

A BARKS PUBLICATION

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Electrical Apparatus

More than Motors

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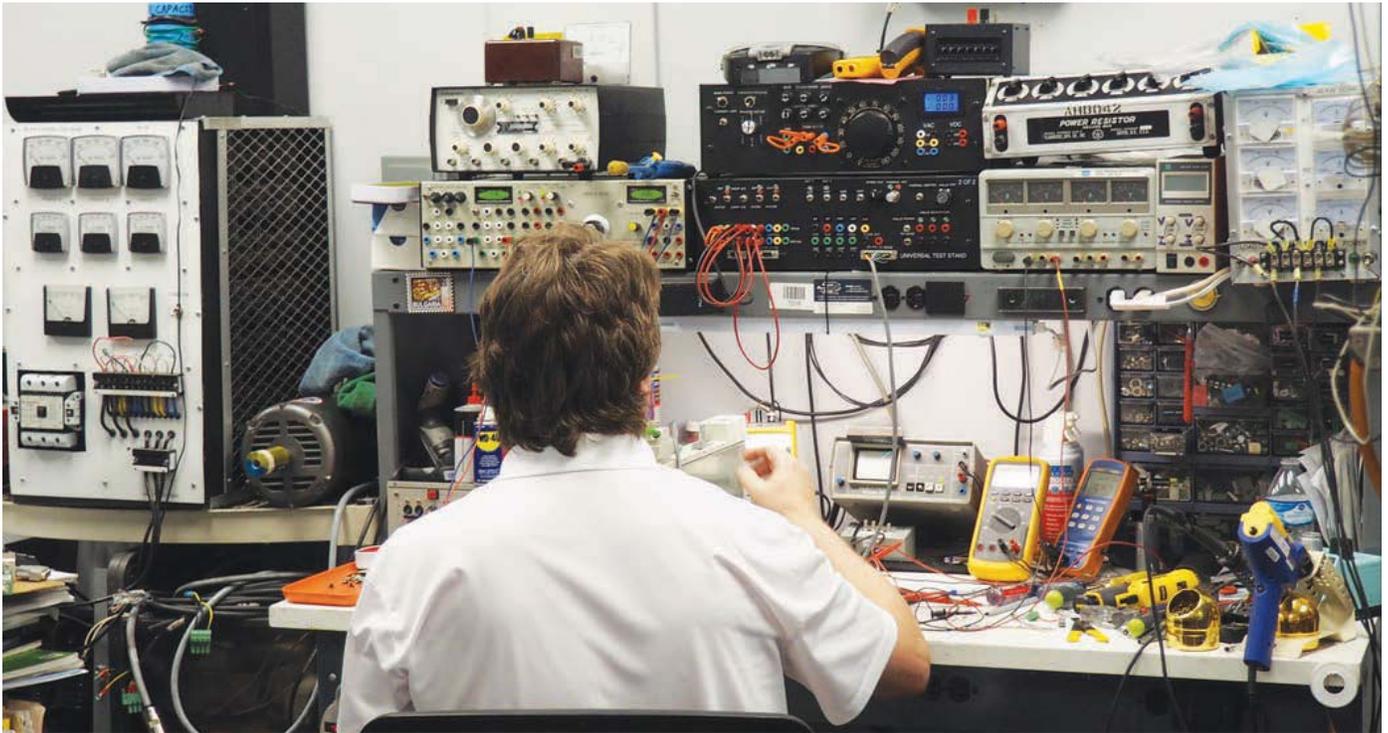
**Specialty
Labs
at Industrial
Repair Service**

Wind Energy Spotlight
'Proper' motor repair
Government regulations
The cost of competition
IoT in factories



Poised for growth

How Georgia's Industrial Repair Service manages its expansion and its employees' expertise



Mike Emmons at his desk in the robotics laboratory of IRS Atlanta. Emmons, test systems engineer-HQ, is the resident innovator of the lab, constantly experimenting. "I was born to play with electronics," he says. "I always liked to design and make things."

