VisualMILL and the DIMD PP10 Stereo

DIMD Audio of Riga Latvia is the brain-child of Edgars Sparnins who wanted to design a high-quality tube amplifier for his wife Marta, a well-known violin player. With a Ph.D. in physics and working as a scientist in Lausanne, Switzerland, Edgars spent his spare time over the next two years researching and refining his circuit designs. He then spent another year in product design until the DIMD PP10 Stereo was born.

Kirs Tīrelis, of KITEX SIA, a CNC machine tool vendor and manufacturer, machines some of the high quality components used in DIMD Audio's PP10 Stereo using VisualCAD/CAM from MecSoft Corporation.

The images and procedures below illustrate the use of VisualCAD/CAM in the manufacturing process.

> Most of the jobs in our workshop are now machined using VisualCAD/CAM. Even after many years, I'm still surprised at how user friendly it is. It's ease of use and price/performance make it the #1 choice for entry-level metalworking workshops and a top-buy for woodwork/woodcarving shops!
>
> *- Kirs Tīrelis - KITEX SIA*

The Rear Facia

The rear facia of the DIMD PP10 Stereo is machined from a polished aluminum stock blank measuring 420mm x 61mm x 5mm. The part requires machining from both the front and the back, so you see two Setups in the Machining Job Tree. The setup for the front of the plate is named Face while the setup for the rear is named Back. Here is an image of the Rear Facia on the DIMD PP10. The sections below provide a detailed review of how an assortment of 2½ Axis machining operations are used to machine this part.
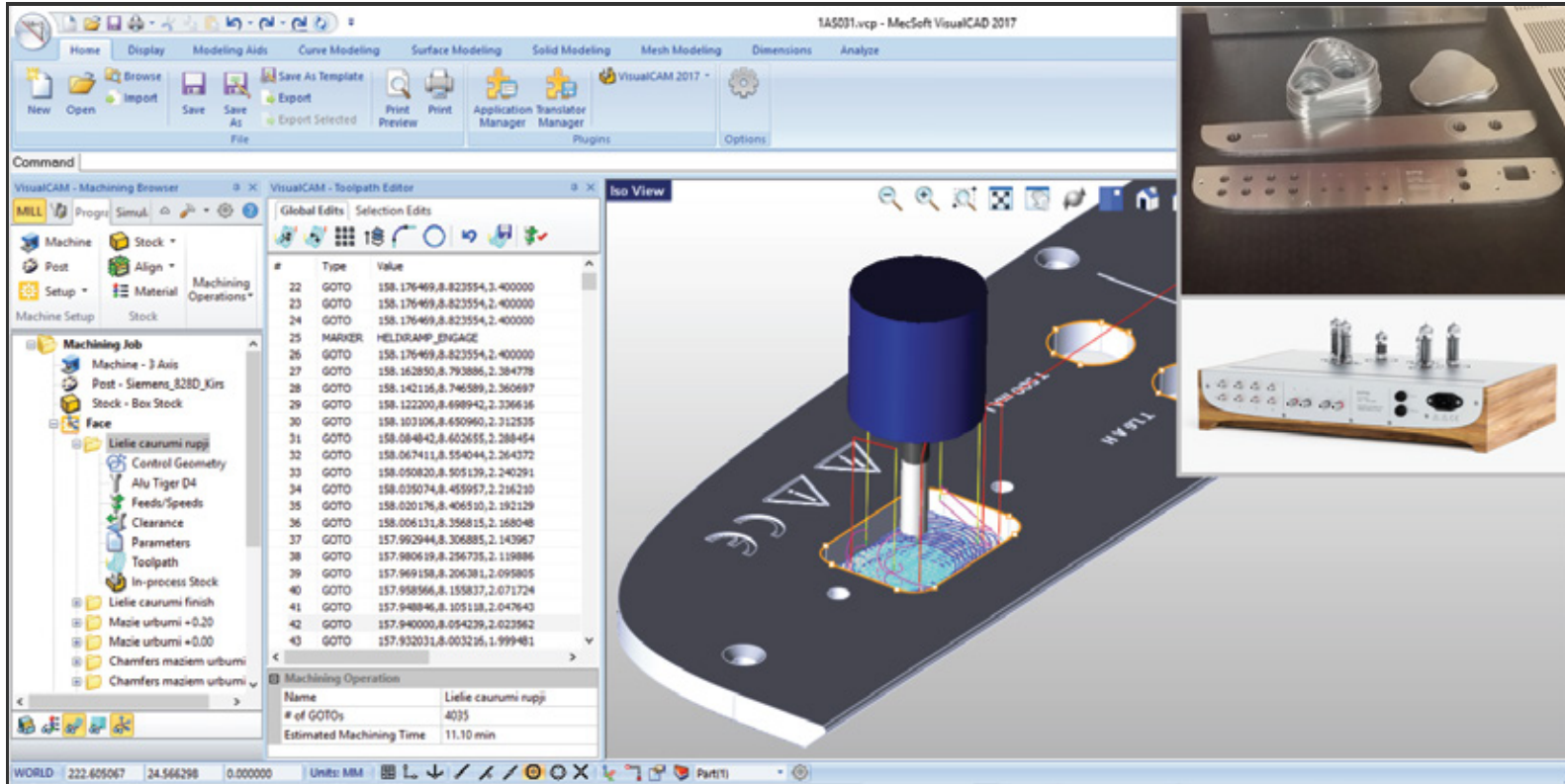

