The Design Explorer
The Ashlar-Vellum User Newsletter

First Quarter, 2015

Have You Downloaded the Latest Graphite™ Hot Patch?

The latest hot patch of Graphite v9 SP1, Hot Patch 2 was released earlier this quarter. If you're a Graphite v9 user who hasn't updated to this latest hot patch, you're missing out. This release:

- Fixes a bug in the Offset tool.
- Solves an issue translating into and printing from DWG.
- Eliminates a crash condition when exporting a file with a defective dimension.
- Incorporates the reworked the Symbol dialog box.
- Offers enhanced reliability during numeric entry.

These changes will be merged into the programs of our technology partners including Vellum Nitrogen™, and AlphaCorr Rules™ and SteelRules™.

Latest News on Graphite

Graphite development is starting to turn it's attention to v10. The programming, tech support and management teams are reviewing the lists of enhancements, features and fixes, and setting priorities in light of customer needs and the impact on sales. In the near term, development continues on things for our worldwide technology partners, with all applicable functions being added to the Graphite engine.

Changes to Alchemy™

TransMagic, the power behind our Alchemy:Adept and Alchemy:Essential file translation products has changed to a subscription licensing model rather than a permanent license sales model. While we would be happy to also move to a subscription basis, we don't have the sales volume to be a profitable partner for TransMagic at this time. We are looking at ways to continue to offer extended file translation capabilities to our customers. More information will be coming in the months ahead.

Extended Support Hours Coming

Starting in early May our technical support hours for Ashlar-Vellum and AlphaCorr will be extended later into the day, better covering the west coast of the US. Starting at 8 am Central Time, it will then extend to 10 pm Central Time. The extra support will be covered by a new higher who speaks fluent English and Spanish. More on that to come.

Export *Nasties* from Other CAD Programs

Our tech support department is often asked, "Why is this 2D file, which looks so simple, such a big and complicated mess when imported?" The answer is in the way that 2D file was exported from its original source.

Sometimes when opening a simple looking file imported from another CAD, 3D modelling or other drawing program, what was intended to be perhaps a dozen arcs or splines suddenly becomes tens of thousands of tiny line segments or points. This is not in any way an Ashlar-Vellum bug. Graphite, Cobalt™ or any other members of the Ashlar-Vellum team is merely reading what it has been given. The systematic *tessellation*, or breaking into tiny line segments, is the fault of the source program from which it was exported.

Most 2D files with this problem got this way by experiencing one of the following four issues originating in their source drafting, modelling or drawing program:

- Tessellation during 3D to 2D conversion
- Tessellation during export
- Tessellation during printing to PDF
- Tessellation during creation by an imprecise modelling program

Each one of these methods has difficulties for different reasons and each one has different solutions.

Tessellation During 3D to 2D Conversion

The problem is that many 3D modelling programs assume that the 3D to 2D conversion is just for printing so it creates a *drawfile* which designated the arcs, splines and lines as tiny line segments or dots. This is exactly what the printer wants. Unfortunately, anyone who wants to reuse that 2D data in another program is sunk.

Solutions: Use precision settings for the 2D drawing. For example, in Cobalt, Xenon™ and Argon™, this is done during the 2D Sheet View creation or editing process.

Be sure to select the *Precise Curves* option for the 3D higher order entities to stay intact, rather than faking it with the imprecise (but faster to calculate) *Polyline* option.
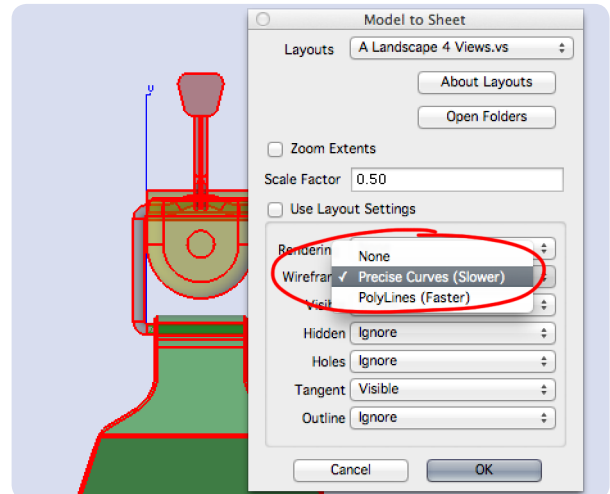

Set the Sheet View to use Precise Curves so that the drawing keeps the higher order geometry. (Ski piercing model by Walter Arnold.)

