

SCHIPPERS & Crew, Inc.

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E L E C T R O N I C S M A N U F A C T U R I N G S E R V I C E S

Holiday Message from the Founders

Last year our holiday message was full of hope because everybody needed it. This year is going a lot better. Most economic forecasts we've seen project a busier year in 2004 - good news for everyone!

Did your company experience something similar to ours? The downtrend of 2002 had started to level off at the end of that year. The first couple of quarters of 2003 started to recover and near the end of the year we decided that the turnaround had occurred. We haven't yet made up all the lost ground, but steady recovery is underway. We hope you've noticed a good uptrend like this too.

During the year we expanded by purchasing various pieces of equipment. This turned out to be a good move when we started into recovery and the workload increased again. In our SMT Dept we added two high-speed pick & place machines and, recently, another reflow oven. In the Quality Dept we added AOI (Automated Optical Inspection). More personnel with technical expertise were added to the crew.

But the favorite new machine around here by far was the soft ice cream machine we put in the lunchroom. Ice cream Fridays were especially popular during Seattle's long beautiful summer this year! Vendors and customers who happened by were also treated to free ice cream cones.



Our 2nd Conception HVA-102 seven zone reflow oven arrives

In the coming year we will implement new manufacturing software to help all of our departments, from sales to shipping, operate more smoothly. And who knows what equipment will be added! We'll also be exhibiting at the Northcon show, coming up March 24-25, 2004 at Bellevue's Meydenbauer Center. Hope to see you there!

We'd enjoy hearing how your business has been doing in the recent economic environment and what your forecasts are for the coming year.

Wishing you a Merry Holiday Season and a Prosperous New Year!

Bert & Lynne



Success with SMT

With new PCB designs fitting more and more circuitry onto smaller and smaller boards, the volume of SMT work we see has skyrocketed in recent years. SMT (surface mount technology) is marked by small parts that mount onto a single side of the board in contrast to traditional components that are inserted through holes in the PCB. Efficient assembly of SMT products can only be achieved by using fast pick & place machines. These machines can place up to 15,000 parts an hour.

While proper design and manufacturing practices are important to ensure good results, proper component packaging is essential for smooth, on-time assembly.

Schippers & Crew has 4 pick & place machines, each one geared to accept diverse types of components. Our SMT machine operators load each machine with the proper components for the upcoming build. All parts need to be present before running. A single missing component can add hours of costly hand work later.



This is a close-up of the component-intake mechanism of one of our pick & place machines. A twelve-inch leader is necessary to wind the tape on the uptake spool.

In order to feed properly into the machine, each component must come in appropriate packaging. Depending on their size, parts may come in trays, tubes or tape and reel. Pick & place machines are not able to handle parts that come loose in "bulk" packages such as bags, boxes or canisters. Parts received in bulk have to be added manually after machine assembly and can result in additional handling charges.

continued on next page

Outsource Your Assembly Call Schippers & Crew

for quotes or information on the following services:

- **SMT and Thru-hole Assembly**
- **Turnkey and Consigned Services**
- **DFM Assistance**
- **Cable Assembly**
- **Goldfinger Repair**
- **Box Build & Mechanical Assembly**
- **Test and Test Development (HP3070 Platform)**

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See our website for more information: www.schippers.com

*Free pick up and delivery
in the greater Puget Sound area*

Customer Spotlight

From time to time we like to present an article on one of our customers. In this issue we have chosen an engineering service.

Teknologic Engineering Services



Located in downtown Snohomish, Teknologic Engineering Services (www.teknologic.net, (360) 568-6205) is a full-service engineering consulting company with expertise in all phases of product development. With more than 20 former Honeywell/Raytheon engineers, their diverse staff has an average of 28 years experience in various engineering disciplines including electrical, mechanical, software, systems, and test engineering. Since its inception in 1999, Teknologic has developed ruggedized computer systems, digital data recorders, autonomous aircraft avionics, a space shuttle payload, salmon tracking systems, Navy sonar systems and test ranges, and underwater vehicles, as well as subsystems for a wide variety of commercial applications.