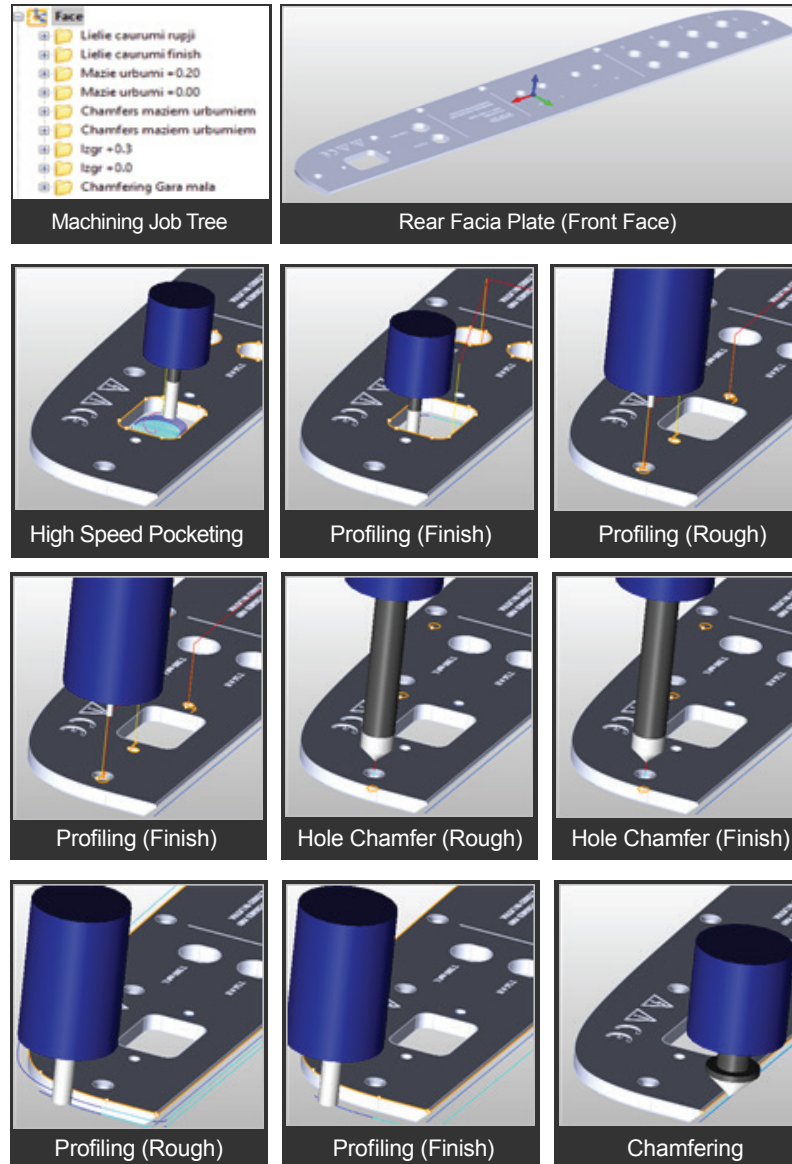**The DIMD PP10 Stereo showing the Rear Facia**