By Charlie Barks, EA Assistant Editor

CUMMING, GA.—Georgia pines line the highway north from Atlanta to the headquarters of a different IRS: one for whom you would actually delight in picking up the phone.

Industrial Repair Service's Cumming, Ga., site acts as the nerve center of the company's operations. Parts orders must be cleared through Atlanta, as do any major business decisions. Distinctions of this service company are its laboratory setups, 24-month warranty service, and business structure.

Its specific labs for servomotors, mechanical, robotics, and wind turbines are focal points, which *Electrical Apparatus* took a look at while visiting the Georgia headquarters. The company has four more labs devoted to metal detectors, a-c and d-c drives, servo systems, and electronics. Its applications over the years have covered various manufacturing industries such as plastics, steel, printing, automotive, furniture, wind power, rubber, refineries, and water treatment facilities, among others.

IRS began in 1990, primarily through the foundation of owner/CEO James Doyle and operations manager

Mike Yard. As Yard explained to *EA*, Doyle had a small company and an opportunity to help it grow. He connected with Yard, who had worked for a direct competitor out of college, selling products that IRS repaired. Recognizing that IRS also made components, Yard says, he was familiar with its owner. He and Doyle agreed that it seemed to be a good fit and a promising opportunity to team up.

"I started out selling for him; soliciting repair business," Yard says. "As we grew, he brought me inside to run the operations side of it. He focused more on the financial side, and it's stayed that way. He's very financially savvy. Our skill sets complement each other well," Yard says of Doyle. "[James] handles half of the business, and I dabble in pretty much everything, jumping between sales and operations, and try to balance my time between the two."

Organizational structure

The company's growth has been steady since the early 90s but has seen a particular spike in terms of service area and geographical presence in the last four years. Since the 2014 addition of its Dallas area facility, IRS has

added satellite repair facilities in Chicago, Phoenix, and St. Louis. Strategically, these are all located just outside the major cities to enable maximum profitability. The Dallas site is in Farmers Branch, just north of the city and a stone's throw from neighboring Fort Worth; the Chicagoland location is in Elk Grove Village (see the sidebar on page 31 for a look at this facility); the Phoenix outfit is in Apache Junction, due east of the city.

St. Louis, the company's most recent addition, was officially launched last month. The advantage to this geographical alignment is simple: to be able to provide service for both major urban areas and their surroundings while also having room to spread out and expand if necessary. It's just one of many organizational details that facilitate continued success for the company.

IRS, with more than 100 employees, has also made a concerted effort to integrate smart business structure with its quality services. For Yard, who oversees all hiring and operations from the Atlanta nucleus, this means having a distinctive inside and outside sales staff who understand their vitality, feel rewarded

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POISED FOR GROWTH *continued*

and important, and have a collective philosophy of bringing quality, expertise, and reliability to the customer. It also requires an experienced technical staff (divided efficiently by the aforementioned repair laboratory structure) that delivers quality repair in efficient turnover time. The lynchpin of these two entities comes from Yard himself—and Colleen Voisin, the marketing and communications director at IRS, who acts as a liaison between the two groups.

“I have a department head in every single department other than outside sales who reports directly to me,” says Yard, who has experience in sales himself from early in his career. “I balance my time between managing the managers of each department. Then I’ve got stand-alone departments; like Colleen is marketing manager but also manages herself. Fortunately, we’ve got really good people.”

The personal handling of outside sales intersects with Yard’s outlook on hiring. “Out of the 15 or so people we have, a lot of my outside staff—probably nine or ten of them—are seasoned. They don’t need to be chased, they don’t need to be told what to do. It makes it a lot easier. If there’s one thing that we’ve improved by leaps and bounds, it’s hiring. More in particular than I think in any business.”

Yard and Voisin are also in constant communication. “There should be a window right here,” Voisin jokes, indicating the wall between their offices.

The subtleties of shop talk

Voisin has made an effort to learn as much as possible about the industry she works in, something not viewed as a requirement for other marketing directors. Some people think that if you have the communication skills, have a basic understanding for emerging markets like social media, and, say, know

how to make a website presentable, then you give your company adequate presence and exposure. Both Yard and Voisin know that this approach is leaving money on the table.