Customer satisfaction

Here is what Teknologic has to say about Schippers & Crew's services: "We use Schippers and Crew for all of our challenging electronics assembly needs because they provide an expert service for a very good price. They are always on time, they pay close attention to detail, and they provide us with valuable feedback on improving our designs for production. The people at Schippers and Crew are great to work with, always willing to help out any way they can." John Schlatter, Electrical Engineer, Teknologic Engineering Services.

Success with SMT continued

Small parts are usually bought on tape and reel. The parts come packaged on a long strip secured between a paper backing and a plastic covering. They are wound on a reel for easy handling. A single reel can hold 400 to 5000 parts depending on their size. It can be difficult buying for a production run of 50 boards when a single part costs \$1.40 and you have to buy a complete reel of 1000. Some distributors offer the service of cut-tape. This means they will cut the reel of 1000 into strips and sell it in smaller quantities. This can be helpful, but it can cause problems in assembly if not done properly. Our machine operators need 12" of unused tape just to load it into the machine. Complete reels come with plenty of empty tape (called a "leader") but reels that have been cut down have no leader. Loading these onto the machine will create a production waste of twelve inches worth of parts. Extra parts can be provided to make up for this or these parts can be added by hand after assembly for an additional handling charge. Cut tape must be continuous to be a viable option. Cut tape that comes in multiple strips would cause

continued on back page

Last Minute Gift Idea

If you're like the rest of us, chances are you'll turn to buying gift certificates for those hard-to-buy-for people on your list. In fact, you may have noticed retailers pushing gift certificates more than ever this year. It turns out these are profitable for them in more than one way: in 2002 consumers in the US spent \$30 billion on gift certificates and it is estimated that 12% of these were never redeemed, leaving 3.6 billion paid but not used!

Perhaps that explains the gift certificates that are popping out from unexpected places. We've recently seen advertisements for gift certificates from such places as gas stations, the post office, real estate agents, insurance companies and even the dentist!!

We couldn't miss out on this opportunity so we want to announce the perfect Christmas present... THE SCHIPPERS & CREW ELECTRONICS ASSEMBLY GIFT CERTIFICATE. Just picture the look on your loved one's face when they open up their very own Schippers & Crew gift certificate. These are now available in denominations of \$10, \$25 and \$50.

For this special promotion, we are giving away one \$50 gift certificate to the person who can describe in 100 words or less the best reason why they should win it. Email your response by Dec. 31, 2003 to paul@schippers.com.

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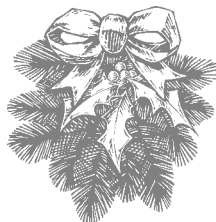
Last Minute
Gift Ideas!
See inside . . .

Success with SMT continued

waste for each strip being loaded and short strips can't even be loaded. These would all have to be placed by hand at an additional charge.

When buying cut-tape, some distributors offer the service of adding a leader or winding tape on a reel for a minimal charge. If this service isn't available, be sure to request that your cut-tape is continuous and buy extra to allow for a leader.

Of course, small runs or prototype assemblies that are going to be built by hand anyway can include parts on any type of cut-tape or packaged in bulk, as long as the component is not subject to lead damage. Call Cyndi for advice on packaging and how to make your assembly go as smoothly as possible.



Tips for a healthy & safe live Christmas tree

- Leave the tree outside or in the garage for a few days before bringing inside to decorate.
- Make a fresh cut across the bottom, about 1" above base, so your tree can drink easily.
- Make a preservative: mix a quart of water with 1/2-cup of corn syrup and a tsp. of bleach.
- After a few days in the preservative, bring the tree inside and place it in a location away from direct sunlight and other heat sources (such as heating ducts, wood stoves and fireplaces.)
- Remember to add water to the reservoir daily.

