Prototype PCB vendors

- Requirements: **CHEAP, GOOD, FAST**

- Don't want to pick just two of these.

- Boiled list down to OSH Park and two Chinese sources. Only OSH Park delivers all three attributes.

- But in addition, OSH Park is alone in supporting and encouraging slots so you can get multiple little boards from one order.

OSH Park

- Online at http://oshpark.com
- This is a friendly, easy to use site that does only one thing, but does it well.
- Basic info can be browsed.
- Order-specifics require a user account, but that's easily set up.
- Under the covers lies **heavy automation.**
- Many formats are supported, not just Eagle.

OSH Park ~ Welcome - Mozilla Firefox

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OSH Park
An electric ecosystem

Welcome to OSH Park!

This is a community printed circuit board (PCB) order. We take designs from lots of people, put them all together on a panel and then order the panel from a fab.
Since we're all splitting the panel setup cost, this lets us make circuit boards inexpensively.

This service grew out of the DorkbotPDX PCB Order run by @laen and now comprises of a two-layer panel every other day, a four-layer panel every three weeks and a periodic two-layer medium run service for people needing more than 150 square inches of board.

Get Started Now

Our boards are lead free, and amazing quality. Take a look at some of our customer's projects on Flickr or check out the specifications.

Designed and developed by Sociable Limited.

Designing for OSH Park production

- Two or four layers supported, any size an affordable Eagle license handles

- DESIGN RULES

  - 6 mil minimum trace width

  - 6 mil minimum spacing

  - At least 15 mil clearances from traces to the edge of the board

  - 13 mil minimum drill size

  - 7 mil minimum annular rings

Designing for OSH Park (2)

- Download and use the OSH Park Eagle design rules file.

  - This is essentially a script that checks your board.

  - It finds and flags potential problems, such as too-close traces, insufficient clearance, etc.

  - Note that component names and the like on the silk screen layers overlapping solder mask layers will create a lot of warnings: Don't sweat these.

Designing for OSH Park (3)

- Specify a board outline
  - Dimensions layer
  - Does not have to be a rectangle: could be a french curve if that's what you desire!
  - Pricing governed by the size of a rectangle that surrounds the outline you specify, however.
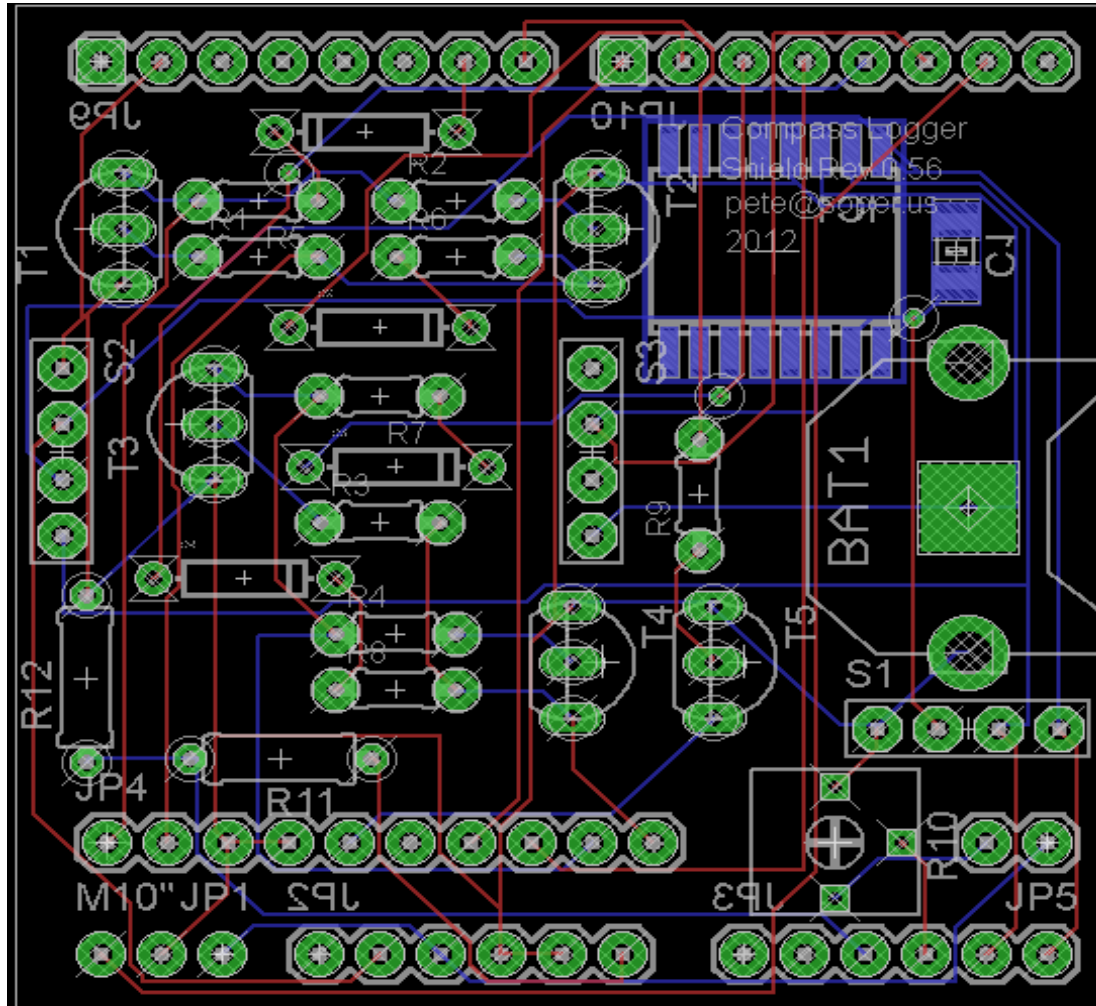
OSH Park order process

