

Wealth, Innovation, Design, & Entrepreneurship **(WIDE)**

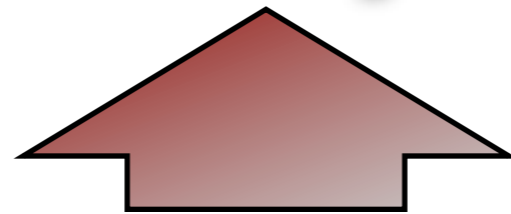
Prof. Bruce Jacob

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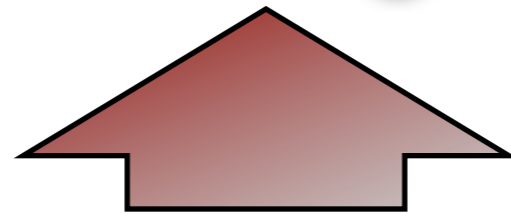


The **WIDE** Agenda

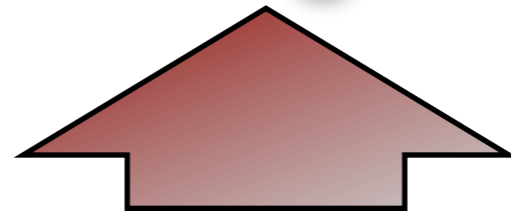
all individuals in society become wealthier



economic growth



innovation & good design



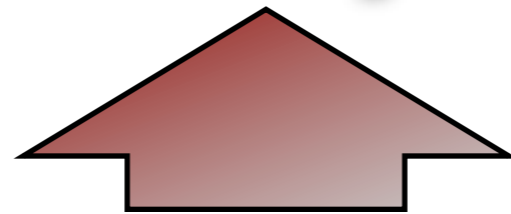
entrepreneurship

History Lesson: *What Was and What Will Never Be*

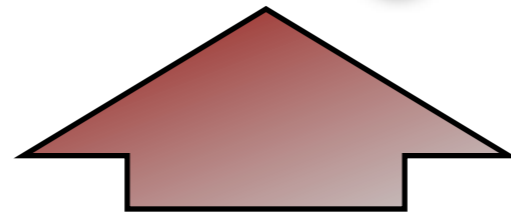
[... and, yes, that is an oblique Led Zeppelin reference ...]

The **WIDE** Agenda

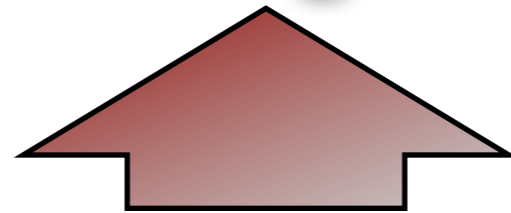
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The **WIDE** Agenda



Wealth



Not Wealth

The **WIDE** Agenda



Wealth



Not Wealth

The **WIDE** Agenda



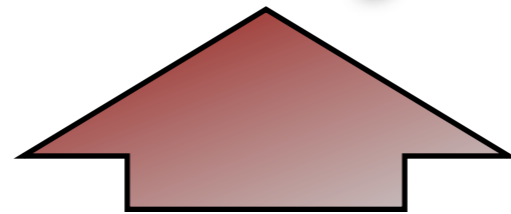
Wealth



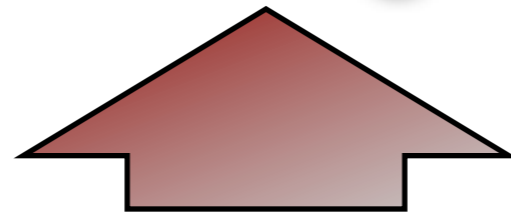
Not Wealth

The **WIDE** Agenda

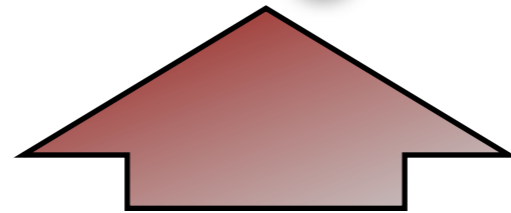
all individuals in society become wealthier



