

8 **The Family (Sun)stone**
by Ray Rasmussen

30 **3D LDS Components:
New Opportunities in PCB
Layout and Production**
by Malte Borges

42 **Aerosol Jet Technology for
Production Grade/Scale
Printed Electronics**
by Ken Vartanian

52 **Making the Impossible
Possible**
by Judy Warner

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NEW CONCEPTS
AND EMERGING
TECHNOLOGIES

Aluminum Base Circuit Technology: Structures & Manufacturing Methods

by Joseph Fjelstad, page 18

The Family (Sun)stone

by Ray Rasmussen

I-CONNECT007

During the IPC APEX EXPO show in Las Vegas, I had the chance to meet with Terry Heilman and Rocky Catt, owners of Sunstone Circuits. They wanted to introduce me to their new marketing manager, [Matt Stevenson](#).

During the discussion, we talked about their company and what they believe is their unique style of doing business. Although I understood much of what they were trying to convey, Heilman suggested I make a trip to their factory to see for myself. I'd have to experience what they were doing to get the complete story. He was right. There was much more to the story.

By the way, the title for this article came to me early on while touring their factory and stuck in my head throughout the day and as I started to put this article together. I think you'll see why.

The Company

[Sunstone Circuits](#) is tucked neatly into a small valley in a rural community about an hour south of Portland, Oregon. Employing about 150 people, this nondescript factory, a kludge of rooms in a building constructed and modified many times over the last 50 years, pumps



Figure 1: Front row, l-r: Terry Heilman, Sheri Kurelich, Rocky Catt, Nolan Johnson, Nancy Viter. Back row, l-r: Molly O'Hara, Les Stephens, Paul Waterman, Matt Stevenson, Al Secchi.

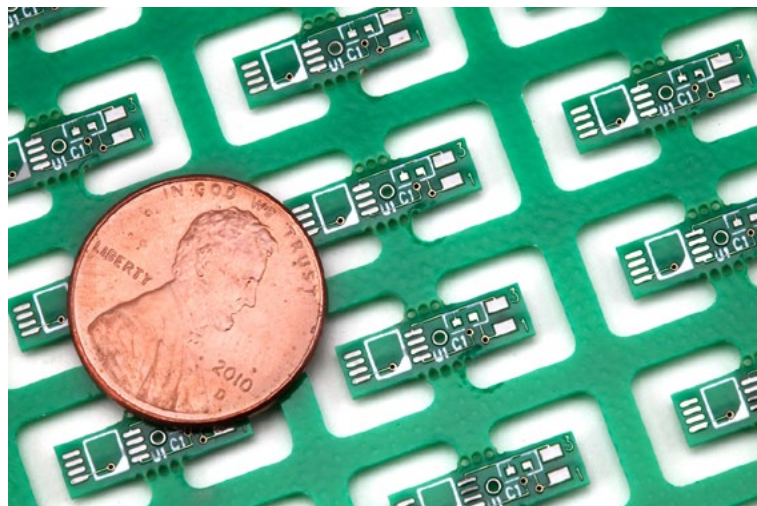
out about 200–250 quick-turn, prototype PCB orders each day to meet the needs of customers, predominately in the U.S. Like clockwork, orders flow into their highly automated website and frontend systems, and 24–72 hours later (mostly, depending on board configurations) flow out the back door of the shipping department.

Although a small manufacturing footprint, it's really easy to get turned around as you walk from room to room following a somewhat logical manufacturing flow. It's also easy to underestimate their capabilities. They do a lot with what they have to work with. The factory has had to grow up inside a less-than-desirable, seriously constrained environment. If asked, Sunstone managers will tell you that the company occupies 40,000 square feet, but that includes a brand new 8,000 square-foot office building which houses most of the management, customer service, inside sales, marketing and most admin functions. The rest is where they make PCBs, 24/7, almost 365 days of the year. It's not necessarily an elegant dance, but there is style, form, function and friendliness to it.

The Dance

Years ago I had the chance to visit high-tech proto maker DDi. At DDi, there wasn't any finesse. They muscled out high-tech protos to all comers at astronomical prices. It was a model that really worked for them. DDi had lots of technical capabilities and the people with the expertise to push the boards through the factory to capture the ridiculous amounts that Silicon Valley engineers were willing to pay to prove out a product design. As was pointed out to me, they were selling time, not just PCBs. I suggested to the management that some systems work might really help them lessen the chaos, accelerate the manufacturing flow and make more money. You had to admire what they did back then, but they could have done so much more and been so much better.

