RhinoCAM at AirMotive Specialties!

One of the most exciting things we get to do here at MecSoft Corporation is giving voice to many of the thousands of hard working men and woman who use our software on a daily basis while fulfilling their life's passion through manufacturing.

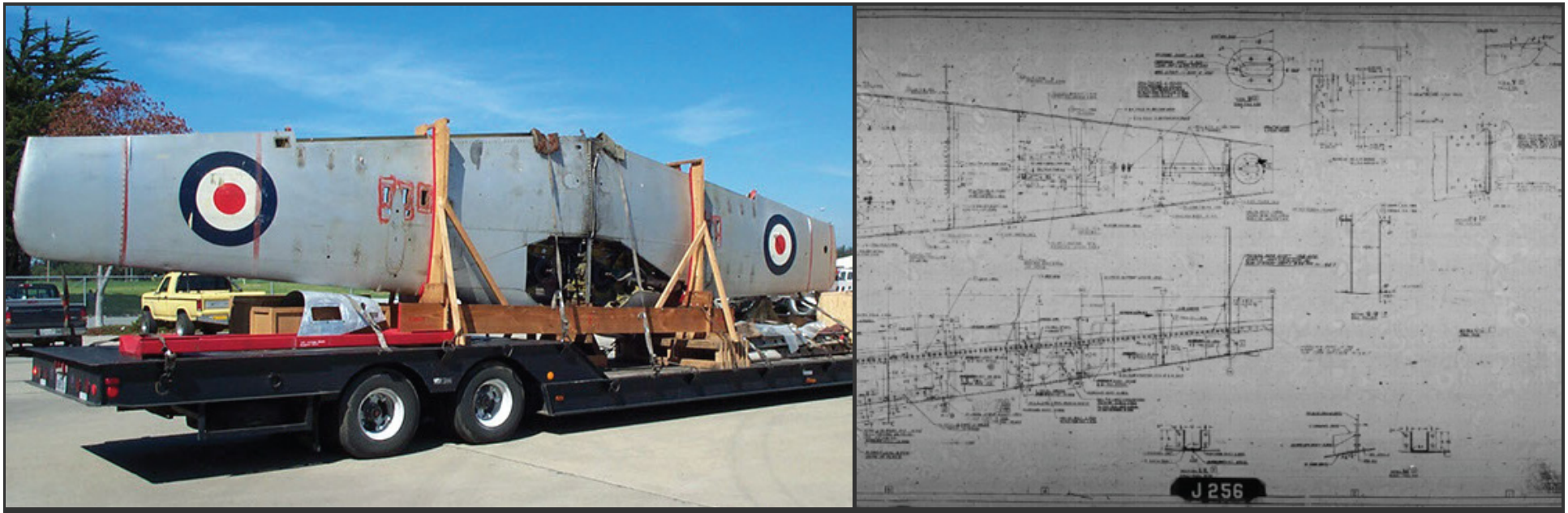
Dave Teeters, president and operator of AirMotive Specialties, Inc. (Salinas, CA) has been building airplanes since the age of 10, bucking rivets and tearing down engines with his dad (Art Teeters) at Tom Peck Aviation. As Dave grew, so did his fascination with airplanes. Like many children, Dave built and flew model airplanes. Unlike most, however, Dave learned to fly, completing his first solo flight at the age of 16 and he didn't stop there! Dave continued working on airplanes and became a certified aviation mechanic while graduating from high school!

The North American PS1D Mustang fighter restored to its former glory by AirMotive Specialties Inc.

AirMotive is known worldwide for its work in restoring vintage P51 Mustang Fighter aircraft (shown in the image above), each requiring anywhere from 16,000-22,000 man hours of restoration time, resulting in multi-million dollar aircraft investments.

The Restoration Challenge

Restoring and replacing components for these vintage aircraft can be difficult and time-consuming. Without the benefit of digital CAD drawings or 3D models, Dave and his team of dedicated professionals must rely on original components when available and the military's own original WWII design drawings & specifications archived on microfilm!



(Left) Original aircraft components are shown being retrieved from the field. The refurbished aircraft is shown at the end of this article Aircraft with Dave in the cockpit! **(Right)** WWII era tail section drawing of the P51 Mustang!

The RhinoCAM Advantage!

Dave incorporated Rhino 5 and RhinoCAM into AirMotive in 2015 and started generating toolpaths in just one hour of training with the software! The company immediately began experiencing higher quality and lower man-hour costs, says Dave.