“Coming in from a marketing standpoint, the website was basically product-based when I first got here,” Voisin explains. “You have to communicate [those products] to your audience. Working with Mike, we were able to say, ‘how am I going to understand it? How is the customer going to understand it?’” Voisin suggested they compartmentalize the website and give it a bit more customer relatability. This led to detailed inclusion of all the company’s labs and services, in a fluid and customer-friendly presentation. “It definitely helps when you try to break it down as far as possible to a component level,” Voisin says.

This encompasses a breadth of terminology that needs to be considered separately for technicians, salespeople, and customers individually, according to Voisin. One of her most important contributions to the company has been identifying these variations in terminology and interpreting them to all branches of the workforce, as well as the customer base. “When I first got here, I realized there were differences in language that are subtle, but so important,” she says. “Some people don’t have the time to devote to learning these. We’ve found it’s really beneficial.”

That nomenclature analysis, for instance, has produced in a big way. Management, sales, and technicians have worked together to connect all groups on that front, realizing small things like the difference between “inverter” and “converter” when applied to wind turbine repair. While both are electrical devices that convert current, converters convert the voltage of an electric device, usually a-c to d-c.

On the other hand, inverters generally convert in the reverse. Yard found that this distinction is so easily understood by technicians and industrial workers that it often goes overlooked. “We just opened a wind division in Abilene,” Yard says. “At one point they carried me out to some of the wind farms. It was shocking because the verbiage is different, but the product is basically the same. They call it a converter. It’s an inverter on the industrial side. It’s the same product. We’re just scratching the surface on it at this point,” he says of IRS’s wind power division.

Voisin, for her part, says realizing this distinction—along with doing a little extra legwork to reach the wind farms themselves—opened up a market that



In the robotics lab, IRS has multiple configurations for the test and repair of PLC, Siemens, and CNC machining systems, able to repair, inspect, disassemble, and rebuild robots.

others overlooked. Other differences in terminology exist in abundance: “valve” could apply to anything that includes a valve, such as “pumps” or “hydraulics,” “cooling” or “modules,” depending on geography, whereas “winder” and “technician” are interchangeable elsewhere but distinguished at IRS. Think of food and drink terms akin to how southerners will often use “Coke” to refer to any kind of carbonated soda. *EA* Engineering Editor Richard Nailen has addressed these distinctions in “Say it Right” over the years.

Back to the lab

Head technicians and their staff in specialized repair labs contribute to this success. It’s not the first time a repair business has designated areas of repair to different products, but there is something beneficial about clean organization. On top of this, a more unusual aspect is the breadth of apparatus IRS is able to service—all with high quality and attention to detail—through the calculated structure.