Sunstone is better. They don't tackle the technology the way DDi did, but they have certainly embraced systems thinking. Boards flow through the factory at lightning speed, but it's more of a dance as opposed to a monster truck rally. It's not a rushed or hectic environment,



but a nice, smooth flow. How often do you see harmony in a board shop?

The Family

Here's where I came up with the article title. During my span of 25 years covering the industry, I've heard lots of companies talk about their people in glowing terms: "we're like family," or "our people come first," or "it's all about the people." The majority of the time, those statements don't have much substance. You'll hear comments like that when a company embarks down some type of continuous improvement path. It's one of the first things managers start talking about, but it's also the first thing they drop when the going gets tough. With Sunstone, although they, too, have embarked on a continuous improvement path, the family (the people) genuinely does seem to come first. And I literally mean family: sons and daughters working with their parents who've been with the company for decades or spouses with long, collective histories with the company. Still, there is a company-wide esprit de corps fostered by the leadership. I'm sure it's not all roses, but there seems to be a genuine, top-down commitment to the well-being of the entire Sunstone family.

That commitment to the employees ultimately takes care of the customer. It's W. Edwards Deming's teachings without the Deming. Heilman and Catt say it just makes sense. It makes for a great place to work, builds employee loyalty and translates into a better expe-

rience for the customers. I heard that about a dozen times from their team of managers and from those working on the factory floor: “Does it benefit the customer?” was their mantra.

Almost Unique Sales Model

Sunstone has an interesting method of generating sales, which isn’t entirely unique. Other companies follow a similar system but I doubt to this extent. The company markets heavily on the Internet, casting a wide net, moving prospective customers into the automated sales system built into their website. Orders are placed there and files are uploaded, and it’s all done pretty much without human contact. According to Heilman, their goal is to bring in 15–20 new customer orders each working day. That’s somewhere around 300–400 new customers each month, on top of the 4,000 or so orders they process from existing customers. To give you some perspective, with an average order value of around \$500, you can work out some rough annual sales revenue numbers, which likely places them in the range of \$20–30 million annual revenue. Having already attracted over 30,000 customers, I had to ask how many more prospects Sunstone thinks are out there. After all, it’s a finite market. You can’t reach 15–20 new customers a day forever. They felt comfortable with their strategy and thought that the goal could continue to be achieved for some time to come. Of course, they continue to nurture their current base of customers looking to grow that business, as well. My take is that they’ll have to begin offering leading-edge technology capabilities to attract more business at some point.

Industry veteran Harvey Miller, owner of the PCB directory [Fabfileonline](#), reports the size of the North American market to be about \$1.2 billion for prototype PCBs annually. Heilman thinks that number is closer to \$350 million for rigid board prototypes. In either case, Sunstone has room to grow.

The Sunstone model does sound attractive, though. They have a wide, diverse customer base (10,000 of the 30,000 placed orders over the last year), which builds in some security. Approximately 50% of Sunstone’s customers provide about 75% of their revenue, which means they must do a great job of keeping customers;

combined with the new ones coming in every day, it makes for good, predictable growth.

Another interesting fact about this sales model is that about 80% of their orders are paid by credit card, which partially explains why their bad debt only amounted to \$3,000 over the last year. Other contributing factors are the various other benefits to their credit card model, such as increased cash flow, security of payment, etc. But there is a cost associated with this model, which does detract from the bottom-line benefit. Nonetheless, when you look at their cost of sales, cost of manufacturing, overhead, lack of debt service and, now, virtually no bad debt, they pick up a couple of points in all these areas. Overall it’s a simple and effective model.

Customer is Always Right

This is easier said than done. At I-Connect007, we love our customers and tend to side with them when things go awry, but they aren’t always right. Sunstone tends to walk the walk that no matter what happens, it needs to benefit the customer. I don’t think this was a show put on just for my benefit. I heard it too many times, in too many places, from a lot of different people at Sunstone. They genuinely want to care for their customers. Everything they do must be of benefit to the customer. Again, Deming says it a little differently: Care first for employees, which Sunstone appears to do (see “The Family” above) and they will take care of the customer. Regardless of the order of things in Sunstone’s thinking, it is what’s happening: Everyone’s needs are being met.

