Servo Technology & Linear Saws Offer "Limitless" Production Capacity

by Steve Shrader, Hundegger USA LC

"The factory of the future will have only two employees, a man and a dog. The man will be there to feed the dog. The dog will be there to keep the man from touching the equipment."

-Warren G. Bennis

very time the term "technology" comes up in an issue of **SBC** my heart starts to beat faster. Could it be? Is this the issue that reveals the latest advancements in saw technology? No! It's just another column about a new engineering application of the International Residence Code (IRC) or another prescriptive requirement in the International Building Code (IBC). Don't get me wrong: it's not that I don't love a good column that cross references the WFCM, IBC and ANSI/TPI, but I have been dying to read an article about servo technology and CNC control!

Allow me to give credit where credit is due. **SBC** does a fantastic job bringing issues like code updates to the industry's attention. Articles regularly educate the readers on Just-In-Time (JIT) or Ouick Response Manufacturing (ORM). All of the issues relating to component manufacturer business practices are presented to **SBC** readers accurately and in great detail. But I have never read about the latest advancements in saw technology. I might be totally alone here, but I have been fortunate to be riding the current automation wave spreading across the industry—linear saws.

Linear Saw Market Explosion

It was almost three years ago in Phoenix, AZ at the BCMC show that the linear saw made its presence known. That year there were four linear saws that I remember on the show floor. Twelve months later at the 2004 BCMC show in Charlotte, NC there were nine! If you have not heard of these saws by now you really need to get out more.

From my perspective and that of many component manufacturers, it is safe to say that the industry had to see it coming. In the past 12 years, truss manufacturers have been introduced to "curb appeal," the non-symmetrical, cut-up roofs that are just plain nasty. The days of common gable end runs, same sized trusses are long gone. Most truss plants are lucky if there are even two trusses that are "similar" to one another. The harsh reality is today's cut-up onesie-twosie packages require more set-ups than there are truss parts in one job.

at a glance

- In the last several years, linear saws have become quite popular with component manufacturers by offering greater flexibility than traditional component saws.
- Servo-driven motors are the technology behind linear saws. Servo technology continues to advance at a rapid pace in the building components industry.
- While linear saws are ideal for onesietwosie set-ups, the standard component saw is the best type of saw for producing multiple accurate parts produced very quickly.

The "first generation" of component saws required manual set-ups. They were proficient regardless of the fact that they required time to set up the length and angles manually. With the introduction of servo technology, these saws advanced. But what exactly is servo technology?

A servo is a small electronic device or an electrical encoder used to give feedback on mechanical motion. This device reads and sends electronic signals giving constant feedback on bigger motors. Servos can control one or a combination of positions, velocity, direction, angles and bevels. As the electronic signals change, the position of the servo shaft changes, which in turn controls the bigger motors. Servos are used in radio-controlled toys like airplanes to position control the elevators and rudders. They are also the standard of modern production factories.

Soon after the servo revolution, component saws had data entry points, or keyboards, into which the operator could input data that would automate the set-up. But setups still required time.

Industrial servo technology has advanced considerably over the past several years. The largest advances have been in the area of digital control algorithms. In the past, servo drives were predominately analog (think cell phone). Today, digital servo drives provide numerous opportunities to improve the performance of a truss or wall panel saw.

Servo Technology Facilitates Speed & Precision

Due to the advances in servo technology, today's saws are very flexible, very fast and

very productive. The single-bladed servo linear saws on the market today use the technology like a pizza cutter, providing high-speed precision of the saw blade and positioning of the wood as well. With a zero set-up time, a linear saw can constantly cut different (onesie-twosie) parts from one piece of stock material. One proud linear saw owner was bragging how his saw was making 3,000 - 3,500 set-ups and cutting 8,000 - 10,000 parts in a 40-hour week. These are custom parts, compound cuts, hip and valley parts.

This technology means that all the custom parts, once timeconsuming, inefficient and labor-consuming, can now be done safely and automatically by a saw. Parts that used to take hours and require double handling and unsafe tools can



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now be cut in seconds-automatically and safely.

Component Saws Obsolete?

This does not mean that the component saws are obsolete. I was recently asked by a truss plant manager how a linear saw would take the place of his component saws. It seemed he was under the impression that the linear saw would—at some point in the future—completely replace the component saw. I do not believe this will ever happen. The traditional component saw can serve a need that the linear saw cannot when it comes to multiple repeat parts produced very quick-ly. On the other hand, there are things that the component saw cannot do when it comes to multiple set-ups and compound angles. Both saws have a valuable contribution to Continued on page 56



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the industry and today they work to complement each other.

Who Buys Linear Saws

Most companies that buy linear saws do so because of the machine's flexibility. One owner has acknowledged that the "hot" jobs go to the linear saw because all of the parts come from one saw and the turn around is much shorter than if a traditional component saw had been used. Additionally, the disruption to the linear saw is very minimal, if any at all, because the set-up takes no time. A linear servo saw should be able to take material of different sizes and lengths without skipping a beat—even if inserted in the middle of a run.

One of the areas to watch is the software interface. In the past, saws only required length, angle and quantity information from design software. Now information like bevel, compound and special tool control is also needed by today's saw. The saw's mechanical technology has advanced faster than design software, in most cases. The manufacturing industry is trending toward a model of full automation from design down to delivery. The power of design/production software in combination with the right machine can mean almost limitless possibilities in production, increasing quality, safety and the bottom line. For this to happen, the software-tomachine interface needs to keep in pace with the mechanical advancements of linear saws. Most software companies realize this and have been developing solutions to keep up with the increased saw technology. These software companies are the ones who exhibit each year at BCMC and have not only seen the popularity of the linear saw grow, but they have heard about them from their customers as well.

Widespread Education Necessary for Most Efficient Use of Servo Technology

It is very exciting for me to visit component shops all over the country. It is very interesting to observe a manufacturer who is going through the equipment implementation process. As they get acquainted with their new saw, they always seem to think of new areas where a linear saw might help cut costs and increase production. Inevitably, there is a learning curve and a transition period in implementing a new piece of equipment. As with any new technology or equipment, the purchase of a linear saw will change the way fabricators look at the entire manufacturing process. This is where technology becomes fascinating: technology that enables the brain to rethink and improve the process!

Microsoft CEO Steve Ballmer sums it up best: "The number one benefit of [information] technology is that it empowers people to do what they want to do. It lets people be creative. It lets people be productive. It lets people learn things they didn't think they could learn before, and so in a sense it is all about potential."

I like to emphasize the basic education process to manufacturers who are considering a linear saw. The production personnel need to understand the technology so that they can make realistic production schedules. Managers and foremen need to understand the technology so that they can communicate intelligently with designers, maintenance people, operators, and others working directly with the saw. Companies need to have a decent understanding of this technology in order to work effectively with their new saw.

Most companies I work with quickly come to rely on their linear saw more than they ever thought they would. It changes them and they experience added success. Maybe now you can see why I long to read more about servo linear saw technology!

I cannot predict how many linear servo saws will be at BCMC 2005 in Milwaukee, WI. I do know that there will be fabricators who will look, but are waiting until they are "forced" to buy. There will be those who come to decide which one to buy, and there will also be those that have implemented the technology and want to talk about what it has done for their business and possibly order another one. Whatever the reason, they will be talking about saw technology. That's always a good thing. **SBC**

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