In the example shown below, Dave used the touch probe digitizer on their ShopSabre CNC router to digitize this skin panel from an existing P51 aircraft. With no previous experience with CADCAM software, Dave was able to create the desired Rhino surface and then design a die that he cut on his CNC machine using RhinoCAM toolpaths. The die was then used to form-press the aluminum skin component before being heat treated.

> ***"The support you guys have provided us has literally saved me from a tremendous loss of business! We took on a large amount of work at the time and because you were willing to work with us as we got up to speed with the software, we were able to get that work done on time and on budget! Thank you MecSoft!"***
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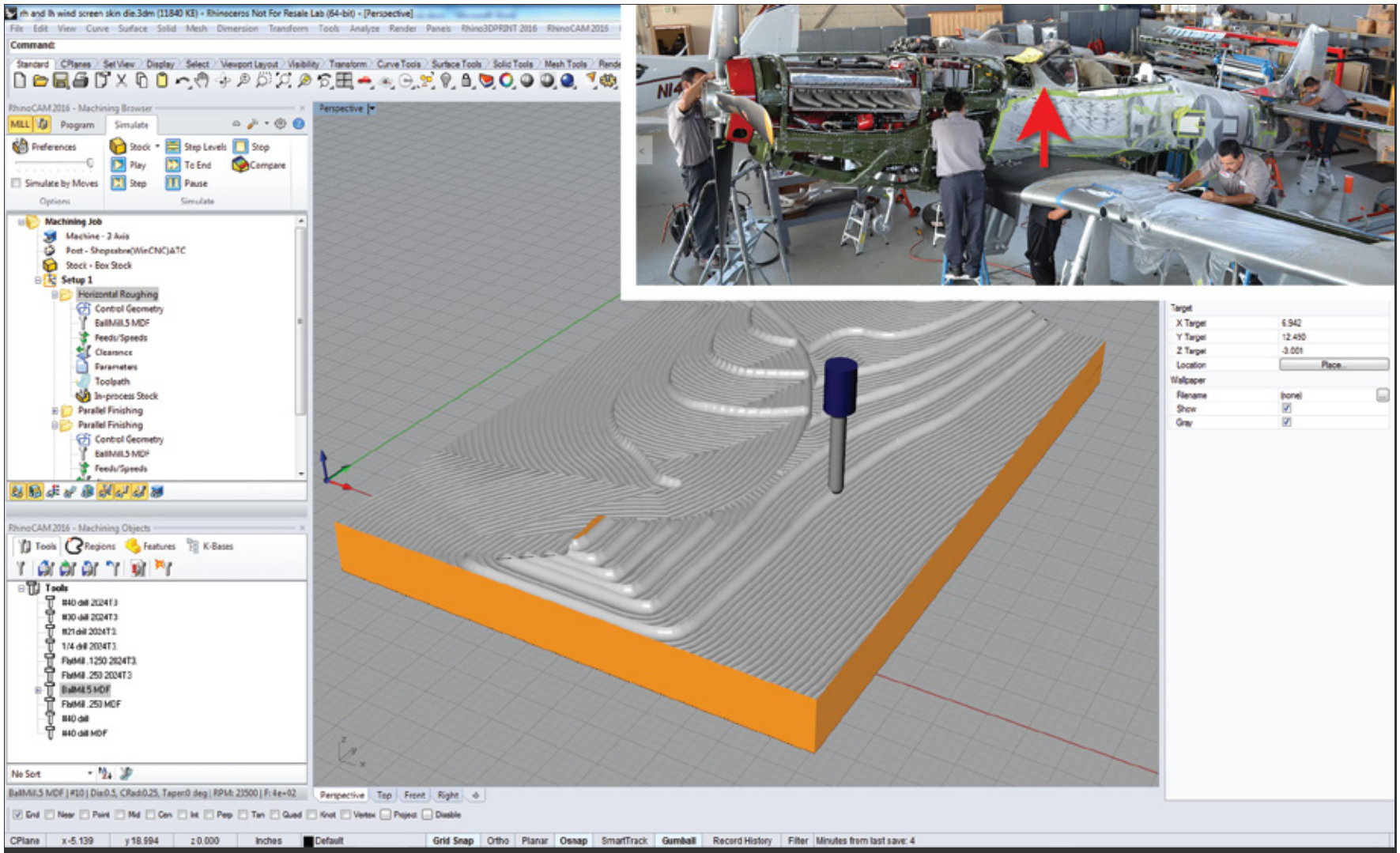
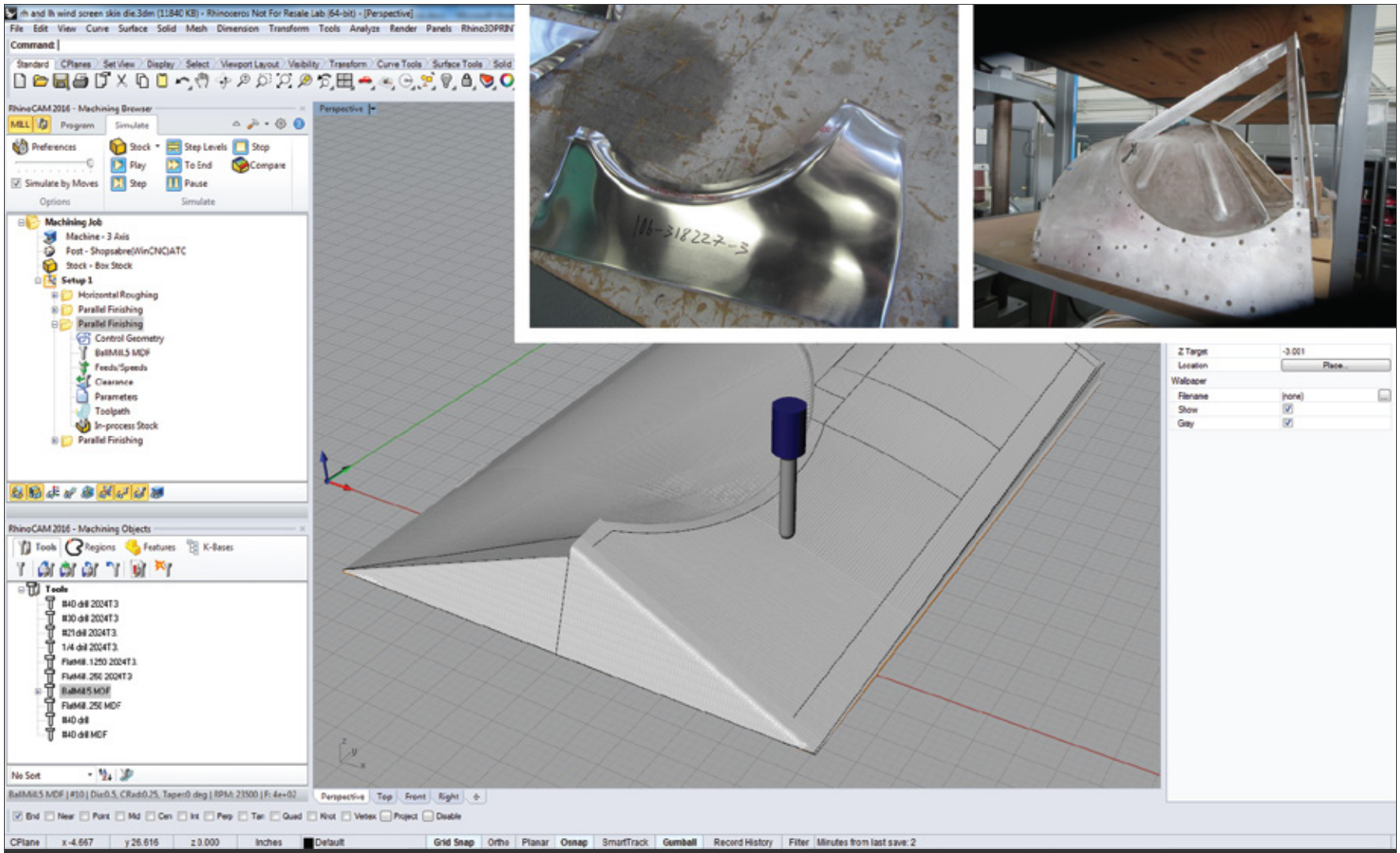
