

## TurboCad and Geometric Editing

**Date:** August 11, 2007 05:38 PM

**Author:** Joseph Milanese ([csengineering@sbcglobal.net](mailto:csengineering@sbcglobal.net))

**Subject:** Who needs the history tree?

Disclaimer: The following is only my biased and uninformed opinion. It may prove terminally uninteresting to anyone not abnormally fascinated with TurboCad, and even some who are. Read at your own risk.

Let me start by saying that I am a huge fan of TurboCad. I have been using it casually since V4 and intensively since V9, when I started (along with a partner) an engineering and manufacturing company that builds high speed cap sorting equipment for the packaging industry (if you are interested, see [www.capfeeder.com](http://www.capfeeder.com)). In the first year of business, when I essentially had no income, a \$5,000 to \$10,000 CAD package would have been out of the question. So in a sense, TurboCad's affordability made our later success possible. I have found it to be very versatile and the benefits of working in 3D for machine design have been enormous. There are many jobs that we have tackled that I probably could not have done profitably without TurboCad. Since for the four years we have been in business, the average cost of ownership has been less than \$150/year, I would say that TurboCad has had the best return on investment of any tool that I have purchased for my business. I have also compared it to other relatively low-cost 3D options, including Alibre, and have not been seriously tempted to switch.

Having stated how much I love TurboCad, I will now proceed to complain endlessly about its flaws. I believe this could be construed as constructive criticism.

The largest "flaw" is a kind of philosophical disagreement I have with where the emphasis has been placed for the last several releases. Although there have been many useful tools added and significant improvements to the import/export filters made, the vast majority of changes involved constraints and history based editing. Thankfully, the use of these tools is optional. If it were not, the program would be unuseable in a professional environment. Using constraints or keeping the part history activated in a drawing of any complexity makes the chances of drawing corruption enormously higher. Am I the only who feels this way? I don't think so. Among those posting their professional work here, there is rarely any mention of constraints, and the advice is often given to shut off part history when boolean operations fail. When constraints are used, it is typically to explore the "neato" factor, rather than to make money. Incidentally, I have experimented with Alibre, and its parametric functions make it just as likely to crash as TurboCad's.

A particular complaint I have about part history is that it has to be activated for drafting palette objects to update automatically. Since I never activate it, this means I am missing out on a feature that has been on my wish list for the last four releases.

I would like to suggest that TurboCad turn its attention to geometry based editing. That is, editing that is NOT based on the history of creation, or on parametric relationships. This is sometimes called direct editing in parametric CAD software (like Solidworks and Alibre). The CAD program that leads in the development of geometry based editing is KeyCreator, by Kubotek. Imagine TurboCad's Facet Editing capabilities, but immensely more powerful. You can recognize features like holes and chamfers and copy them; you can stretch 3D objects; and you can flatten any object that meets certain dimensional requirements that allow the software to consider it a sheetmetal part (uniform thickness). Unlike parametric software, however, it makes no difference how the objects were created. Every command starts with geometry, makes its modification, and ends with geometry. The "intelligence" is embodied in the algorithms written by the programmer, not in parametric relationships defined by the user. I don't doubt there are situations where user defined parametric relationships are very useful. But when you are designing new things, rather than slight variations on existing things, the advantages of geometric editing are clear: More stable and smaller files, MUCH better file compatibility when using other CAD formats, and the ability to clearly see what effect your changes will have. Why not buy

KeyCreator, you ask? Well, its expensive, for one. For another, I DO like TurboCad very much, and I hope to see it become an even better value.

As another indication that geometric editing is gaining momentum, I believe one of the founders of SolidWorks recently founded a company to market software which is much more geometry based, but the name escapes me at the moment.

One last request: If you add sheetmetal unfolding to TurboCad, please make it history-independent! I could go on, but my fingers are getting tired. Please voice your opinions - maybe I'm wrong and constraints/history are widely used and desirable. If so, I would like to know.

**Date:** August 11, 2007 06:08 PM

**Author:** D. Cheke

**Subject:** Everything you said, you said well.

Although I am not familiar with the geometry based functions it sounds very useful and I would take it any day over constraints - which I feel are ridiculously unfriendly and not useful at all in their current state.

I agree about the part tree too. Although it has improved it still has a long way to go before it is reliable. I really like a lot of the things IMSI is doing with the program but I wish that they would concentrate fully on what already exists within the program to ensure optimum performance - tool wise and memory wise. After that, then concentrate on tools that enable users to create and edit their many paper spaces quickly.