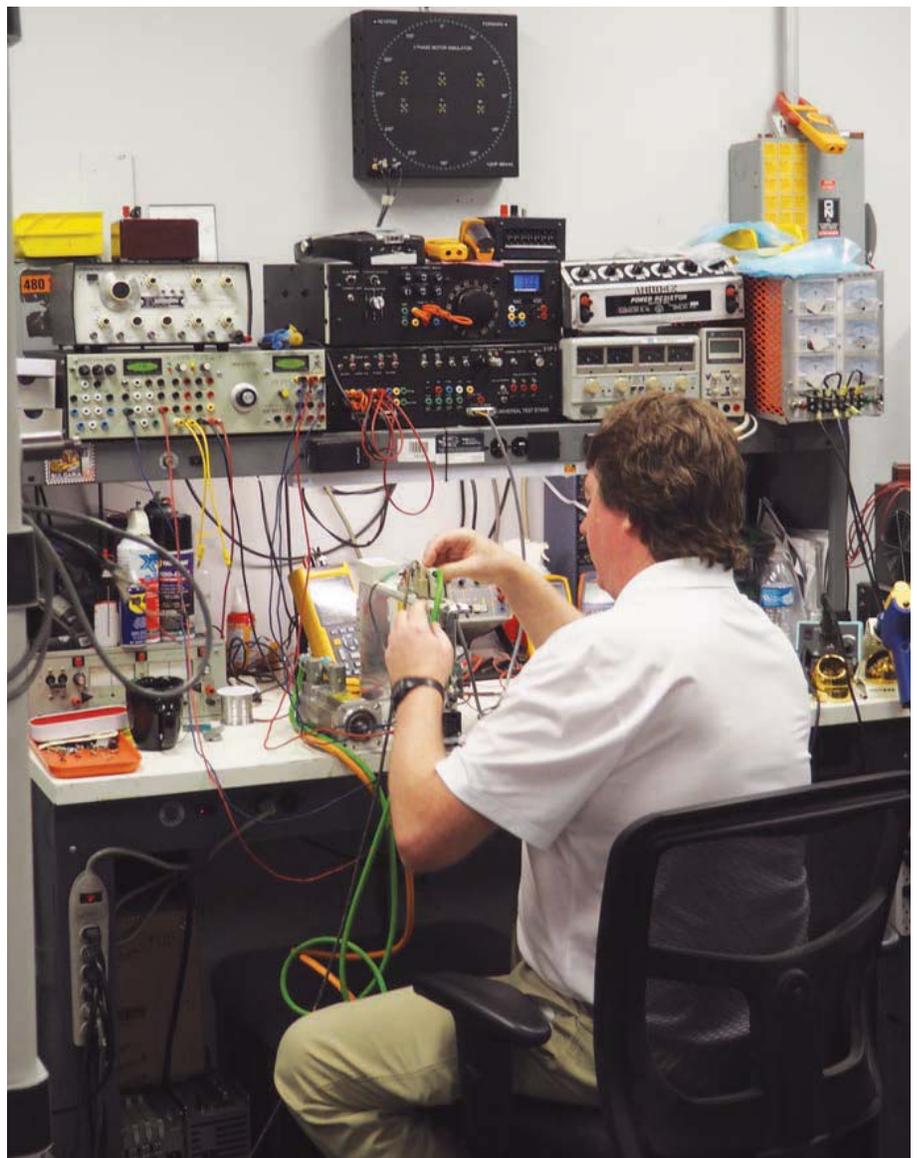
In the servo lab, you’ll find experts on any device with feedback. The mechanical lab is home to two pump experts with a combined 50 years of experience. The robotics lab features a trial-and-error setup that yields test results for both immediate purpose and down the road. Wind turbine testing is simulated in a lab that’s able to replicate the actual force and conditions of those at wind farms.

Randy Ford, mechanical lab manager, explains that his duties go beyond the parameters of traditional repair. “We’re more restoration than repair. Some things we get in here—like a pump gridlock that was buried in the ground—we bring it back to life.”

The mechanical lab services hydraulics, wastewater treatment equipment, including blowers, vacuum pumps, cylinders, re-circulators, and more; its technicians stress that the lab isn’t confined to just one thing. Mechanical lab technician Mike DiGiovanni and Ford both have experience in the maintenance field, a benefit due to the fact that they’ve seen components at work and know the purpose desired by the end-user. Both technicians say it’s helpful to be able to picture the part on the machine, having “experienced it firsthand from the other side.” The two have a combined total of over 40 years of maintenance work between them, including ancillary experience in steel and fabrication.

“It feels good when you can take something that may look like it was in

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Mike Emmons works at his desk in the robotics laboratory. “Robotics is more about positioning control,” he explains. “There are different coordinate systems to move on.”



A view from the motherboard: One of IRS Atlanta’s test areas. This particular section is home to “Big Blue” (seen back right), a setup capable of replicating wind turbine loads.



Organization is key in the servomotor lab work area. Five employees work in this department, focusing on alignment, winding analysis, and testing of devices with feedback.

POISED FOR GROWTH continued

the ground and refurbish it, and now it's a working component," says Ford.

Quality, warranted

All of IRS's technicians also expressed gratitude for the company's warranty offerings, saying both the 18-month and 24-month tiers give their clients an added element of confidence. The 24-month warranty, implemented at the beginning of 2018, is a rarity in the industry.