The Top Setup

In the default setup Face, you see that several cutouts and through holes are required. Kirs uses 2½ Axis toolpaths to rough and then finish this side. Multi-level High Speed Pocketing is used to rough out the material for the larger holes and rectangular pocket using a 4mm diameter flat end mill leaving 0.4mm of stock. This is followed with a finishing pass using a Profiling operation and the same diameter cutter.

For the assortment of smaller through holes, Kirs uses two Profiling operations, using the same 4mm diameter end mill, one for Roughing (leaving 0.2mm of stock) and another for Finishing. This is followed by two Chamfer Drilling operations, one for roughing and the other for finishing. With the inner pockets and holes complete, two Profiling operations using a 6mm flat end mill are used to machine the perimeter of the plate. The first cuts in three levels, leaving 0.3mm of stock while the second is a single level finishing pass. The remaining Chamfering operation cuts a 0.5mm bevel along the top edge of the part. The part is shown below in VisualCAD/CAM with each operation identified.

The rear facia plate of the DIMD PP10 Stereo is shown in VisualCAD/CAM. On the far left we see the Machining Browser. To the right is the Toolpath Viewer/Editor where the tool motion coordinates can be viewed numerically and graphically on the screen.

The sequence of toolpath operations in the top *Setup Face* are shown below:

Machining Job Tree	Rear Facia Plate (Front Face)

|		
High Speed Pocketing	Profiling (Finish)	Profiling (Rough)
Profiling (Finish)	Hole Chamfer (Rough)	Hole Chamfer (Finish)
Profiling (Rough)	Profiling (Finish)	Chamfering

