Final Project – Design and Build a Prototype Part or System
Part 1: Define your research
Assigned: Wednesday, March 28
Due: Wednesday, April 4

Abstract:
What does CNC bring to the table? This is one of the central and critical questions we are asking in this course. The computer is not a panacea for fabrication. Indeed it is more commonly used as a simple timesaver or work-saver in producing the same objects that we more commonly produce by manual means. In perfect evidence is our own laser cutter - the most widespread use of which is to quickly, and without the pain of manual cutting, produce layered contour site models in chipboard. This is certainly a useful application of the technology, but hardly an innovative one.

What does the computer bring to the table? Design offices like Frank Gehry and SHoP have shown us that there is possibility in computable form and process that is far greater and projects a new potential for architecture than traditional means of production and workflow. But even they are only scratching the surface. In fact we all are, from the wildest formal conditions to the most banal mass-production strategies. We stand, however, on the threshold of new approaches in which, if we are able to see beyond the everyday, or perhaps stare right into it, we may find a potential to fabrication and material processing that strikes at the heart of what this technology can achieve. I cannot tell you what this is, because I do not know. Nor do Frank Gehry, Asymptote, Gregg Lynn, SHoP or any other – yet. The technology is too new, and its uses are not fully developed. It is only through experimentation, trial and error, and a little bit of risk (and frustration) that we will discover what it can really achieve. Frank Lloyd Wright, Le Corbusier, Walter Gropius, the Eames, … – they were the pioneers of their time – wrestling with many of the same questions – and potentials – we search for today. Learn from them!

What does the Computer bring to the Fabrication Table? This course could be just about getting things made, but if it were it would be missing an opportunity that is rarely found – to really question a tool, harness a process, and explore an idea.

The Task:
**Design and Build a Prototype Part or System.**
The final project for this course asks to you take an *attitude* – an agenda – with regard to design and fabrication. What can the application of this technology be about? This project should be something original, from your own design mind. It should innovate upon the themes that we have discussed throughout the class, and upon the materials that we have covered. It should also specifically consider the relationship that the computer, as a *tool*, has to the act of fabrication, a *process* – working from what the computer, or numeric control, offers *uniquely* to that process.

The product of your work should be a prototype – something suggestive of an approach or a larger idea than a simple one-off artifact of design. The object of fabrication could be a single part, or it could be the germ of an entire system – of construction, fabrication, cladding,
structure, detail, ornament, joinery, …. The only requirement is that your product has a specific architectural or industrial meaning and a specific and practical use.

As with Project 4, the closer that you can get to real-world scale and real world materials, the better. Given the limitations of our machines, and the sometimes-extraordinary costs of real materials, this is not always possible, but you should at least be conscious of the role of both material and scale in what you produce, and how the machine produces it.

Getting Started:
To begin your work, Part 1 is simply to define your research. Over the next week, brainstorm and put some ideas together. No explicit fabrications are required, though you may use your work on Project 4 as a vehicle to begin thinking about your research. The goal for Part 1 is just to have a clear research idea and the beginnings of a strategy for how to achieve testing it.

There are three general approaches to suggest for this project, though others may be possible:

1. Start from a representational idea, and find a way to make it. This is analogous to the working methods of Frank Gehry - working from a representational model back and forth through the computer, ultimately using numeric control analytically to realize the form.

2. Start from a Numeric or Geometric idea, and find an expression for it. This is closer to the work of Greg Lynn, or SHoP, though it also has strong precedent in Wright and Le Corbusier. These methods may also take advantage of "constraints-driven" and "generative" approaches achievable in CAD/CAM or through various computer-programming paradigms.

3. Create a custom fabrication solution to a particular design or fabrication problem. This might stem from a linkage to your Studio work – using CNC to realize a specific part of your design – or it might be something more hypothetical, related to some research you are working on elsewhere.

Other approaches may be just as valid, and please come speak with me if you have thoughts that you want to share or get opinions on. I am open to almost any investigation here. The only requirement is that it be a clear research idea that you can reasonably analyze, test, and produce through fabrication.

Finally: Be bold and take an attitude. The technology of CNC, and for that matter the computer, is still very young, and very unresolved, within the profession of architecture. It is only through bold testing and experimentation that we will ever push these technologies toward their meaningful expression and application in our industry.

Keeping on Schedule:
Part 1 is to define your research – we will discuss these in class along with Project 4.
Part 2 builds a prototype(s).
Part 3 is your final product.