

Get Rich Slow!

How to Plod Your Way to Prosperity | By Guy Marsden

Editor's note: First Person is a periodic feature written by inventors, for inventors.

Mine is a fairly typical inventor story – I saw a need and designed a product to fit that market niche.

It all began about 10 years ago when my wife and I moved from California to Maine and purchased a small rural property with a house and barn. I converted the barn into a well-insulated, solar-heated workshop. The ground floor was for my power tools; the second floor housed my electronics lab and office.

A local solar dealer helped me design the heating system, which uses collectors to store heated water in an 80-gallon tank. The water heats the concrete radiant floor and baseboard radiators on the second floor.

After a few months of tweaking, the system worked quite well. Of course, I use propane as a back-up for cloudy days and cold nights – Maine winters can be brutal!

A few years later I noticed the temperature in the storage tank would drop in the late afternoon. I eventually figured out why.

The pump circulates solar heated anti-freeze fluid from the collectors to a heat exchanger where the heat is then transferred into the storage tank. The fluid in the collectors can reach temperatures above 200°F on a good solar day. The 80-gallon tank can reach more than 160° on a good sunny day in winter.

The small 12-volt pump, powered directly from solar panels, would run late into the afternoon in the winter – long after the collectors had become colder than the storage tank. The solar collectors essentially became solar radiators and pumped stored heat out of the tank. Not good!

I did some research and found devices called differential temperature controllers that fix this problem. They monitor the

temperatures of the collectors and the tank and only activate the pump when the collectors are hotter than the storage tank.

However, all of the units available on the market at the time were designed for 120-volt systems. I needed a unit that would use power from the 12V solar panel to control the power between the panel and my pump.

As an electrical engineer who makes a living developing electronics products for inventors and small companies, it was a no-brainer for me to build a simple differential temperature controller. I posted a note on my blog about this controller and a few people asked me to build one for them. A few years later I thought, “Hmmm, maybe there’s a small business opportunity here.”

I designed a production version of my simple prototype. I spent several weeks refining the concept and selecting parts that would make it reliable and inexpensive.

I used a spreadsheet that listed all of the components down to the smallest part and priced them out in various quantities for different sized production runs and then

found the lowest prices on these components.

I also priced the cost of having professional assembly houses make my product. The spreadsheet also calculated my markups and wholesale volume discounts. When I changed the cost of a

single part, I could see how it affected the bottom line and could then tweak my retail and wholesale prices to reflect my actual costs.

I optimized my pricing for small runs of 100 pieces. Later, with larger production runs, my profit margins could increase due to lower costs of volume purchases.

I designed a circuit board to fit inside an off-the-shelf plastic enclosure. I built a

prototype and tested it thoroughly on my own heating system for more than a month. It worked just fine.

I then ordered my first batch of 100 circuit boards and all the parts, labels and boxes needed to produce the first run. I set up a spare table in my workshop and hand assembled each controller by soldering in all the components, modifying the boxes, installing labels and doing final testing.

I used wood-working tools to make cutouts in the boxes for the electrical connections.

Once I had a small inventory, I designed a website for the product I called the DTC-1. I posted pictures, specifications and a downloadable instruction manual. I also built separate web pages for retail and wholesale purchasers so that people could simply “click to buy” single units at full retail, or minimum quantities of five at lower wholesale prices.

I used PayPal to handle the order processing so people could purchase using their credit cards or PayPal accounts.

My next step was to send press releases to all the solar industry trade journals, including Home Power Magazine for which I had written an article about the solar heating system I had designed and built.

It did not take long for orders to start rolling in. I would receive an e-mail order confirmation from PayPal, print a receipt and instructions, and then box them in small Priority Mail shipping boxes. Fun fact: The U.S. Postal Service offers free shipping boxes and other supplies.

And I used the USPS online postage printing service (accessible via PayPal) to print shipping labels. It all looked very professional. Checking my e-mails in the morning went from being a mundane task to the delight of orders rolling in almost every day. I used to kid that my e-mails had

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Inventor Guy Marsden as mentor, supervising helper Taylor Oddleifson assemble differential temperature controllers for solar heating systems.

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Most of my sales are direct retail to individuals. However, I have a number of solar dealers and installers who buy my product in small wholesale batches of five to 20 pieces.

Over the years I have made improvements, including features my customers have requested. Once I have a working product, I send beta test models to a few solar professionals to get their feedback. This feedback has been helpful to refine the details.

At the end of my first year I had turned a profit of more than \$10,000, which really surprised me. A modestly successful business was born and I have

been growing it carefully ever since.

I incorporated the business as a limited liability corporation or LLC with the guidance of a business professional from SCORE, an organization of retired executives. The free counseling entailed two face-to-face meetings with a retired small business professional. This helpful guy walked me through all the steps necessary to set up a small business and all the issues ranging from what type of corporation to set up to business liability insurance.

I never thought of myself as an entrepreneur, but I seem to have gotten the hang of this pretty quickly.

If I had a regular day job I would not have had to quit it because the business takes no more than an hour a day to

manage, on average. As a self-employed engineer, the income is a nice consistent sideline that fills in my cash-flow gaps.

After a year or so I hired local teenagers to do the assembly work and paid them the equivalent of what I would have had to pay a production assembly house. This worked out well for all concerned because production assembly houses need a minimum run that I was not ready to pay for, while my local labor pool could work as needed and be on call if larger orders came in.

They work on their holidays and in the summer to build inventory for me. They’re delighted to have a job that they can walk to, and work on their own schedule. And it beats flipping burgers. My first employee went off to college to get an engineering degree. My second, Taylor, is leaving me next year. Another young man down the road is standing by to take over.

The segment of solar heating systems that use solar power to operate circulation pumps is definitely a niche market. But the business has grown slowly, and I have been careful to plan ahead for significant growth if or when it occurs.

I have priced out high-volume circuit board manufacturing and assembly shops. I feel confident that if I got an order for hundreds of units, I could deliver them within six weeks and make a good profit.

I’ve promoted my product with press releases along with targeted print media and web advertizing. I also use Google AdWords to promote my website with targeted keywords and a controlled budget. Most of my retail sales go to customers who are DIY solar types who design or install their own solar heating systems.

My strategy for building my business has been thoughtful and methodical. I am not the kind of person who likes to gamble or take risks. This is the second small mail-order business I have started on a shoestring that has really paid off due to careful planning.

I consider this my “get rich slow scheme.”

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