Philosophy

The owners claim that Sunstone is quite profitable, and they’ll continue to work to drive waste out of their systems, which translates into additional profitability and more capacity, and in turn, increased benefits to customers. I get this, and I am quite surprised at how few companies pursue excellence in manufacturing and in business. It’s a no-brainer for me.

Since 2005, when Heilman and Catt purchased the company from Electronic Controls Design (ECD), they’ve been able to pay off the previous owner and continue to upgrade capabilities while staying out of debt. Even the new

facility they built was paid for with cash. According to Heilman, being debt-free is by no means a mandate, but instead, a result of budgeting capital equipment and facility upgrades yearly in order to maintain a financially responsible model. That discipline has placed them in the catbird seat as they survey the industry for additional opportunities. They're certain that their business model will work in other PCB factories or in other industries, as well, and in turn, value the customer.

Alliances

Sunstone has a partnership with Screaming Circuits, an EMS partner that handles any assembly work that comes in. Located just 12 miles from Sunstone, Screaming Circuits, like Sunstone, is truly customer-focused, and their relationship is "very synergetic," says Heilman. When asked about vertically expanding their services, they were quite comfortable with their assembly partner as this point. While they do offer layout services for their customers, they are not in the design business.

The Technology

Sunstone does not pretend to build leading-edge PCBs, either; it's not their model. What they do is reliably deliver 2-, 4-, 6- or 8-layer, 5/5 mil lines and spaces boards, quickly, complete and on time, guaranteed. They can do up to 20 layers and tighter lines, but it's not their sweet spot. I do see a pretty compelling opportunity to climb the technology ladder a bit, which could open the door to more customers or significantly expand the volume of business they do with their current customers.

Their business model does not focus on performance certifications, and as such, they aren't certified for mil/aero or medical, but I did notice an ITAR registration from a 2012 press release. They say their customers just don't need those certifications to prove out a circuit, and that the amount of business they lose doesn't justify the expense of qualifying and maintaining the certifications—not for the kind of work they do.

Manufacturing Challenge

Running at about 75% capacity, there is room to grow, but the facility is currently maxed

in size due to land zoning restrictions. That size restriction is somewhat limiting and is requiring them to look at new equipment which can produce more product within the existing footprint. The good news is that many of the new systems do just that. And, as long as they're as profitable as they say they are, buying the equipment necessary to add another 20–50% capacity is very doable. In addition, just about everything they buy will give Sunstone higher-tech capabilities, which could help them move up in technology offerings.

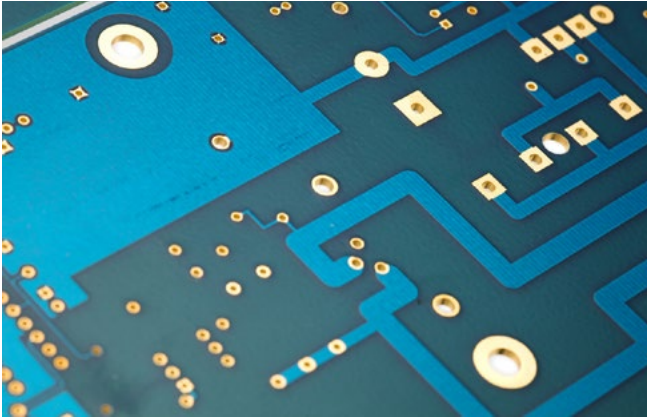
Small Batches

Optimized processes designed to utilize equipment efficiently translates into five or six 14"x16" panels making up the normal lot size running through the factory. Because of that, you see equipment sized to fit that manufacturing model. Panel utilization is maximized as like jobs are aggregated or nested with other like boards, while increasing throughput to keep costs down for the customer. I do believe Sunstone has an opportunity to accelerate their manufacturing even more, but that would probably require additional equipment and more factory floor space. But right now, if customers order a conforming PCB by 4 p.m. PST, they can be assured that their order will ship the next afternoon.

In their shipping department, a five-foot high stack of FedEx and UPS boxes are staged and ready to meet the day's orders. What looks like a frenzy really isn't one at all. It's a well-oiled machine driven by tight systems and highly dedicated employees, although the department tends to get a bit harried as shipping times approach, I was told. But most jobs fit nicely in the shipping boxes provided, which simplifies and speeds up the shipping process.