**Date:** August 11, 2007 06:57 PM

**Author:** Pat Collins ([cjmcrp@grm.net](mailto:cjmcrp@grm.net))

**Subject:** Excellent post.

Joseph, This maybe your opportunity to get some or all your suggestions. Checkout the post "TC Ver.14 user in need for review. It suggests that they (IMSI) may be open to the opinion of the consumer. Hope they listen for a change.

**Date:** August 14, 2007 12:17 PM

**Author:** Wesley Hughes ([whughes@northstate.net](mailto:whughes@northstate.net))

**Subject:** Constraints Fans Where Are You?

Is there anyone out there who uses Constraints and likes them? Is there, "The other side of the story?" I would like to hear it.

**Date:** August 18, 2007 06:44 PM

**Author:** Henry O. Hubich ([hhubich@comcast.net](mailto:hhubich@comcast.net))

**Subject:** Constraints have lost a large portion of their usefulness.....since the Normal Extrude tool was dropped from TurboCAD.

**Date:** August 18, 2007 08:11 PM

**Author:** gord ([missionwb@shaw.ca](mailto:missionwb@shaw.ca))

**Subject:** Constraints

I work in architectural millwork. Two of the tools that I seem to be using consistently these days are "loft" and "normal extrude". I still am using V11.2. I have had no need to even try constraints.

I have noticed the comment about "normal extrude" being dropped. Has here been any reason given? What is the replacement?

**Date:** August 19, 2007 11:06 AM

**Author:** Henry O. Hubich ([hhubich@comcast.net](mailto:hhubich@comcast.net))

**Subject:** The "replacement"

...is *Sweep* and *Rail Sweep* and *Simple Extrude*. These actually work quite well, once you learn how, but none offers an important attribute of Normal Extrude: If you enable "Use Compound Profile" and "Select Extrusion Path," then you can edit either the profile or the path -- or both -- after Normal Extruding, and the extrusion will automatically update itself accordingly.

**Date:** August 19, 2007 11:32 AM

**Author:** gord ([missionwb@shaw.ca](mailto:missionwb@shaw.ca))

I use "compound profile" and "select extrusion path" often. I have been satisfied with the performance of these tools in V11 and haven't been interested in the new ones that have been added. As a matter of fact, I am still learning the ones that I have now.

**Date:** August 27, 2007 10:13 AM

**Author:** Wesley Hughes ([whughes@northstate.net](mailto:whughes@northstate.net))

**Subject:** Constraints

Henry, I tried constraints out, played with them. I don't think they would be useful to me. What I do is draw up one of my "Ideas". Everything is always changing, when I see a better way or when I see the way I was planning won't work. I have to make a change. This wouldn't work if I was constrained. I am going to keep constraints in the back of my mind in case I need them.

**Date:** August 27, 2007 11:59 AM

**Author:** Henry O. Hubich ([hhubich@comcast.net](mailto:hhubich@comcast.net))

**Subject:** Supposedly...

...Constraints, used correctly, make it easier to change a completed part: One merely edits a constraining dimension and the 3D object updates itself accordingly. But I personally find it challenging (i.e., dang near impossible!) to plan ahead carefully enough to take full advantage of this feature.

**Date:** August 27, 2007 12:57 PM

**Author:** Winston Mitchell ([Boise,Idaho](mailto:Boise,Idaho))

**Subject:** Alibre actually does that... It's a wonderful documentation tool but I find very inconvenient for investigational/conceptual drawing.

**Date:** August 19, 2007 07:51 AM

**Author:** Joseph Milanese ([csengineering@sbcglobal.net](mailto:csengineering@sbcglobal.net))

**Subject:** Geometric editing revisited

Since the flood of positive comments about constraints has not been forthcoming, I thought I would add a few more observations as to why a different focus for development is desirable for TurboCad.

Those who regularly read this forum will remember that the excuse for eliminating the visual basic development environment from TurboCad was the expense of including the constraints technology, which was licensed from D-cubed.

I have seen many complaints about the removal of this programming capability on this forum, and many requests from more recent users that programming capability be made more powerful and flexible. Although Visual Basic may no longer be the best way to implement this capability, there is a clear demand for improvement in this area. It was the ability to customize AutoCad that made it the market leader.

I don't believe I have EVER seen an actual request for expanded constraints. Why then was this pursued at the expense of other, more requested, features?

It was the success of SolidWorks, and the desire to be all things to all people, that led the management of IMSI to attempt to mistakenly crowbar parametric editing into TurboCad. In my opinion, TurboCad's layer based file structure, with entire assemblies contained in a single file, is inherently unsuited for parametric editing of 3D objects based on constrained 2D sketches.