Most, but not all, competitive software offers these settings. Should you be using software that does not, optionally you can use a different product for the conversion. For example, bring an SAT file into Cobalt then export it as a DWG or PDF file as needed.

Tessellation During Export

The reason the file is big and cumbersome is simply bad export technology on the part of the source CAD program. Some competitive drafting, modelling and drawing programs merely export in the lowest common denominator, which are tessellated line segments. This is simply laziness on the part of the software programmers who only want to write one subroutine instead of the 50 or so necessary to send the geometric equations for all of the variations, like a 3-point arc to 3-point arc, through-point spline to through-point spline, or centre-point circle to centre-point circle.

Continued...
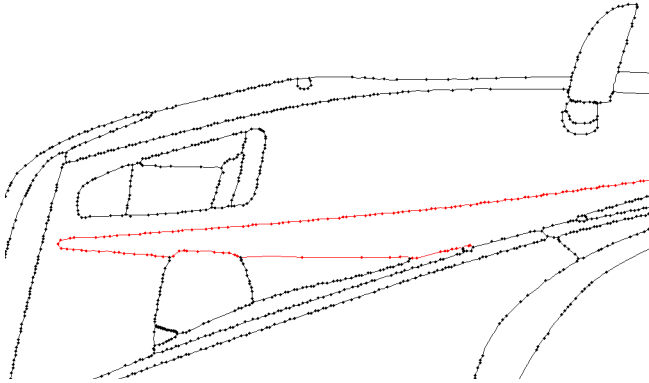
Some competitive CAD programs do not export anything more than the lowest common denominator of geometry.

Solution: Contact the manufacturer of the original software for suggestions on a different format with a more precise data export.

Tessellation During Printing to PDF

The Print to PDF process always tessellates the geometry due to the nature of the PDF print driver.
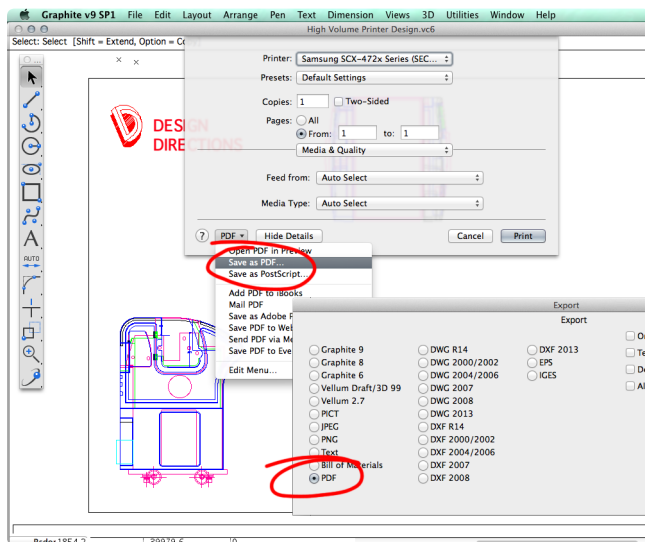
Usually Save to PDF offers the best fidelity for keeping higher order data. (High speed printer drawing by Satish Gokhale.)

Solution: Use the Export to PDF or the Save to PDF options rather than Print to PDF. But beware: Not all of these are created equal. Sometimes a lazy programmer will say, "Oh we need to export to PDF? I'll just make a fast pipeline to the Print to PDF," and the data will be the same low-level geometry.