economic growth



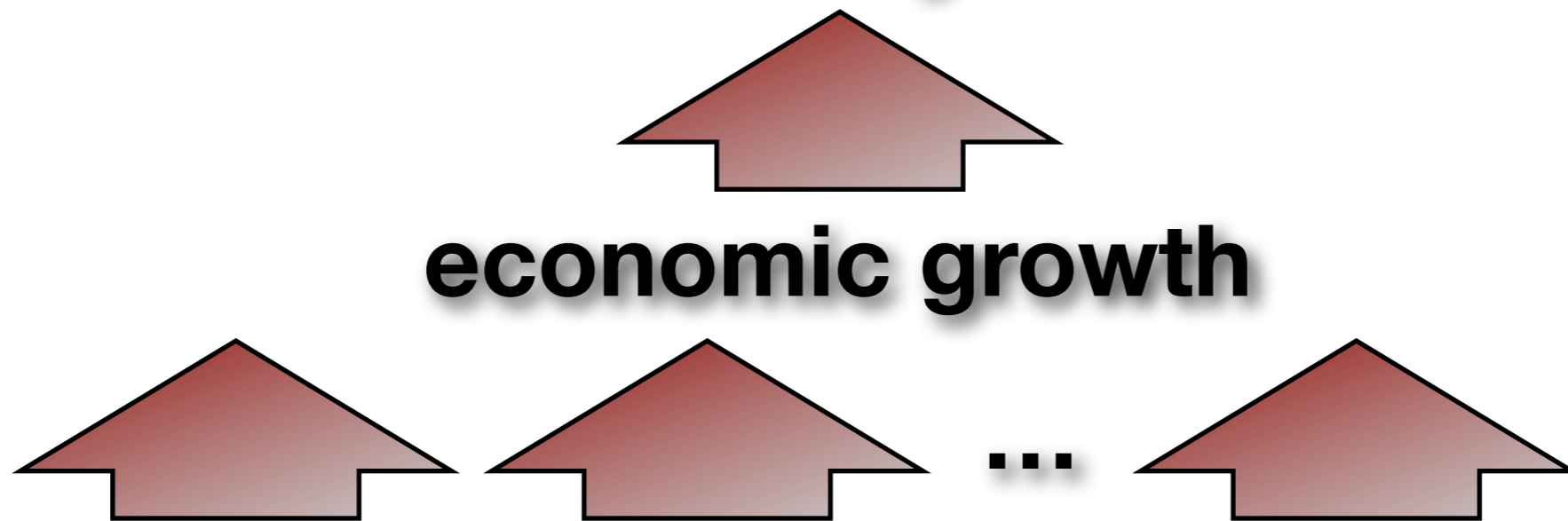
innovation & good design



entrepreneurship

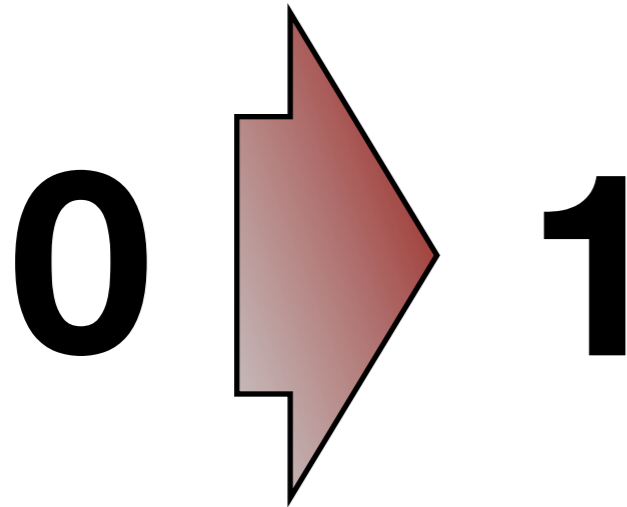
The **WIDE** Agenda

all individuals in society become wealthier



**but wait – isn't economic growth fueled
by more than just innovation and design?**

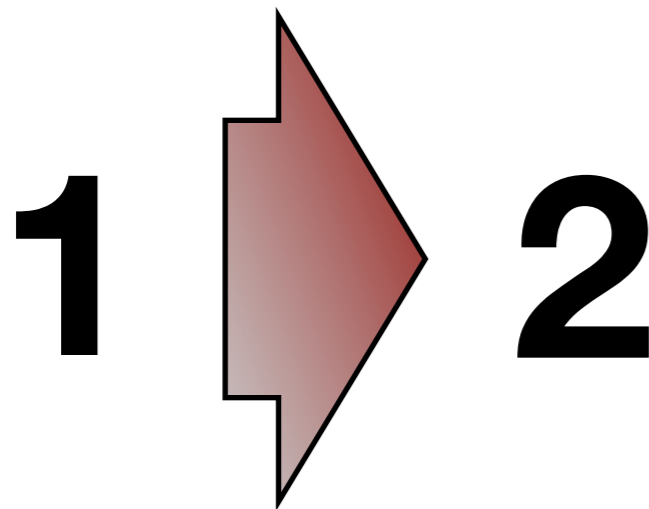
Economics of 0, 1, 2



Fundamentally, there are (*at least*) **two types** of economic growth:

1. giving people something they don't already have, and

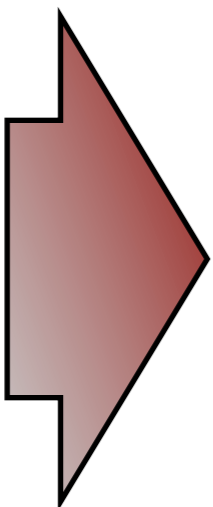
2. giving people more of something they do already have



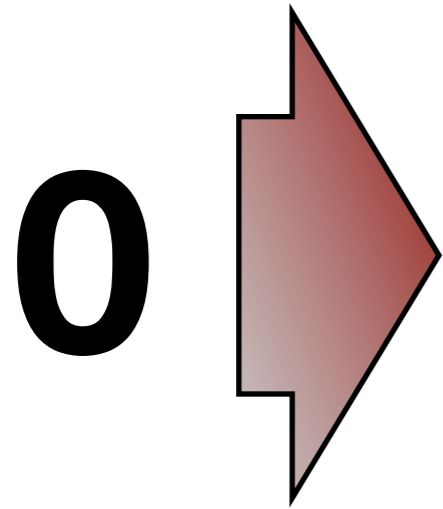
My claim: 0->1 is significantly more transformative than 1->2

Economics of 0, 1, 2

0  **1** Food, housing, communications, transportation, medical care, etc.

1  **2** Food, housing, communications, transportation, medical care, etc.

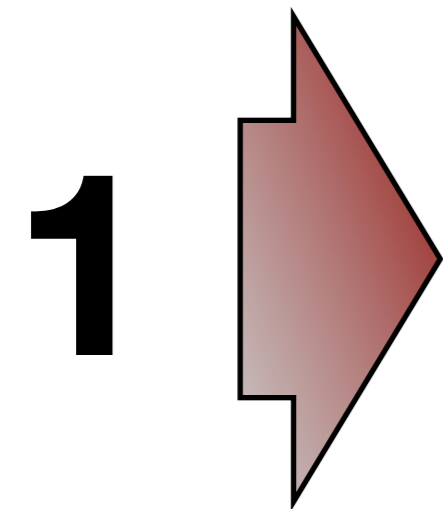
Economics of 0, 1, 2



0

1

Food, housing, communications, transportation, medical care, etc.