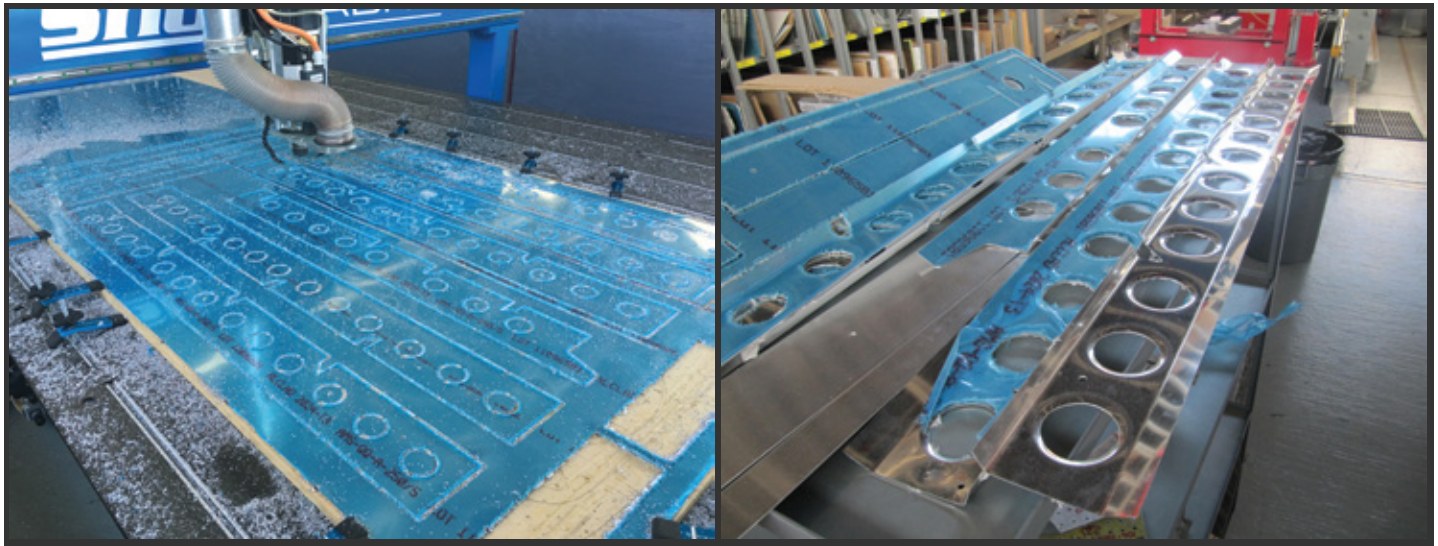
> ***"Before RhinoCAM, we would spend an entire day with an English wheel hand-forming the compound curvatures of these skin panels. Now, with my ShopSabre CNC router and RhinoCAM, I machine one die that we can use to form-press multiple skin panels with greater accuracy and in a fraction of the time! This has been a huge advantage for us!"***
>
> – Dave Teeters, AirMotive Specialties, Inc.



