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Circuit Board Repair Experts

By Jim Ruen, Contributing Editor

Circuit Board Medics don't just repair circuit boards; they rebuild them better than new. In a dozen years, the company has gone from a garage shop sideline to an online business with more than 100 employees.

"The company founder repaired his first circuit board when he was told a replacement circuit board for his washing machine would cost almost as much as a new machine," says Seth Stokes, Circuit Board Medics. "He had the background to repair it himself. Later, he did the same with a fuel injection control board in his Ford truck. He saw the need and started doing circuit board repair on the side.

"Today, we have customers worldwide, with the bulk in the continental U.S. and Canada," adds Stokes. "We work on everything from home appliances to class 7 and 8 heavy-duty industrial equipment."

Prices vary with the item, running the gamut from \$200 to \$2,500. The company website provides examples and pricing for a variety of repairs. Problems with LCDs in 2004 through 2008 RT120 instrument clusters run \$319.99. A remanufactured option for a Holset HE300VG Turbo Actuator that includes the installation kit and gaskets for a 6.7-liter diesel Cummins engine runs \$799.99.

Stokes notes that the current big items are control boards for Allison transmissions in Duramax trucks. "New ones are on back-order, but we've been able to do repairs," he says.

Capabilities have grown with the company. Stokes points to high-level technology, such as wire bonding, x-ray capability, and high-tech component testing at all levels.

A post on the company's Facebook page describes the use of a laser to repair circuitry in a GMC Yukon taillight. Faced with cutting through the rear casing of the light to repair circuitry flush against the backside of the surface, they used a programmed laser. This gave them access to repair the taillight's circuitry with a stronger, more reliable solution than the manufacturer. They then sealed the holes with custom-made cover plates.

Another post described technicians going the extra mile with customers, replacing clouded lenses on a control board without being asked to do so by the customer. They cut replacement lenses from a Lexan sheet and 3D printed new housing for them.

"When we finish repairing jobs, we want them better than new," says Stokes. "People are coming to us because they're getting a better-finished product than with new."

While examples such as those cited above are posted on the company website, a request form invites quotes in a wide variety of categories. Emphasis is placed on communicating



Control board was fixed, but lenses were cloudy, so replacement lenses were 3D printed.

with the company, getting an order number, and making payment before sending in a part for repair.

The company's YouTube channel provides extensive videos on circuit board repair, including removal and installation. They even include helpful basic information like using a digital voltmeter.

Contact: FARM SHOW Followup, Circuit Board Medics, 15-C Pelham Ridge Dr., Greenville, S.C. 29615 (ph 864-641-0564; toll-free 800-547-2049; support@circuitboardmedics.com; www.circuitboardmedics.com).

Spray-On Bioplastic Shield Stops Weeds



Close-up of plot showing Sharda bioplastic mulch.

Herbicide-resistant weeds will be forgotten if Vaishali Sharda is successful with her spray-on bioplastic. The Kansas State University researcher recently received a \$6 million grant to continue her work using bioplastic to control weeds and reduce soil erosion.

"Creating a protective layer over soil when growing field crops could help farmers better manage many issues at once," Sharda said. "Covering soil with sheet plastic prevents weed growth, erosion, and moisture loss, but using large amounts of plastic creates

waite, isn't eco-friendly, and is too costly for field crops."

Sharda's research focuses on locally sourced types of bioplastics designed to fully break down into safe by-products. They could provide a green way to control weeds, fertilize crops, protect soil and water resources, and work with nature to better manage fields.

"We're still in the experimental stage of testing biopolymers in the lab and greenhouse, as well as in some field trials in Nebraska," says Sharda. "We're focused on developing biopolymers that will last through the growing season. We're fine-tuning them for color, cracking, and how they cover the ground over time."

Applied to the soil surface as a liquid at planting, the biopolymer is a dark brown color at first. Over time it lightens. It suppresses weeds but allows the crop to grow.

"One of our students is working on changing the color in hopes it will reduce cracking," says Sharda. "Our project is funded for 4 years. By next year, we hope to have an even

better formulation for use on soybean fields."

Sharda is working with two differently sourced biopolymers. One is produced from chicken feathers, while the other, yet to be tested, is produced from corn stover.

"We're working with 12 different formulations of biopolymers and have tested two based on chicken feathers."

The two that have been put to the test were sprayed on soybean fields in Nebraska this past growing season. Sharda reports that they degraded, but not before the crop had reached the canopy stage.

The grant came from the National Science Foundation and is for a collaborative research effort. Sharda will direct the effort alongside three co-principal investigators from Kansas State University, the University of Nebraska, and the South Dakota School of Mines.

Contact: FARM SHOW Followup, Vaishali Sharda, Kansas State University, 1061 Seaton Hall, 920 N. Martin Luther King Jr. Dr., Manhattan, Kan. 66506 (ph 785-532-2745;

The "Double Ugly" Tabletop Model

Over the past 15 years, Don Campbell has built hundreds of finely detailed custom 1:12 scale model tractors and other vehicles. One of his recent creations commemorates "Double Ugly," the ear-splitting 24 cyl. 1,000-hp. pulling tractor built by the Michigan Madman, E.J. Potter.

Campbell, who's also from Michigan, says he never met Potter, although he grew up hearing many stories of Potter's exploits with exotic custom-made motorcycles. Potter's most famous builds were the 500-hp. "Widowmaker" and the smaller horsepower "Bloody Mary," each with souped-up Chevy V-8 engines. Potter turned to building pulling tractors in the 1970's and soon became a legend in that category, too. Like Potter's motorcycle creations, The Double Ugly tractor was a sight and sound to behold.

Campbell built his Double Ugly model without plans. He worked from pictures and

used his trained eye and years of experience to scale every part of his model to near-authentic size. The 1:12 scale model closely replicates Potter's hand-crafted rig that rode on two massive rear wheels and a rugged steel frame with narrow front steering wheels. The model has an open cockpit style driver's station riding above and behind small replicas of the tractor's two Allison V-3420 aircraft engines. Both engines have finely detailed headers, ports, and pipes that Campbell crafted to resemble the originals. The model's levers, wiring, steering wheel, and front suspension mimic those on the real tractor.

Campbell says Potter came up with amazing ideas and built them out, living by his often-used phrase, "Ignorance is a powerful tool if applied at the right time, even usually surpassing knowledge."



Master model builder Don Campbell built a replica of E.J. Potter's "Double Ugly" pulling tractor, which featured two Allison aircraft engines.



Potter on board this original Double Ugly tractor.