1

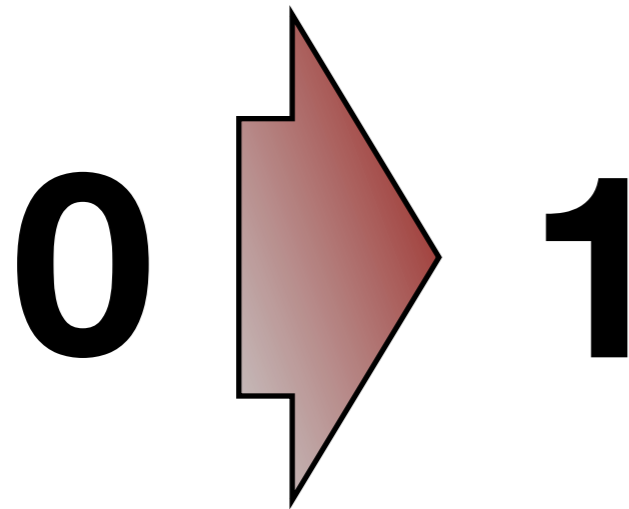
2

Food, housing, communications, transportation, medical care, etc.

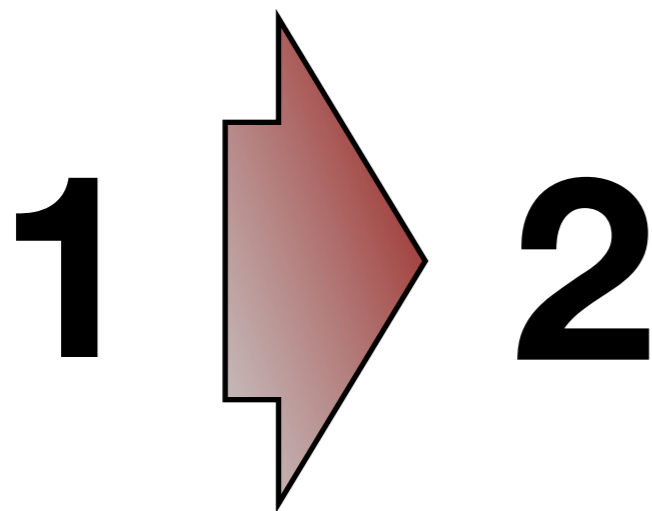
Better

More

Economics of 0, 1, 2



***Economics of BETTER:
Transformative
Innovation-driven
ALL in society benefit***



***Economics of MORE:
NOT transformative
Optimization (cost)-driven
Optimizers benefit***

It's All About Innovation ...

“Innovation and trade: the ultimate engines of growth.”

—*The Economist*, Oct 3, 2009

“We have to choose to do what past generations have done: shape a brighter future through hard work and innovation.”

—Barack Obama, Sep 22, 2009

(ASEE’s “Obama Touts Innovation Agenda At New York Community College”)

“In the new knowledge economy, innovation and knowledge are the most important factors driving economic growth.”

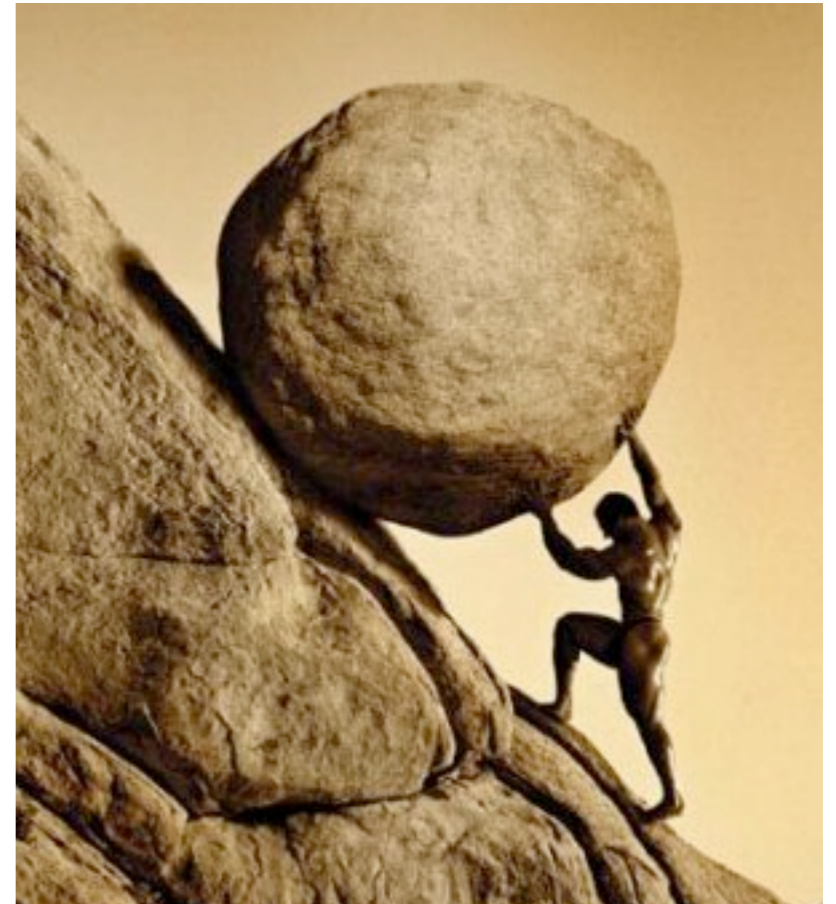
—Progressive Policy Institute: *The Innovation Economy*, Oct 2003

“Innovation is the heart of economic recovery & future prosperity.”

—*Roll Call*, Nov 20, 2008

... But, Boy, Is Innovation Hard

- “In an era when most technology outfits have tightened their belts to adapt to a slower-growing market, one company stands out for forging ahead on innovation: Apple Computer.” (*BusinessWeek*)
- “Big companies are losing their ‘A’ players, and they’re struggling to attract ‘B’ players. In an industry where everything is about people, large tech companies are in trouble because they are losing the talent war. And keep in mind, an ‘A’ player in an organization can usually produce the same results as three ‘B’ players.” (*VentureBeat*)
- “Lots of companies have tons of great engineers and smart people. But ultimately, there needs to be some gravitational force that pulls it all together. Otherwise, you can get great pieces of technology all floating around the universe. But it doesn’t add up to much.” (*Steve Jobs, on innovation*)



I Would Add ...