Usually the Save to PDF is a safer option, but you'll need to try the options to be sure. Of course, Ashlar-Vellum's Export to PDF maintains the higher order data.

Tessellation During Creation in an Imprecise Modelling Program

When 3D models are created in imprecise modellers, such as SketchUp or 3D Studio Max, or typically if the model was a 3D scan, their best available data is merely 3D tessellated data. More precise data was unavailable from the beginning.

When something was created in an imprecise modeller the only option for higher order data is to redraw in a precision CAD or 3D modelling program.

Solution: The only solution here is to redraw using the 2D drawing or 3D model as a reference for the points need.

Success is No Shock for American Suspension

Vince Costa's life-long passion for motorcycles is reflected in American Suspension, his company that designs and manufactures high-end motorcycle suspension parts and systems for American bikes. His passion for using Ashlar-Vellum computer-aided drafting software also began early with Vellum® 2.7. Today he uses Graphite™ CAD software to draw the forks, brakes, wheels and shocks for customized American motorcycles. Costa tells us, "Graphite just seems to work fast, which is really important because we have to be continually coming up with new ideas."

One of the company's most innovative ideas is an inverted front fork with an integrated brake caliper in the lower fork leg and an integral brake line. This provides three things:

- Improved aesthetics for motorcycles often seen as works of art, selling in the $50,000 price range.
- A more powerfully functioning brake caliper because all of the strength of the lower leg is used in the structure.
- A lower manufacturing cost because one part can be machined to perform multiple functions.

Costa has patented the various parts and used them to successfully fend off overseas manufactures.

Awhile ago, custom bike builder Paul Teutul, Jr. began to collaborate with Costa creating innovative assemblies from Costa's stable of suspension systems. When the Discovery Channel held the *American Chopper Build-off* to decide who was the greatest custom motorcycle builder in the world, Teutul called Costa to brainstorm ideas. Costa tells us Teutul was looking to design the most fantastic, well designed bike they could possibly conceive and make it happen in a very short amount of time. Together they thought through the design.

Costa had been working on a concept that included ribs and rivets, giving it a look like something out of Jules Verne. Drawing further inspiration from P51 Mustang fighter planes, the two decided to try a never-before-used single-sided swing-arm front suspension, which attached the wheel on just one side, leaving the other side open, similar to a plane's retractable landing gear. They also took the suspension unit out of the inverted fork and made it into the steering neck, bolting in the front with a specially made frame and steering mechanism so the suspension could move up and down while the handlebars remained steady.

Costa admits the pressure was high because he and the frame maker were producing parts on the west coast and sending everything to Paul Teutul, Jr. for completion in New York. Working entirely from drawings, there was no time to test this front suspension before it had to be assembled on live TV. But it all worked…winningly. Costa concludes,

"I have to give your program credit. It's so easy to use and so quick. For designing suspension stuff like what I'm doing, it's like being able to sketch. It's just really, really good for doing that because I can do stuff so quickly and make changes. So it really helped when we were making it."

Paul Teutul, Jr. on the winning bike in the *American Chopper Build-off*.

Costa's innovative suspension designs integrate the brake caliper into the front fork for better aesthetics, performance and cost to manufacture.
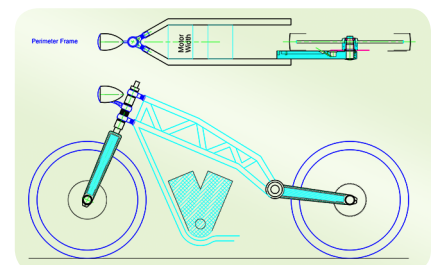
Concept drawing for the single-sided swing-arm front suspension which attached the wheel on just one side.

Background/Contact

For more details on this project contact:

Vince Costa
American Suspension
5281 Research Drive
Huntington Beach, CA 92649

(714) 899-7076

info@americansuspension.com

www.americansuspension.com