The Bottom Setup

For the bottom setup named Back in the Machining Job Tree, the part is turned over on the CNC machine. In this setup, three threaded holes are machined, first using a Hole Profiling operation and a 2mm diameter flat end mill, followed by a Thread Milling operation using an M4 thread milling tool.
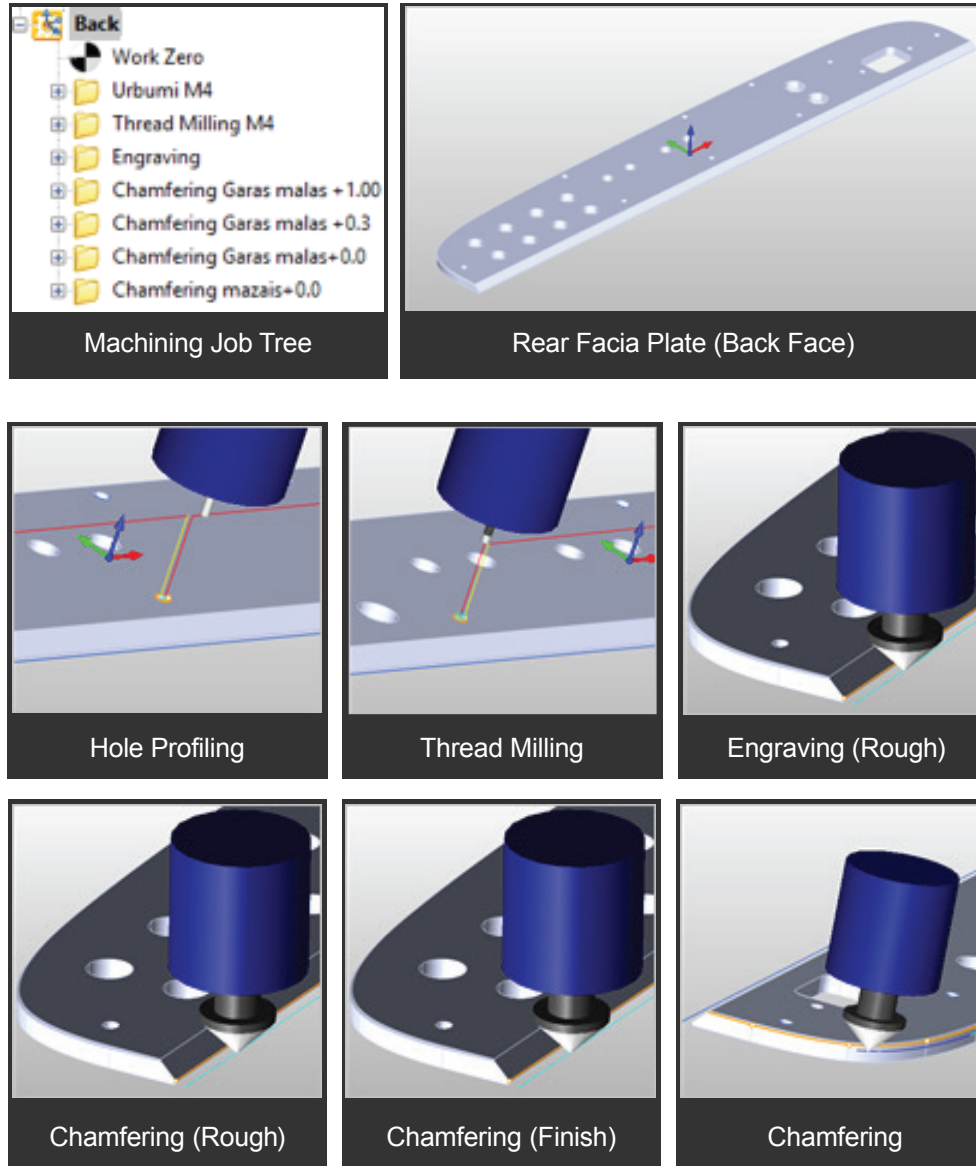
To machine the large bevel on the top inner edge of the plate, Kirs first uses an Engraving operation and a 45-degree tapered milling tool to remove the bulk of the material along this edge. This operation removes 4mm of material in two roughing passes.

The convergence of beveled edges on this part is shown in the image below.
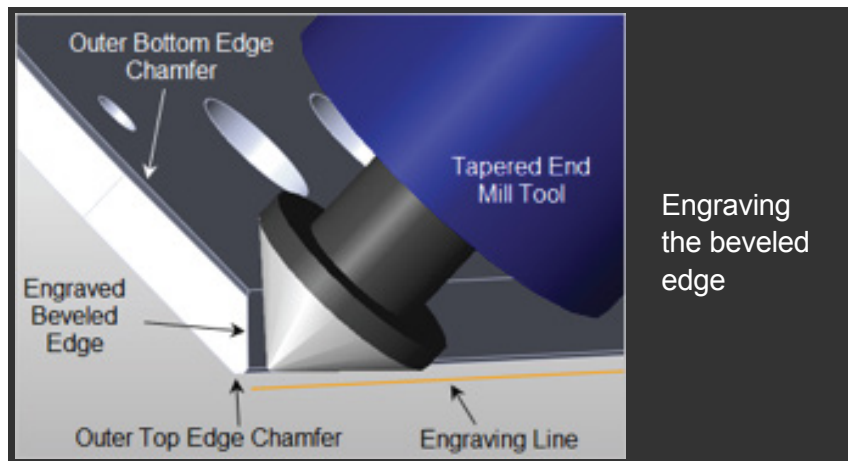
The Engraving is followed by two Chamfer operations, the first being a rough pass and the second being the final finish pass. This completes the large 4mm deep bevel. To complete the part, one final Chamfer operation is used to machine the smaller 0.36mm deep 45-degree bevel along the outer perimeter of the part, again using the 45-degree tapered end mill tool.