- Everyone in the US wants to make **money**, not **stuff**
(manufacturing for most of our stuff happens elsewhere)
- Can really only innovate at the **stuff** level (making new stuff, better stuff)
- Innovation at the **money** level only benefits the innovator
- Our lack of a US manufacturing base means several things:
 - We are forcing (and teaching) the rest of the world to innovate
 - We're not innovating any more as a society — just scattered outliers
 - Our economic growth (wealth, std of living, etc.) is falling behind others

What is Design? What is Innovation?

- Can't define it, but you know it when you see it ... 😊
- Close interaction with **burnout** phenomenon in start-ups
- An inability to eat, think, sleep, care for one's self while technical problem remains
- Much “innovation” is just good design (... interesting)
- Requires staring at one problem for extended period (much like Ph.D. in that regard)



Image search for “burnout”

Let's think more on that last point ...

Innovation and design: Requires staring at one problem for extended period

Academia: Attention flits from topic to topic in a scheduled, often frenetic pace.

Semester concept is both arbitrary and contrived/artificial — false sense of progress

(innovation recognizes no schedule)

We're training you to be poor designers.

But, wait, there's more ...

Students calculate the effort needed to get the desired (or lowest acceptable) grade.

You do the minimum work required.

We (unconsciously) **train you** to do this.

In design, anything less than full attention = failure.

Put Simply

Design & Innovation — what it demands of you:

- Focus: 100%
- Time: **extended** period

The Academic Environment — what it demands of you:

- Focus \ll 100%
- Time \leq 1 semester (typically, \leq 1 week)

Conclusion: *Education is counter-productive at the society level?*

It Has Been Borne Out in Reality

- *Innovation and design requires staring at one problem for extended period*
- Contrast that with academia (undergrad in particular):
 - Attention flits from topic to topic in a scheduled, often frenetic pace
 - There is neither time nor incentive to spend more than a small fraction of focus on any given topic



Larry Ellison



Bill Gates



Stephen Spielberg



Richard Branson



Michael Dell



Steve Jobs

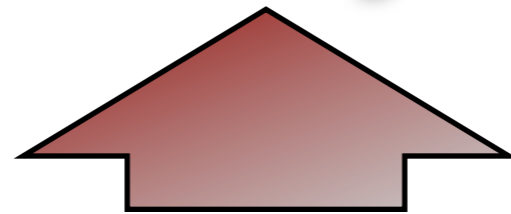
Is it any wonder that SO MANY successful entrepreneurs/innovators dropped out of school?

I Think Academia is to Blame

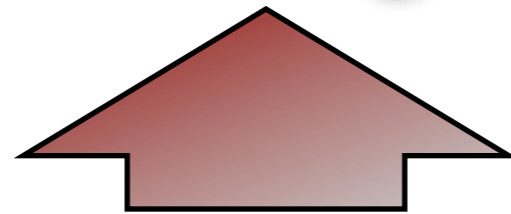
- 1700s – 1900s: rise of wealth
- 1940s/50s: rise of **education**
- 1960s/70s: stopped innovating
- 1980s/90s: stopped m'facturing
- 1980s on: decline of wealth

The **WIDE** Agenda — **Your Part**

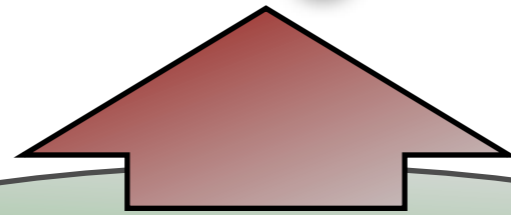
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economic growth



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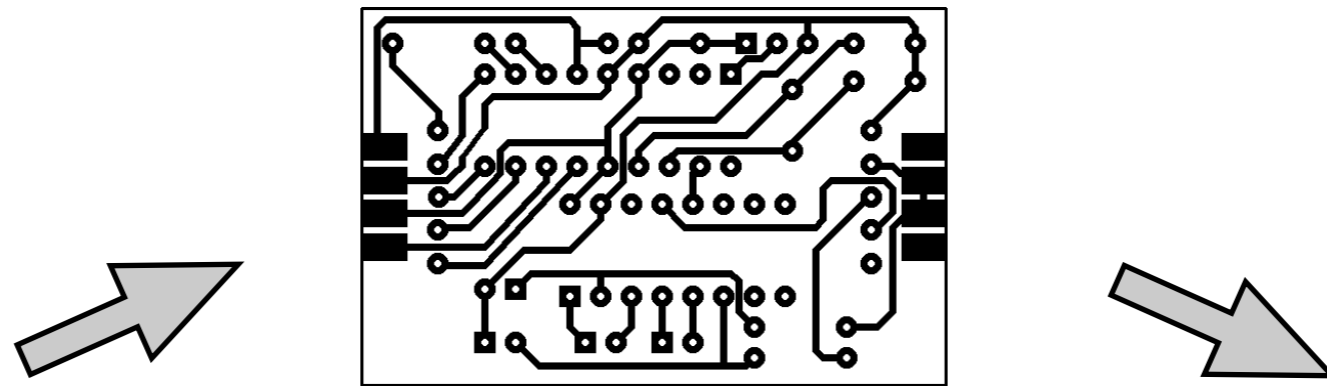


entrepreneurship

Important development in last decade:

Manufacturing as a Service

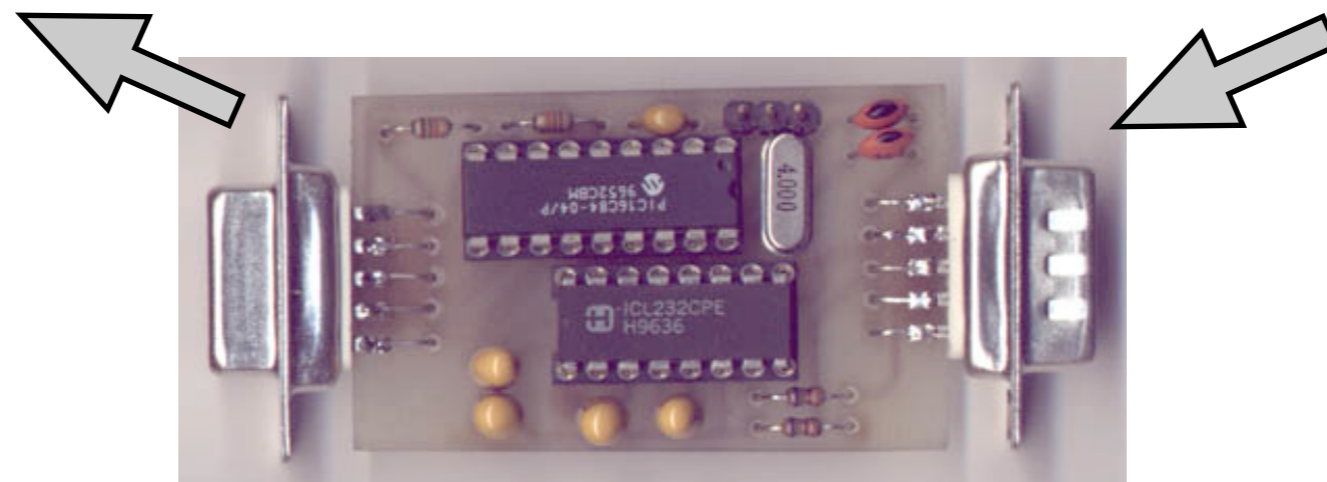
The Basic Idea



Design Blueprint



Factory

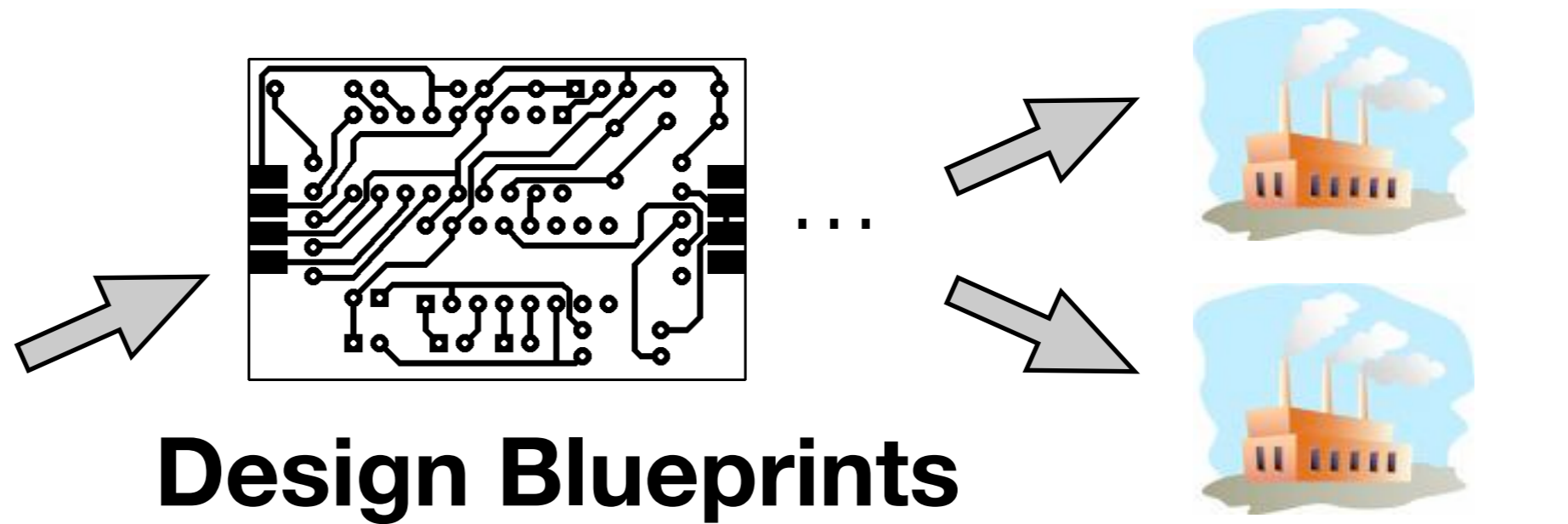


