**A. Machine Type and Stock Setup.**

Step 1. If necessary, open your Hull file from Chapter 31.

Step 2. If necessary, display Operations Manager. On the View tab click Toolpaths (Alt-O).

Step 3. If Machine Group is not displayed in the Toolpaths Manager, Fig. 1, on the Machine tab, click Machine Default from the menu.

Step 4. Expand Properties (click +) in the Toolpaths Manager, Fig. 1.

Step 5. Click Stock Setup in the Toolpaths Manager, Fig. 1.

Step 6. Click All Entities box button in the Stock Setup dialog box, Fig. 2.

Step 7. Click OK in the Machine Group Properties, Fig. 2.
**B. Create Loft Surface for Blend.**

Step 1. On the Surfaces tab, click **Loft**.

Step 2. Click **Single** button in the Chaining dialog box, **Fig. 4**.

Step 3. Click to chain Chain 1 and Chain 2 on **bottom** lines of the bounding box, **Fig. 5**. If the chaining directions arrows are not pointing in the same direction - click **Reverse** in the Chaining dialog box.

Step 4. Click **OK** in the Chain dialog box, **Fig. 4**.

Step 5. In Loft function panel:
   - under **Entity** select **Lofted**, **Fig. 6**
   - Click **OK**.

Step 6. Save (Ctrl-S).
C. OptiRough Toolpath.

Step 1. On the Toolpaths tab, click OptiRough.

Step 2. Click OK in the NC name dialog, Fig. 8.

Step 3. Click the solid body to select as Drive surfaces/solid and click End Selection (ENTER), Fig. 9.

Step 4. Click Containment Select button in the Toolpath/surface selection dialog box, Fig. 10.

Step 5. Select C-plane in the Chaining dialog box, Fig. 11.

Step 6. Click Chain button in the Chaining dialog box, Fig. 11.

Step 7. Click a line on top of bounding box to chain the top rectangle, Fig. 12. Click the OK button in the Chaining dialog box.

Step 8. Click the OK button in the Toolpath/surface selection dialog box, Fig. 13.
Step 9. Select Toolpath Type from the tree control and confirm:

- **OptiRough toolpath**
- Drive surfaces and Containment

Fig. 14

Step 10. Select Tool from the tree control and:

- click Select library tool button, Fig. 15.

Fig. 14

Fig. 15
Step 11. Click the Filter button, Fig. 16.

Step 12. Click None button under Tool Types, Fig. 17.

Step 13. Click Endmill2 Sphere button second button top row), Fig. 17 and click OK.

Step 14. Click 307 1/4 Ball Endmill, Fig. 18 and click OK.
Step 15. Back in Tool page set:

Feed rate 60
Plunge rate 30
Fig. 19.

Step 16. Select Cut Parameters from the tree control and set:

Cutting method Climb
Stepover .12
Stepdown .2
Fig. 20.
Step 17. Select Linking Parameters from the tree control and set:

- Clearance plane .1
- All Leads 0

Fig. 21.

Step 18. Select Arc Filter/Tolerance from tree control and set:

- Total tolerance .003
- check Line/Arc Filtering Settings
- uncheck Create arcs in XY
- check One way filtering
- Cut tolerance 25%

Fig. 22.

Step 19. Click OK in OptiRough dialog box.

Step 20. Allow Mastercam to calculate the toolpath. Confirm the progress at the left end of the Status bar.

Fig. 22
D. Verify OptiRough Toolpath.
Step 1. In the Toolpaths Manager, click the toolpath to select and click Verify, Fig. 23.

Step 2. Click Play (R) in VCR bar, Fig. 24.

Step 3. Note Total Time to run program (39min 52.59s), Fig. 25.

Step 4. Switch back to Mastercam (Alt-Tab).

E. Finish Blend Toolpath.
Step 1. Use Toggle toolpath display in Toolpaths Manager to turn off toolpath display (Alt-T).

Step 2. On the Toolpaths tab in the 3D group click expand gallery button and click Blend, Fig. 27.

Step 3. Click the solid body to select as Drive surfaces/solid and click End Selection (ENTER), Fig 28.
Step 4. Click **Check Select** button in the Toolpath/surface selection dialog box, Fig. 29.

Step 5. Click the **lofted surface** to select as Check surfaces/solid and click **End Selection** (ENTER), Fig 30.

Step 6. Click **Blend Select** button in the Toolpath/surface selection dialog box, Fig. 31.

Step 7. Click **Single** button in the Chaining dialog box, Fig. 32.

Step 8. Click to chain Chain 1 and Chain 2 on top lines of the bounding box, Fig. 33. If the chaining directions arrows are not pointing in the same direction - click **Reverse** in the Chaining dialog box.

Step 9. Click **OK** in the Chain dialog box, Fig. 32.

Step 10. Click **OK** in the Toolpath/surface selection dialog box, Fig. 31.
Step 11. In the Surface Finish Blend dialog box set:

**Feed rate 80**

**Plunge rate 40**

Fig. 34.

Step 12. Select **Surface parameters tab** at the top of the dialog box and

Check **Clearance .05**

Uncheck **Retract**

**Feed plane: .1**

Incremental

Fig. 35.
Step 13. Select Finish blend parameters tab at the top of dialog box and

Max. stepover: .03

Click the Total tolerance button
Fig. 36.

Step 14. In the Arc Filter/Tolerance dialog box set:

Total tolerance .003

check Line/Arc Filtering Settings

uncheck Create arcs in XY

check One way filtering

Cut tolerance 25%

Click OK Fig. 37.
Step 15. Back in the Finish blend parameters tab, click Gap settings button, Fig. 38.

Step 16. In the Gap setting dialog box:

under Motion select Follow surface(s)

Check Optimize cut order
Click OK Fig. 39.

Step 17. Back in the Finish blend parameters tab, click Advanced settings button, Fig. 38.

Step 18. In the Advanced settings setting dialog box:

Select Only between surfaces
Check Skip hidden face test for solid bodies
Click OK Fig. 40.

Step 19. Click OK in the Finish blend parameters.

Step 20. Click OK to Check and Drive stock identical message.

Step 21. Save (Ctrl-S).
**F. Verify Toolpaths.**

Step 1. Click the **Toolpath Group-1** to select both toolpaths, Fig. 42.

Step 2. Click **Verify** in the Toolpaths Manager, Fig. 42.

Step 3. Click **Play** (R) in VCR bar.

Step 4. Note **Total Time** to run program (1h 5min 17.01s), Fig. 43.

Step 5. Switch back to Mastercam (Alt-Tab).