In SolidWorks and other successful 3D parametric software, the basic file contains only a single part, limiting each file's complexity as well as the damage if that particular file becomes corrupt. In addition, the file structures of true parametric softwares themselves enforce a consistent use of 2D sketches and 3D model spaces; this has no analog in TurboCad, which lets you create 2D & 3D entities wherever you like. This must be a nightmare for programmers trying to keep track of whats going on.

When working on assemblies in SolidWorks, you are really looking at "reference files" (to use TCad/ACad terminology) that you can "reach in" and edit from the assembly file. Even with this basic structural advantage it is not always easy to predict what will happen when you start editing those parametric relationships. Now imagine taking all those relationships and parts, and combining them into one enormous file - what are the chances for file stability?

For these reasons, AutoDesk was correct to create a new program (Inventor) to compete with the parametric CAD softwares. But because AutoDesk's primary solid modeler is parametric, the development of AutoCad in this area has been slow. Making 3D design in AutoCad too easy would impact the sales of Inventor.

This is an opportunity for TurboCad! A non-parametric, non history-based 3D modeler that is AutoCAD compatible would be a great thing. Here are some tools that I would REALLY like to see:

1) Multiple-part facet editing. Many people have asked for this feature, describing it as a "3D-stretch" tool. Enormously powerful, and no constraints or history required.

2) Non history-based sheet metal unfolding. This is already implemented in other non-parametric software. How much more useful when you can work with objects that weren't created in a specific manner, or objects that were imported from other CAD systems.

3) Parametric-like capabilities can be incorporated into dimensioning. By grabbing a collection of facets and associating them with a dimension, that dimension can be made to drive the geometry in a way similar to a parametric dimension in a 2D sketch. The difference is in the way it is programmed; what you are really doing is implementing a very fast and convenient method of defining a facet editing operation that you expect to perform more than once.

The list could go on; the above ideas are lifted from Kubotek's KeyCreator software. Combining this approach with extensive AutoCad compatability seems like a good idea to me.

IMSI was right when they thought that TuroCad could be AutoCad with better solid modeling capabilities. But they were mistaken when they decided that the only way to improve solid modeling capabilities was to emulate SolidWorks.

**Date:** August 21, 2007 08:06 PM

**Author:** Jim Burwinkel ([theatre designer@sbglobal.net](mailto:theatre designer@sbglobal.net))

**Subject:** Geometric based modeling

Having just finished a project with Inventor and dealing with constrained geometries and separate part files--and detesting it--I would agree. It was not a project that really lent itself to that process very well (I do scenic design and exhibit design), but where complete AutoCad compatibility was required.

A more free-form and flexible solid modeling program--essentially the core of TurboCad--is like heaven. Adding the things you mentioned, as well as beefing up the drafting palette and giving the program a speed boost and it would be ideal. Like SketchUp on steroids.

As far as AutoCad capability goes, v14 is disappointing at best. I go back to 11.2 for reliable saves to dwg format.

Another plus is the flexibility of import/export formats in TCad. I used it as the universal translator for 3D formats into Inventor and AutoCad.

At the end of the day, I think it's just a more intuitive process in TurboCad. Get to the point of easy and reliable export of 2d geometry to AutoCad and truly hard to beat. That is one area where Inventor really blows the socks off TurboCad.

**Date:** August 24, 2007 05:22 AM

**Author:** Jonathan Glinn ([jon.glinn@raven-research.com](mailto:jon.glinn@raven-research.com))

Joseph, I'll go along with that. If I understand correctly you can do multiple-part facet editing in TurboCad (non history based of course - I never use constraints or the part tree). I have even used it with some success to do simple sheet metal unfolding although it does have its limitations. Scroll down this little lot if you haven't seen it already.

**Date:** August 24, 2007 11:56 AM

**Author:** Joseph Milanese ([csengineering@sbcglobal.net](mailto:csengineering@sbcglobal.net))

**Subject:** multiple-part facet editing

Jon, I read through the thread you indicated; Its very interesting and I will experiment with it. Thanks!

What I have in mind is to be able to grab facets on multiple 3D objects at once and relocate them at the same time. Right now you can only facet edit one object at a time (I think), although you can grab as many facets as you like.

If there really is a way to edit facets on more than one object at the same time, please explain.