Manufactured Device



You

The Basic Idea



You

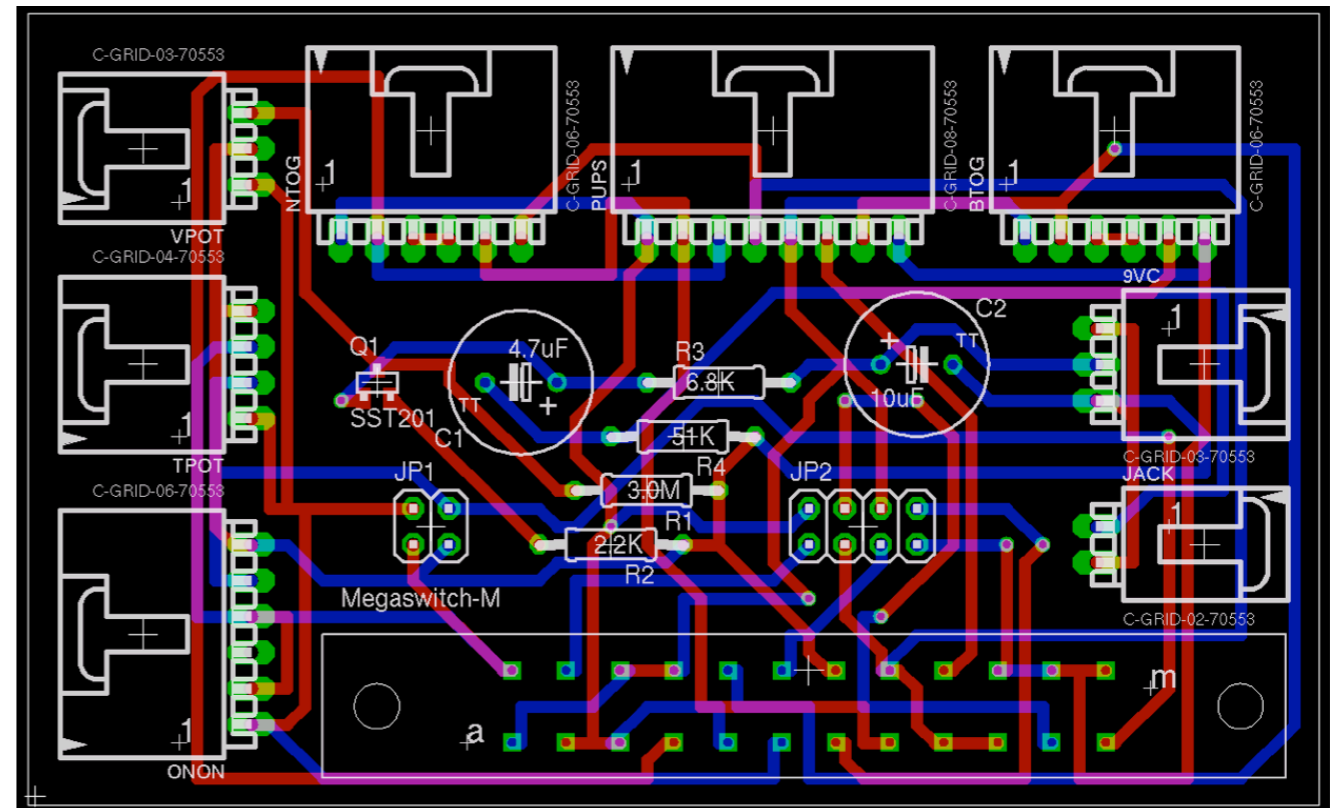
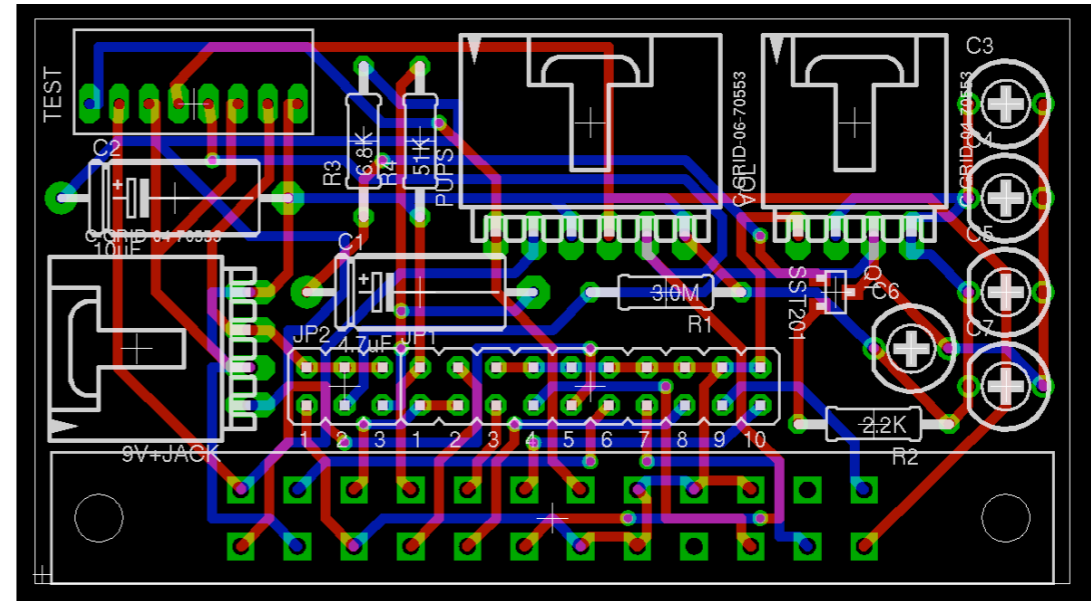
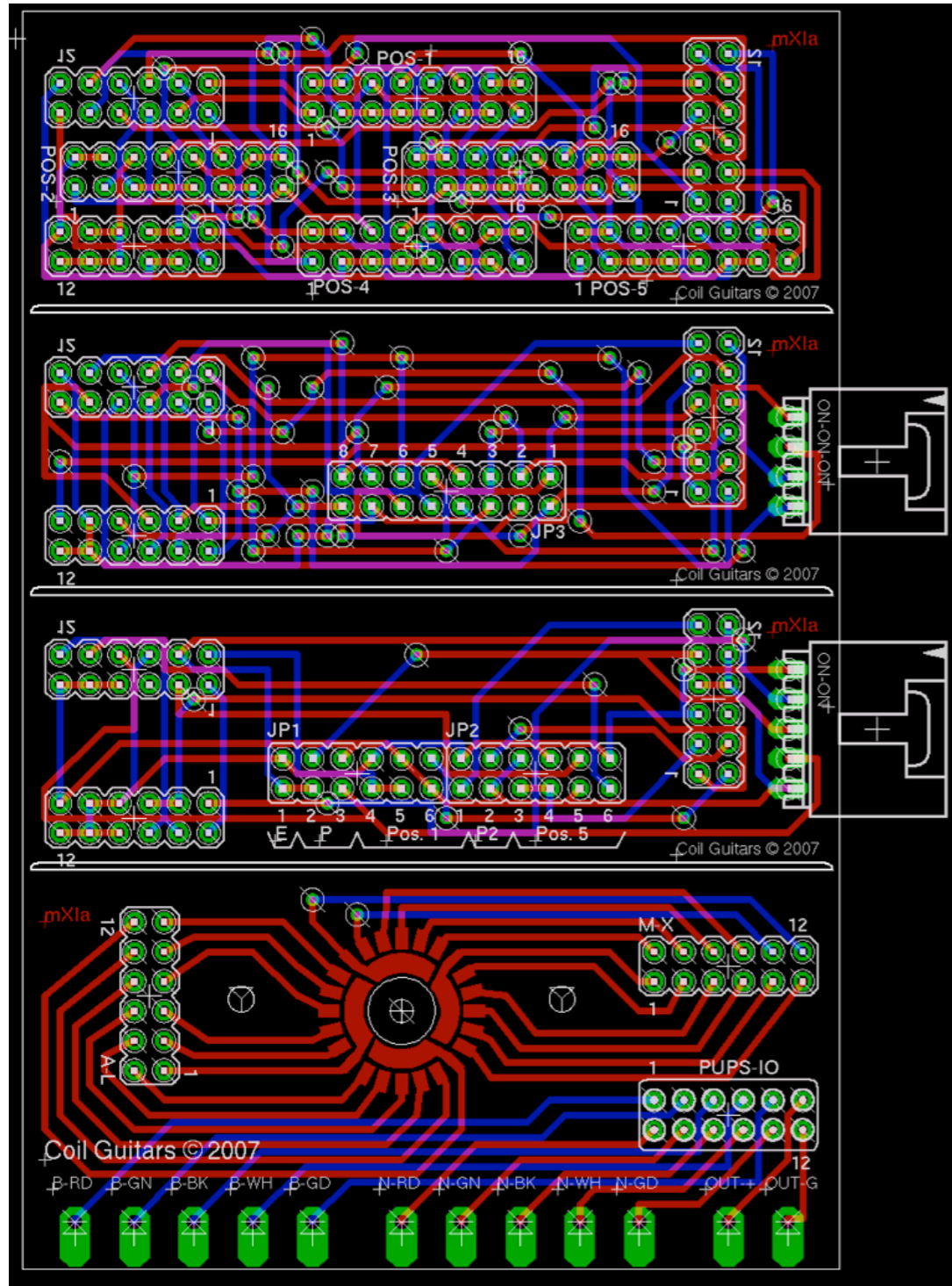