- Create a user account
- Follow the "get started" link
- Upload an Eagle .brd (board description file)
- Review vendor's take on what you sent and approve it
- Pay for your order
- That's it: about two weeks later boards arrive

Speaking of Price: 2 Layer Details

- OSH Park charges $5/square inch for three copies of your board.

- Example 1: board is a 2x2"
  - You get three copies of this board for $20
  - Actual cost is $1.67/square inch of PCB.

- Example 2: Nine 1" round boards surrounded by slots in a 3x3 matrix inside a 3.5x3.5" square
  - 3.5 times 3.5 times $5 = $61.25 for 27 1" round boards

- Larger quantity runs offered for $1/square inch.

What a board looks like in Eagle

What the order process looks like

- After you upload your board file the web site renders it as a set of Gerber files with a viewer usable by your web browser.

- Hi-res images of your design are shown so you can confirm everything, starting with the board outline.

- Your board is set up as a 'project' in your account with reference info that looks like:
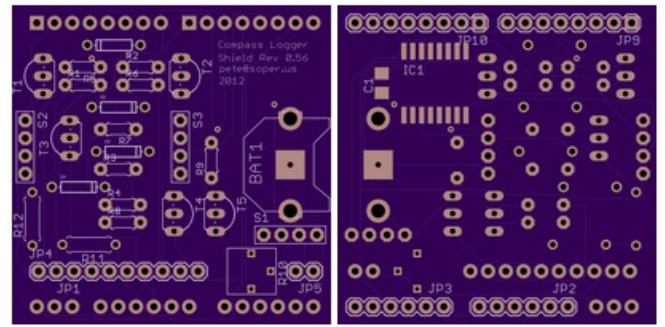
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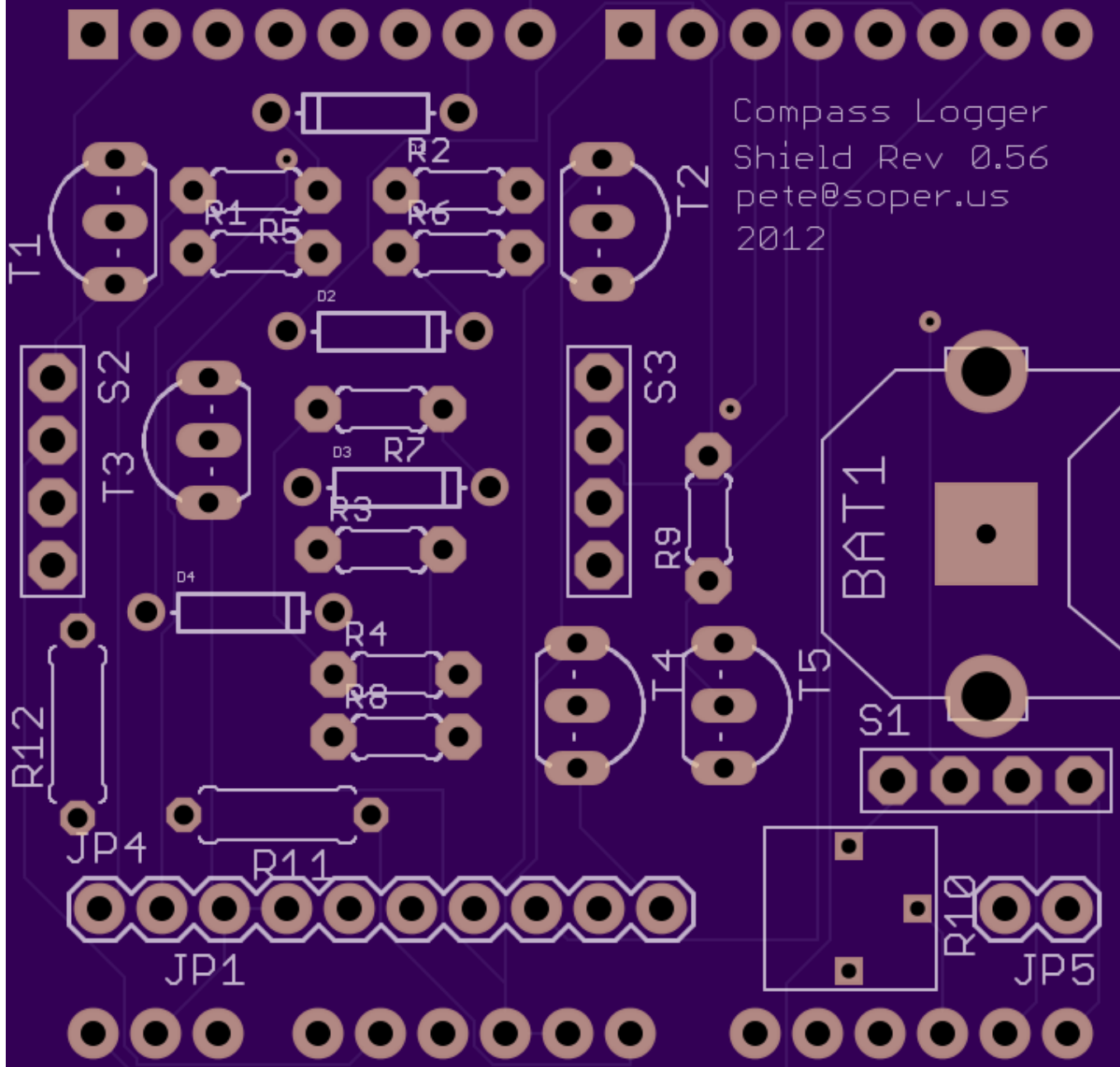
OSH Park
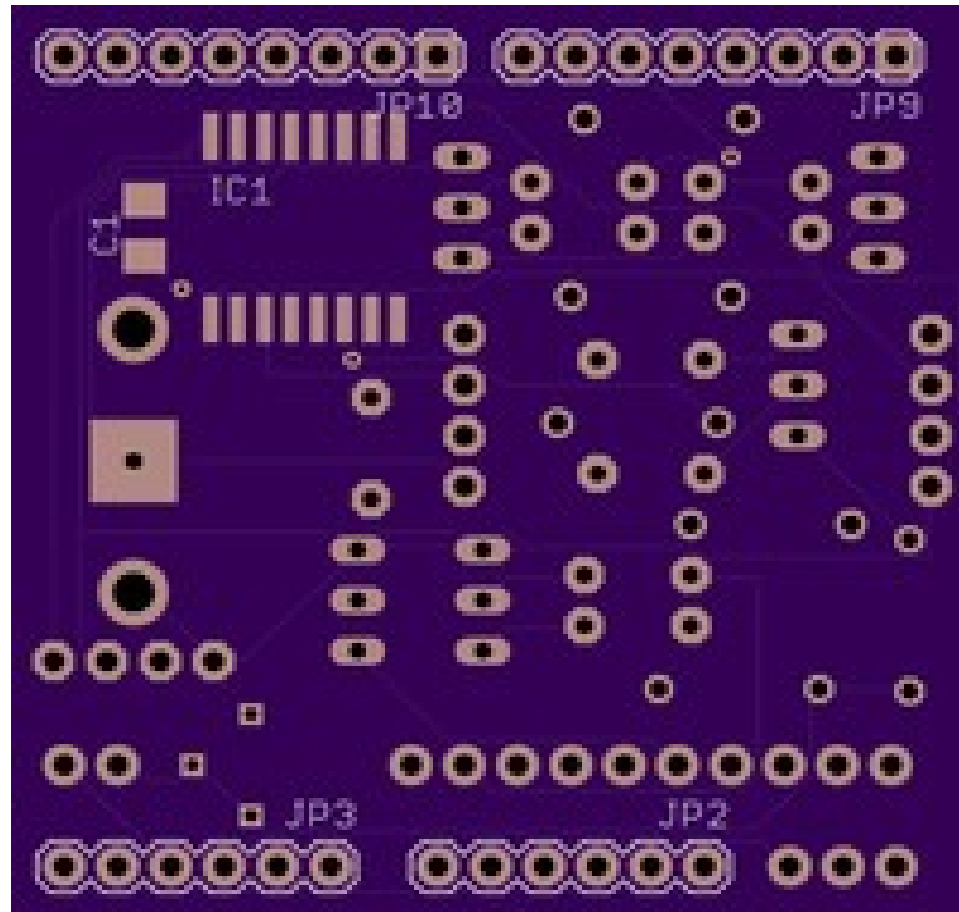## About petesoper