**Date:** August 24, 2007 12:32 PM

**Author:** Jonathan Glinn ([jon.glinn@raven-research.com](mailto:jon.glinn@raven-research.com))

You're right there isn't a way to do several separate 3D entities at once as such. If, however, they are not touching each other you could 3d add them, do the edit then explode it once to get your separate objects back again. It might be useful in some situations. Jon

**Attachments:**

[facetselect.jpg](#) (178 kb)

[stretch.jpg](#) (123 kb)

**Date:** August 24, 2007 05:09 PM

**Author:** Joseph Milanese ([csengineering@sbcglobal.net](mailto:csengineering@sbcglobal.net))

**Subject:** Good suggestion Thanks, that will come in handy for some situations.

**Date:** August 30, 2007 08:07 PM

**Author:** robert tierney ([rotierney2@comcast.net](mailto:rotierney2@comcast.net))

**Subject:** Constraints, more or less

Hi Joe, Thanks for posting the thread and sharing how you work with TurboCAD. I visited your company website. Very interesting automated equipment. It's good to hear how TurboCAD can fit into real-world business applications. It is easy to get a sense of your passion for TurboCAD, and unfortunately, the frustration that comes with the passion. I don't use TurboCAD for business (making money with it, or losing time/money with it), but I do share the passion for the program. I have not upgraded to V14 Pro yet. My reasons are mainly due to V12 experience and, (for me) a lack of compelling new features in the mech add-on pack. My CAD use involves machine design too, so that is my focus and priority. At work we build factory machines with relatively simple-geometry fab & purchase parts combined in assemblies. All fab parts are detailed in dimension drawings and assemblies in 2-3 views, isometric, sections/details. Most are printed in black & white, PDFs are used quite a bit.

At work I use SolidWorks 99. I will be upgrading to newest version when the timing is right, but I am in no rush. I am still amazed at the amount of industrial-strength features that are found in this 8-9 yr old program. Of course it was \$4k-\$5k new and the annual maintenance fee (if paid) would be more than the price of TurboCAD (today's price). But out of the box, at the start of the program, they packed so much into it and it worked as advertised. Here are some examples-

1. parametric part and assembly modeling with 2d and 3d constraints
2. collision detection (the modeled parts stop when they collide)
3. mass properties with density, mass properties of assemblies (Cg for example of an assembly of different density parts)
4. coloring of individual surfaces (no materials, but we don't typically make photorealistic parts & assemblies)
5. simple 3d assembly motion testing/checking of design intent (move one part and see how the model reacts)
6. Array of hole & cut/boss features, easily edited, mirror image of holes/cuts/bosses, mirror image parts that update as original changes.
7. equations, temporary section views of models.....
8. effortless part and assembly manipulation (rotating and spinning modeled parts)

It is based on ASICS ver 5. It's not perfect. 2d drawing is primitive compared to TurboCAD. The annual upgrade cost is high. It's focus is industrial 3d design.

Like IMSI, SolidWorks purchased 2d constraints from D-Cubed. They also purchased 3d constraints, and collision detection from them.

I am no programmer. My opinion is based on my end-user experience with the different CAD programs. It seems to me that with TurboCAD, the development of the program and new features has, in general, not been done as well as (more expensive) programs or even done well in some cases. The bigger companies just have more people and money to throw at development. In general, I think they end up with a more polished product. The reason I mention SolidWorks Ver 99 is that the feature set sold basically works as advertised out of the box.

I think we have all experienced the difference between being offered features to entice sales and the execution of the features by IMSI. For example, a new interface would not have made my top 20 wishlist, but if they want to include it, OK, I'll take it. If the offer was made differently such as "here is a new interface, but it will put the whole program into a tailspin", I think I would decline the offer. My point is that the desire to have good new useful features is not a bad thing. We should encourage IMSI to compete feature-wise and compete well. They, in turn, should put out features that the market wants at reasonable quality & stability. The marketplace will decide how well the deal is working.

I do prefer the design method where I can create parts with basic features in quick fashion, then edit and tune up the part as needed. Having a 3d model assembly update and retain assembly intent and have 2d drawings & dimensions update is a real productivity boost.

If I can do it with parametrics, fine. If I can do it with feature based editing, that's OK too as long as I don't have to go back and edit the assembly or edit the 2d drawings or edit the dimensions.

I would like to have 3d constraints (or feature-based constraints at the assembly level). I think it can be one of the most time saving & powerful features of a 3d program. I think it is a feature that could turn TurboCAD into a real mid-range competitor. It would also place TurboCAD in a relatively unique position of being a hybrid/flexible type program, yet offering powerful assembly features. If it only worked in "assembly mode" (for stability reasons) such as assemblies with blocks or Xref files , I could live with that. If I had to buy it separately as an add-on, I would do it, as long as it wasn't one step forward and two steps back. Would I want it in TurboCAD at the expense of sinking the program? No.

I'm sure it is not easy for IMSI to make TurboCAD be the jack of all trades program. What I would like to see is in the program is different from others. I do respect the fact that that there are many different user needs of the program. I would like to get back to the scenario where TurboCAD users are fanatics and sell the program by word of mouth and demonstration. I would also like to be able to say that my latest version of TurboCAD Pro is Industrial Grade.