Manufactured Device

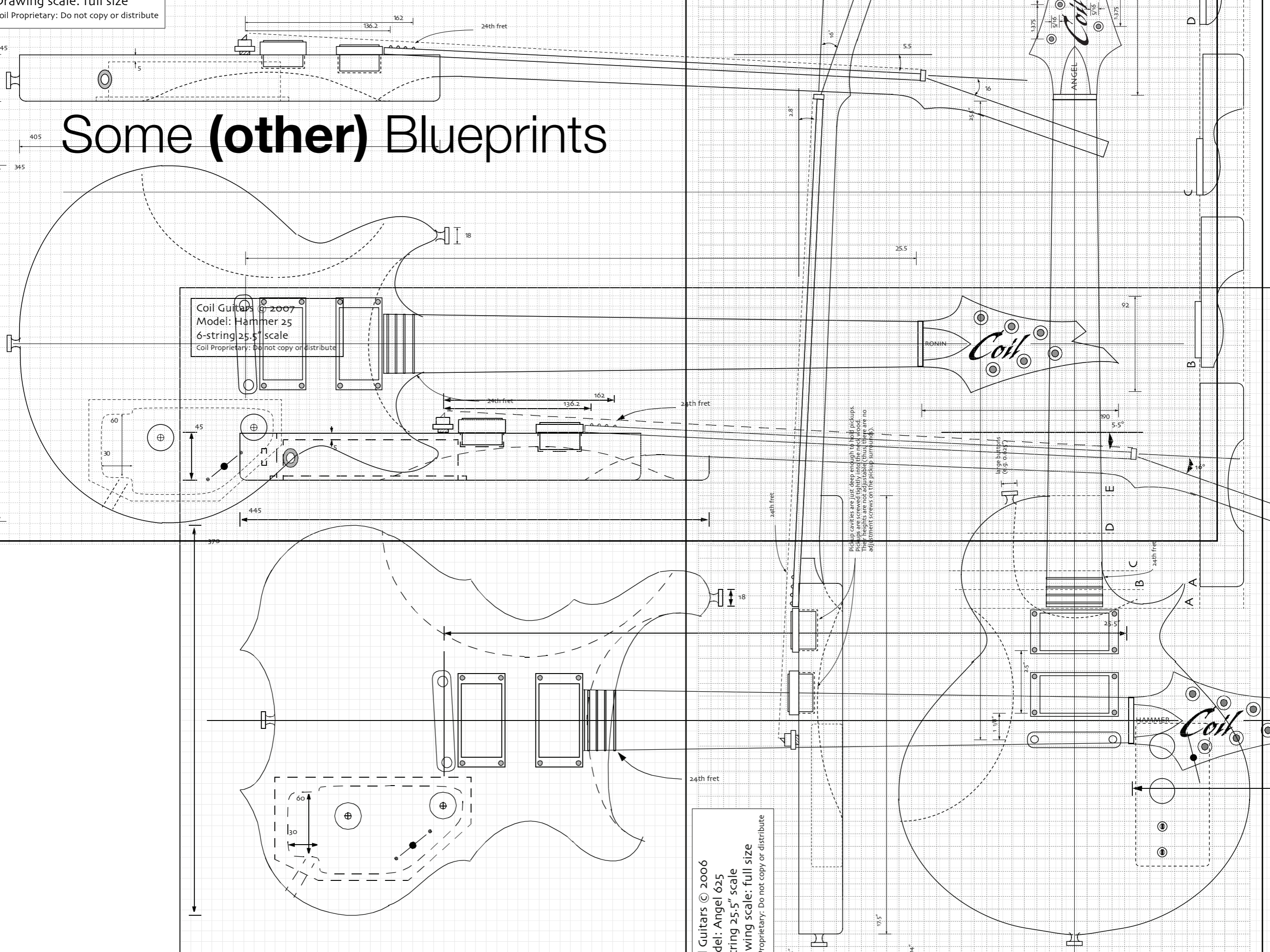


Assembly

Some Blueprints



Some (other) Blueprints



Coil Guitars © 2007
Model: Hammer 25
6-string 25.5" scale
Coil Proprietary: Do not copy or distribute