Your current projects

CompassLogger56

- **Current state:** APPROVED
- **Dimensions:** 1.8x 1.8 inches (45.72x 45.72 mm)
- **Orders:**
  - Ordered on November 26th, 2012 View order.
- **Actions:** Delete Order now

Compass Data Logger glue board rev .056

Compass Logger
Shield Rev 0.56
pete@soper.us
2012

OSH Park Order Email Flow

- Msg confirming payment details, with an estimate of the next panel design assembly

- Msg confirming assignment to panel design, explanation that the panel will ship when it's filled from orders.

- Msg confirming panel design completion and shipment to PCB supplier.

OSH Park Order Email Flow (2)

- Msg confirming receipt of PCB panels.
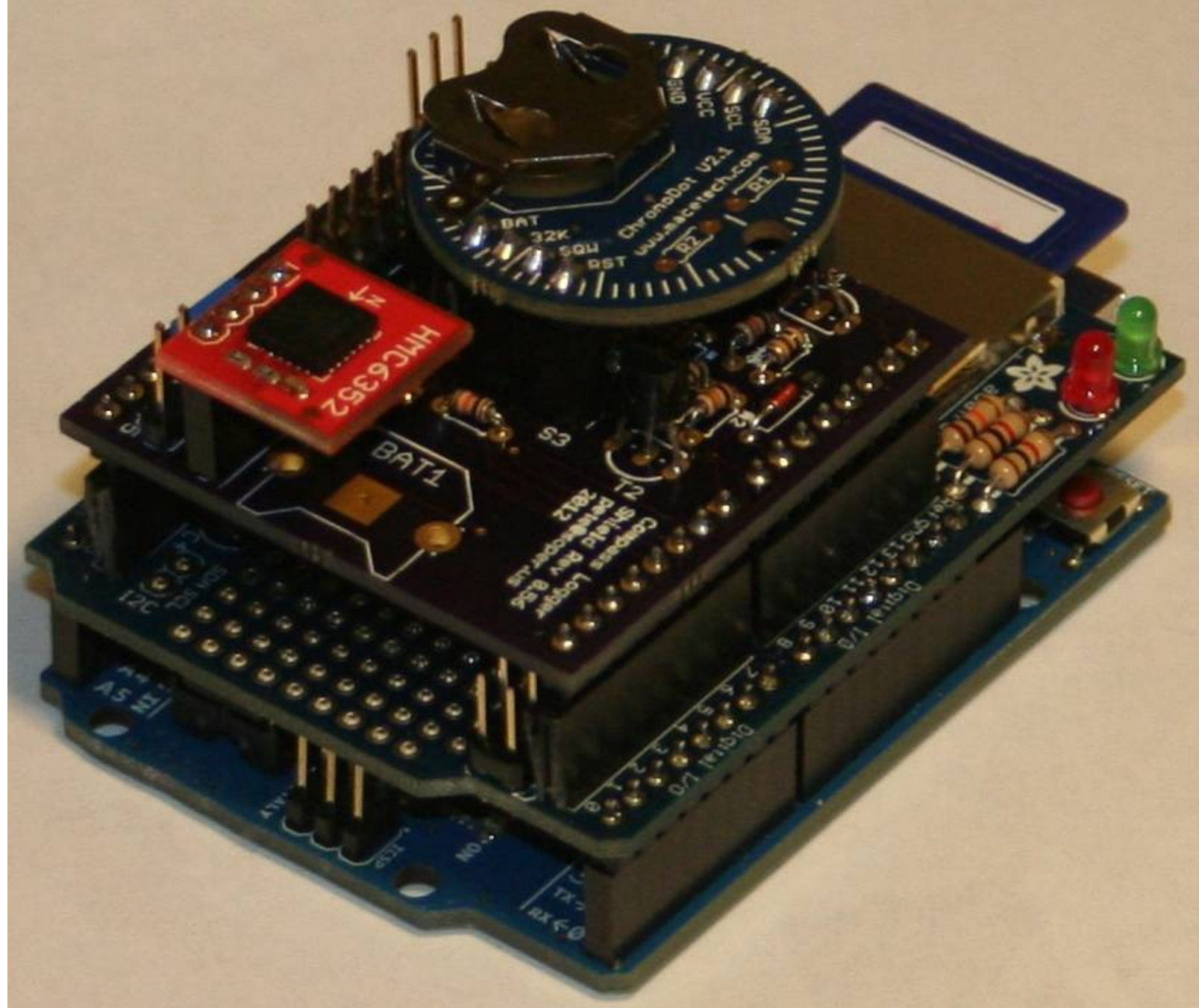- Msg of shipment of your boards with USPS tracking number.