Redundancy

Quite honestly, redundancy was the weak link for me. Because of their factory size constraints, they aren't able to add a lot of redundancy to their systems. Also, their location, although it's probably a great place to live, is somewhat isolated. However, according to Heilman, that's where the years of experience come in. And as Nancy Viter, director of manufacturing explained, when their photo processor



.....

went down recently, instead of panicking, they switched back to trays of solution to process the film, the way they used to do it. They do the same when other processes fail. They know how it was done in the old days, so they adjust until they get things running again. They do have co-op agreements with a few fabricators in the area, which can help in a crisis. And operating 24/7 gives them the opportunity to fix a process and catch up during the next shift. Maintenance people are available at any hour of the day to ensure things keep humming.

Equipment Upgrades

Although the operations are well-controlled and thought out, the company can benefit greatly from some newer equipment. There are a few new purchases in the wings, which Viter discussed while we were touring the factory. They're looking at a new two-spindle drill machine and a direct imaging system, both of which are designed to increase throughput and improve capabilities. I'm sure these new systems will also help maximize the factory production footprint. There's also an OEM press on order that happens to be the only one small enough to fit in the space of the old press, and they're continuing to upgrade as it makes sense.

As I mentioned earlier, Sunstone's commitment to remaining profitable has driven their efforts to maximize usage of existing equipment and processes. They prefer to make smaller, budgeted, methodical moves when it comes to capital equipment. They don't have to climb the technology ladder too quickly to meet the needs

of most of their customers for 5/5 technology. Instead, their focus is on speed and customer service. How can they move boards more quickly through the factory and out the back door to the customer?

Management Experience

As I talked with the management team and factory floor employees, names like Tektronix, Merix, Praegitzer and Viasystems, popped up. It seems that Sunstone has been the beneficiary of the talent of a few of its neighbors and bygone shops. The rest of the company employees have been homegrown over the last decade or two. More on Sunstone's managers in the sidebar.

The Guarantee

Putting their money where their mouth is, they've upped the ante by attaching a guarantee. If they don't "deliver quality boards, on time with the right quantities," then the order is free.

I think if most of us realized we were going to be late, we would prefer to work with customers to see if they were OK with the delay or to see if we could make partial shipments, etc. We wouldn't discount our work unless we had to. In fact, most customers would probably be fine with a delay, here and there, as long as the communication was good. They're kind of used to that.

When the idea of a guarantee was first floated at Sunstone, some thought it was a bit too much. But after a review of their delivery history, they decided to make that offer and stand behind it. They have had to eat a few orders since they first instituted the program, but the process improvements they've made as a result have benefitted the company way beyond the cost. They've had to step things up but it's been a win for the company and a win for the customers.

Although I might have ruffled a few feathers among senior managers when I called the guarantee a gimmick, I did follow that up by saying that offering a guarantee does three things. It gets people's attention, it demonstrates confidence, and it helps ensure customer loyalty. The gimmick is what we see on the outside, but the systems and people behind it, as well as the effect it has on the customer, are the real thing.

The Sunstone Team

In the words of Director of Manufacturing
Nancy Viter:

At Sunstone, the philosophy of empowerment is more than just a catch phrase. Each team member is a leader in his own way, and understands that the responsibility to give the customer the best experience possible falls squarely on each individual's shoulders. The beauty of this way of thinking is that there is very little finger-pointing when problems arise. Team members are expected to contribute to the solution, regardless of the challenge. If a piece of equipment goes down in the middle of the night, waiting until morning when a leader arrives is not an option. This builds teamwork, as all available resources come together to share manpower and knowledge. Are there teachable moments that might result in a well-meaning, but perhaps unsuccessful solution? Absolutely!

But individuals know that making a decision is better than doing nothing at all, and with all the years of experience and successful problem solving to call on, the risk of this empowerment philosophy is minimal. From the head of the organization all the way to the newest, youngest staff member, Sunstone leads by example, whether there is a title attached to the name or not, and this concept is taught in word and deed as new hires are trained.

All that said, here is a snapshot of some employees who contribute to our success daily:

Rocky Catt (41 years), co-owner: With 30+ years of experience, Rocky has served as a line supervisor, general manager and is the vice president and COO of Sunstone Circuits, where he oversees the company's operations.