Want to see how **VisualCAM** can help you? Click Here to download a demo.

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The sequence of toolpath operations in the Back *Setup* are shown below:

Machining Job Tree

Rear Facia Plate (Back Face)

Hole Profiling

Thread Milling

Engraving (Rough)

Chamfering (Rough)
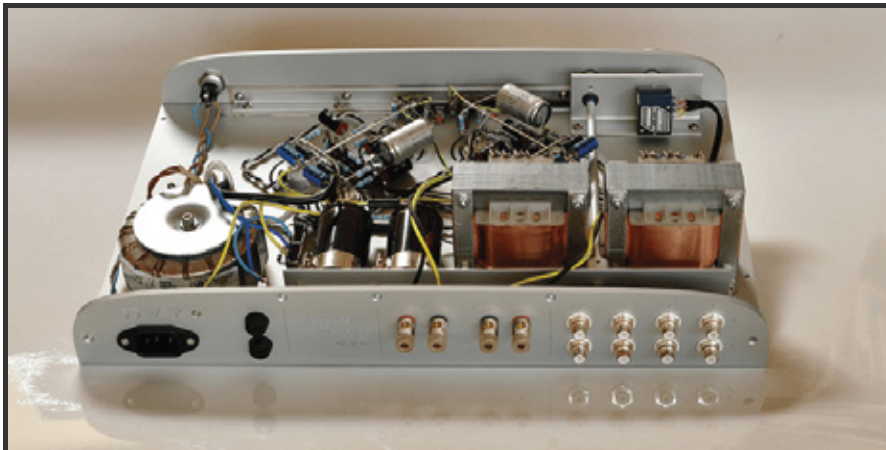

Chamfering (Finish)

Chamfering

More Images of the DIMD PP10 Stereo

The DIMD PP10 Stereo (Front)

The DIMD PP10 Stereo (Back)

The DIMD PP10 Stereo (Cover Removed)

DIMD PP10 Stereo components machined with VisualCAD/CAM

For more information about DIMD Audio and KITEX SIA:

- The DIMD PP10 website

- The DIMD Audio Facebook page

- KITEX SIA CNC Services

For more information about VisualCAD/CAM

VisualCAD/CAM is available in 5 different configurations (Express, Standard, Expert, Professional and Premium). The part shown here was programmed using the Professional configuration.

The Standard configuration of VisualCAD/CAM has all of the 2½ Axis toolpaths used in this part. However, the Professional configuration allows Kirs to program both sides of the part (i.e., multiple Setups) in the same part file!

Here are some additional details about each of the available configurations. Click here for the complete features list.

- **VisualCAD/CAM Express:** This is a general-purpose program tailored for hobbyists, makers and students. Ideal for getting started with CAM programming. Includes 2 & 3 axis machining methods.

- **VisualCAD/CAM Standard:** This is a general-purpose machining program targeted at the general machinist. This product is ideal for the rapid-prototyping, hobby and educational markets where ease of use is a paramount requirement. Includes 2-1/2 Axis, 3 Axis, and drilling machining methods.

- **VisualCAD/CAM Premium:** Includes the Standard, Expert and Professional configurations plus 5 Axis simultaneous machining strategies.

- **VisualCAD/CAM Expert:** Includes the Standard configuration plus 4 Axis machining strategies, advanced cut material simulation and tool holder collision detection.

- **VisualCAD/CAM Professional:** Includes the Standard and Expert configuration plus advanced 3 Axis machining strategies, 5 Axis indexed machining, machine tool simulation, graphical toolpath editing and a host of other features.

To read more about VisualCAD/CAM and other MecSoft Corporation products including screen images, resources and features lists, please visit our Product page. You can also demo our products to take them for a test drive!