(Main Image) a form-press die for the P51 Mustang Fighter aircraft cockpit skin panel is being simulated in RhinoCAM with a 3 Axis Horizontal Roughing operation shown. **(Inset)** An actual P51 in the air is shown with the location of the skin panel indicated. That's Dave Teeters in the cockpit, AWSOME!



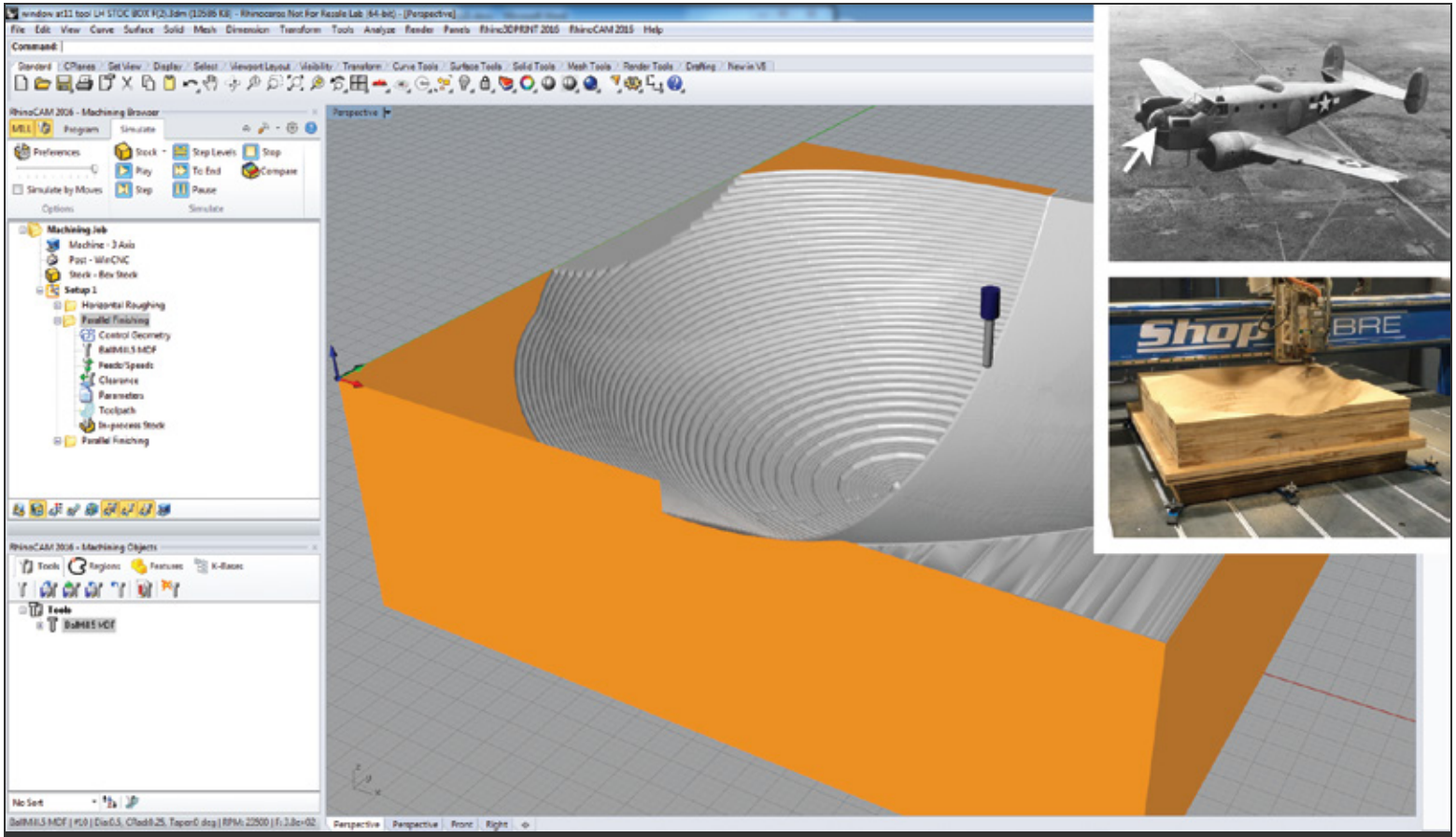
(Main Image) The 2nd 3 Axis Parallel Finishing operation is being simulated in RhinoCAM.
(Inset Left) The resulting skin panel created from the die. **(Inset Right)** The skin panel assembly and fixture supports'.



(Left) The AirMotives 12x6 ShopSabre CNC Router is busy machining
Aft Spar to Skin supports from RhinoCAM toolpaths.
(Right) The finished Aft Spar to Skin supports, fresh off the press and ready for assembly.

The Beechcraft AT-11 Front Canopy

Another project Dave and the team recently completed with the help of RhinoCAM were vacuum formed front canopy sections for a WWII era Beechcraft AT-11 training aircraft produced from 1937-1970 by Beechcraft Corporation (pictured inset below). The existing canopy was reverse engineered into Rhino using point cloud data from a touch probe sensor. The resulting surface was then used to design a vacuum form die that was machined using RhinoCAM toolpaths and AirMotive's ShopSabre CNC machine (shown inset below) out of high-density MDF. Click Here to see a short video clip of the actual die being machined.



(Main Image) 3 Axis Parallel Finishing toolpaths for a front canopy section of the Beechcraft AT-11 training aircraft is shown being simulated in RhinoCAM using a ½ Inch Ball mill with a 15% (0.0075) step over.

(Right Top) An actual WWII era image of the Beechcraft AT-11 with the front canopy indicated (historical image courtesy of Wikipedia and Beechcraft Corporation).

(Right Bottom) The vacuum form die is being machined on the ShopSabre CNC machine from 36x36 laminated sections of High-Density MDF.

Today, Dave and his team at AirMotive Specialties use RhinoCAM to manufacture many other components of the P51 Mustang and other vintage aircraft, with the same high degree of accuracy and efficiency! Dave Teeters and AirMotive Specialties is truly an American success story in flight!

For more information about AirMotives, you can visit their website at www.airmotives.com.

Yes, that's Dave Teeters in the cockpit of a completely restored vintage WWII era P51 Mustang Fighter aircraft - A true American success story in flight!