Terry Heilman (16 years), co-owner: Terry oversees all corporate operations, strategic marketing and financial planning for the company, and Sunstone's significant growth reflects Heilman's guidance and contribution to providing the most extreme customer experience in the industry.

What I liked most about the guarantee is the opportunity it provides Sunstone to improve the process. I remember when Motorola went to Six Sigma (zero defects) as the quality standard to strive for back in the 1980s. They realized that if they chose the more attainable goal of Three Sigma they could continue to do the same things just a little better. With Six Sigma they'd have to change everything. It caused a revolution in their manufacturing. In my mind, the guarantee is that kind of an effort, and it would cause many in the industry to have to reinvent their companies. Still, many companies will tell you that they're 100% on time but when you really look at the data, that isn't the case. There are lots of exceptions used when calculating that number. The Sunstone guarantee, from what I gathered, is that they honor the guarantee regardless of the situation without input from the customer. If they don't do what they say, they pay. As a result, over 50% of the customers who've received free boards are pleasantly surprised.

Open all Year

That's another differentiator the company uses to expound on their customer service. They are always open, and available to take customer calls. Heilman was unapologetic when we talked about the commitment behind this next level of service. "Why not? Why wouldn't we offer this to our customers? Shouldn't they be able to talk to somebody whenever they want? If it's important to them to know the status of their boards or to try and solve a problem on New Year's Eve, shouldn't it be important to us, as well?"

The Squeeze

Since I'm not a maker of prototypes, I haven't been noticing the effect that improvements in PCB design software has had on this segment. It seems that the software is getting pretty good. In fact, as Viter pointed out, they're seeing fewer and fewer PCB revisions. Customers are now able to prove out designs in software, pretty much, which leads to fewer prototype orders.



Better design software, emerging technologies like printed electronics and other engineering prototyping systems will continue to pressure the company in the coming years. But that's where Heilman and Catt come in.

The Future

The partners are keeping their eyes open for opportunities to grow and expand their business. Landlocked in their current facility, any substantial growth will require an additional facility, an idea which is on the table. Neither Heilman nor Catt are in a hurry to grow, but when they do, they will likely do it carefully and methodically—not just for the sake of growth. Heilman's extensive background with M&As and business management should help them avoid many of the pitfalls associated with mismatches so common in typical M&As. Expansion, acquisitions, adding value to the services they already provide to their thousands of customers in the PCB industry are all on the table. They are very profitable, debt free, growing and having fun. It would seem to me that Sunstone is ready to make a carefully calculated next move. **PCB**

The Sunstone Team *(Continues)*

- *Sheri Kurelich (21 years)*, human resources
- *Ed Graham (38 years)*, safety and environmental
- *Bill Moffatt (28 years)*, maintenance
- *Lynda Postlethwaite (30 years)*, sales and customer service
- *Joe Phelps (16 years)*, automation programming/ CAM support
- *Wayne Austin (31 years)*, CAM
- *Tammy Russell (27 years)*, mechanical operations
- *Donna Miller and Cindy Marshall (64 years combined)*, line
- *Bill and Sue McDowell (50+ years combined)*, imaging and plating
- *Jake Taylor (11 years) and Mike Hebda (12 years)*
- *Karen Brugger (23 years)*, quality
- *Carrie Adams (30 years)*, (LPI)
- *Albert Wolf (36 years)*, (LPI)
- *Trina Taylor (16 years)*, imaging
- *Doug Miller (7 years)*, shipping
- *Mike Connella (7 years), Jeff Loewen (7 years), Tom Hall (10 years), Carrie Ditton (8 years), and Dennis Hammer (<1 year)*
- *Kelly Atay (10 years)*, administration
- *Teresa Burtis (17 Years)*, administration
- *Mike Butler (5 Years)*, IT
- *Sal Hernandez (8 years)*, customer support
- *Matt Rhodes (4 years)*, customer support

And then there is me, **Nancy Viter**. I consider myself more of a cheerleader, although I could be considered a director of a beautiful orchestra that is made up of the entire Sunstone team. Each individual is like a finely-tuned instrument, and we make beautiful music together. Everyone knows his part, plays it dependably, and the unique Sunstone symphony would be difficult, if not impossible, to copy. We play for a very special audience: our customers and one another.