  Your boards then arrive in your mailbox!

- Current lead time estimate is 12 days, repeated frequently in forum msgs.
- My first order arrived 10 days after I ordered (Sunday night until Friday after next).

Example Boards

- ## What do OSH Park PCBs look like?

  - ### Several examples here: http://www.flickr.com/groups/oshpark/

  - ### My board is the on next slide. It's under the red compass and blue round clock/calendar boards, above an Adafruit data logger, which his above an Arduno Uno.

OSH Park ~ Pricing and Specifications - Mozilla Firefox

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OSH Park
Pricing and Specifications

Pricing

There are currently three types of orders:

The standard 2 layer order

$5 per square inch for three copies of your design. For example, a 2 square inch board would cost $10 and you'd get three copies of your board. You can order as many copies as you want, as long as they're in multiples of three.

Orders are generally 2 to 3 times a week, and have a turn time of about 12 days. They can be ordered on OSH Park.

The 4 layer order

$10 per square inch for three copies of your design. For example, a 2 square inch board would cost $20 and you'd get three copies of your board. You can order as many copies as you want, as long as they're in multiples of three.

Orders are generally every 3 or 4 weeks and have a turn time of about two weeks. They can be ordered on OSH Park.

The medium run order

Orders are generally 2 to 3 times a week, and have a turn time of about 12 days. They can be ordered on OSH Park.

The 4 layer order

$10 per square inch for three copies of your design. For example, a 2 square inch board would cost $20 and you'd get three copies of your board. You can order as many copies as you want, as long as they're in multiples of three.

Orders are generally every 3 or 4 weeks and have a turn time of about two weeks. They can be ordered on OSH Park.

The medium run order

$1 per square inch, 150 square inch minimum. You can have as many different designs as you want, as long as each is ordered in a multiple of 10 boards.

These boards cannot be ordered directly through the site. You should send your designs directly to pcb@laen.org to be included.

Specifications

- All boards are FR4 170Tg/290Td which are suitable for lead-free processes and temperature.
- They have ENIG (gold) finish for superior solderability and environmental resistance.
- They're 1.6mm thick (0.063 inches) with 1 ounce copper on both sides. For four layer boards, the internal copper is 0.5 ounce.
- The minimum specs are 6 mil traces with 6 mil spaces, and 13 mil drills with 7 mil annular rings.
- Internal cutouts are allowed and supported. Draw them on your board outline layer.
- Plated slots aren't supported.

Questions?

- Forum available via http://oshpark.com

- Email go OSH Park best in conjunction with order

- I'm pete at soper dot us

- These slides are at http://bitser.net/talks/oshpark-20121210.pdf