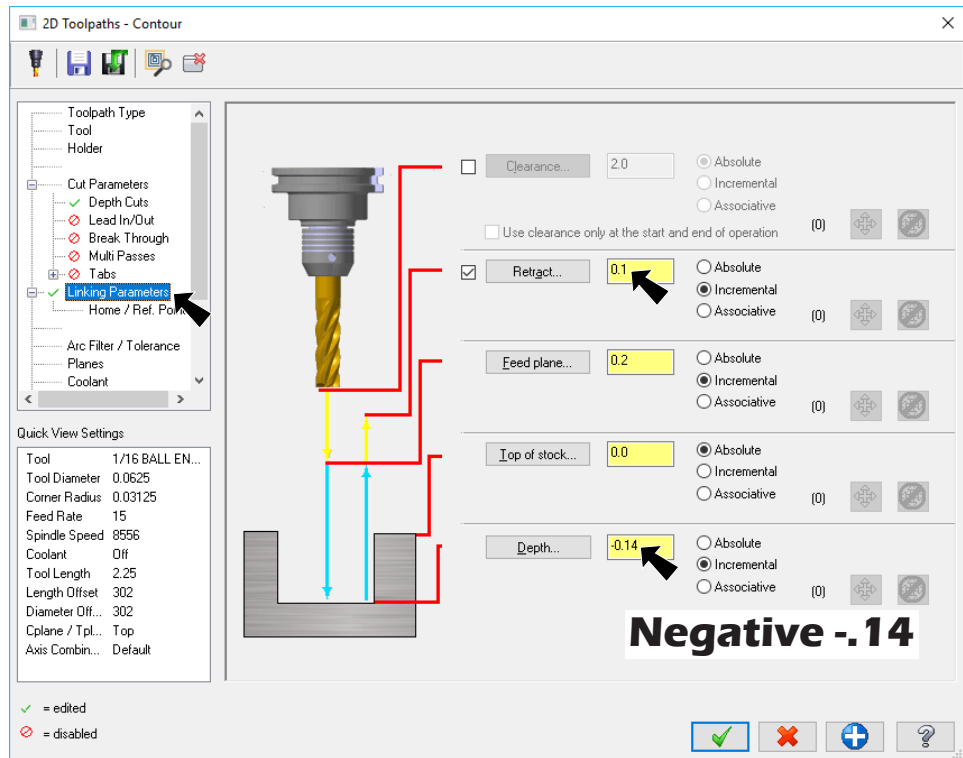
Step 2. Click **Toolpath Group-1** in the Toolpaths Manager to select **both** toolpaths, **Fig. 20.**

Step 3. Click **Verify**  in the Toolpaths Manager,

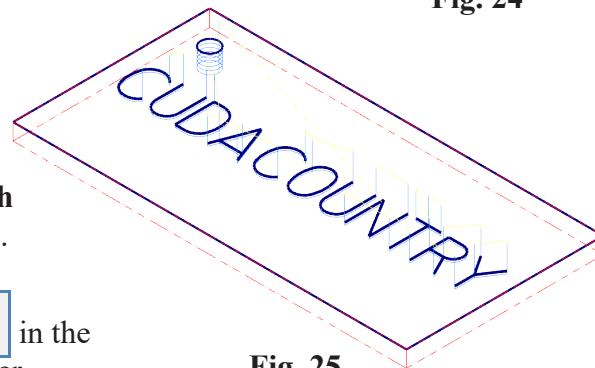
Step 4. Click **Play**  (R) in playback bar.

Step 5. Note **Total Time** to run program under Toolpath Info in the Move List panel (**1min 43.42s**), **Fig. 28.**

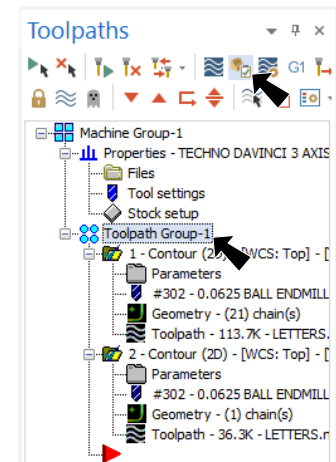
Step 6. Switch back to Mastercam (**Alt-Tab**).



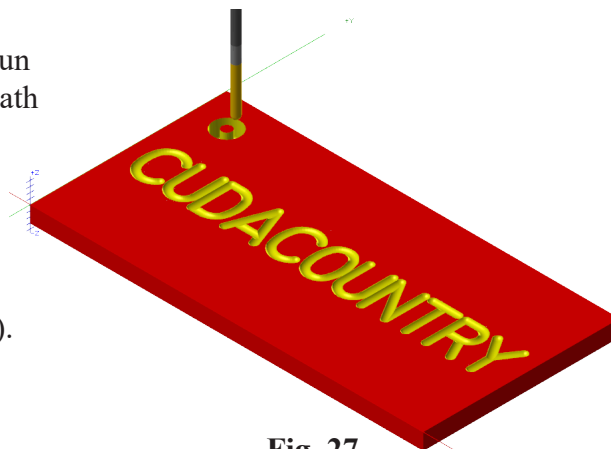
**Fig. 24**



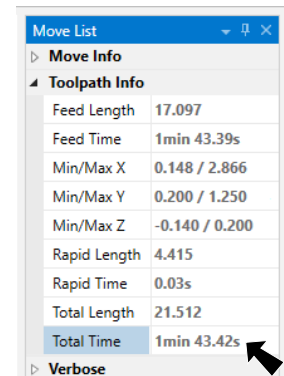
**Fig. 25**



**Fig. 26**



**Fig. 27**



**Fig. 28**