Coil Guitars © 2006
Model: Angel 625
6-string 25.5" scale
Drawing scale: full size
Proprietary: Do not copy or distribute

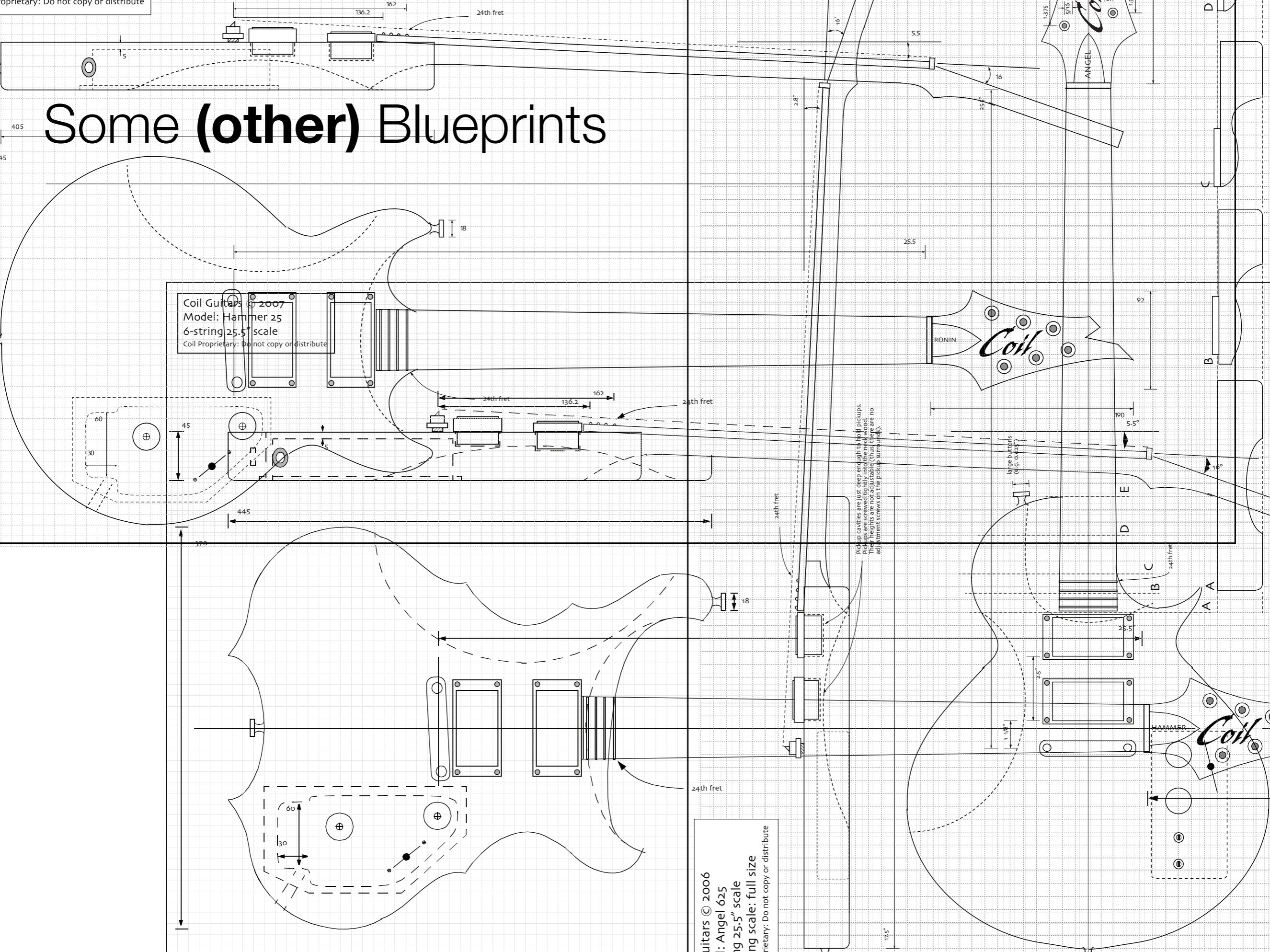
pickup cavities are just deep enough to hold pickups.
pickups are screwed tightly into the neck wood.
pickup heights are not adjustable (thus there are no
adjustment screws on the pickup humbuckers).

large bitraps
(#15-0.025)

ANGEL
Coil

RONIN
Coil

HAMMER
Coil



Pros & Cons

- Can't Possibly compete with big companies
- Might fail
- Can't afford it
- Window of opportunity?
- Idea already proven in marketplace (shareware, boutique electronics)
- Win/win situation (even company failure is good résumé material)
- Low risk/reward ratio
- Start soon

Bottom line: Do it for yourself, your country, the economy, whatever ... just DO it.

Questions?

(thank you for your attention)

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... or just Google “bruce jacob”



BACKUP SLIDES

The **WIDE** Agenda

Innovation creates Wealth

For you

For others (beneficiaries of your innovations)

For the economy

Wealth is **not** like energy;
it obeys no laws of conservation

Teach Innovation Despite Scheduled Frenzy?

Necessary Elements:

- Look at one problem for extended period (years?)
- Personal investment in outcome (reward, pride, etc.)
- Time commitment need not be large on per-week basis
- Need to see **real examples** of both success and failure
- Must be guided by innovators (not academicians, not MBAs)
- Failure is acceptable (grades)



Olin College, est. 1997