Most repair operations offer a 12 or 18 month window. Not only that, but IRS uses the 24-month warranty to great effect.

The warranty starts only when a part is used in the machine, as opposed to when shipped back to the client. This

allows the client to deploy its repaired machinery only when it is ready, without having to consider warranty months being eaten up. It could be kept in storage without heightened risk. The warranty also covers the entire unit, rather than merely the parts that were serviced or replaced. Average turnaround is approximately 7-10 days, with 24-48 hour rush service available.

IRS offers emergency and onsite field capabilities where applicable. Plants, specifically, have appreciated these features of the warranty, IRS management said.

The recently implemented 24-month tier is currently available exclusively for electronics repairs. Meanwhile, the 18-month tier is applied to mechanical, robotics, and servo motors.

"We deal with any kind of motor, but we specialize in motors with feedback," says Todd Benivegna, manager of the servo motor lab at IRS Atlanta. This department, which comprises five employees, involves alignment, winding analysis, bearing and power supplies, scopes, and testing. About half of its work comes from the food processing industry. Benivegna estimates the lab's volume of orders to be an average of five to ten per day. "It fluctuates, and comparatively, for some other operations that I've seen, we do a lot. We focus on quality."

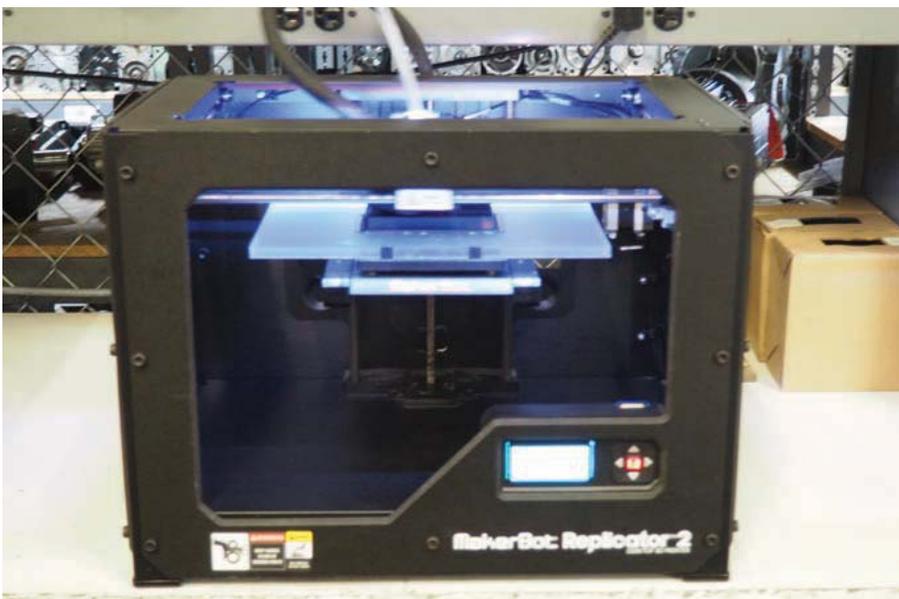
Each motor gets a detailed data sheet that has contributions from the customer and IRS. The customer may include known treatment history of the motor, the initial problems that required service, and brand identification, if that customer has time and the desire to do so. IRS then provides information not only about the motor itself (whatever is still needed regarding manufacturer, industry, age, and use) but also about its alignment, voltage, and treatment history. "We have a hard copy and a digital copy, and we're able to search through those," Benivegna says. "One of the keys of what we do is making sure for any other motors that come in, we can reference the historical archives."

"[The archive] helps the customer," Benivegna continues. "If there's an issue—and believe me, it happens when a customer sends in something and they're not sure what the alignment is—we're very confident that our data is correct, and we can apply that accountability. We're always trying to rule out the unknown. We try to stay organized, in a routinized way. When you're working with high-strength magnets, that's my philosophy."

Every incoming item is scanned by barcode, allowing it to be carefully tracked whether on the shelf, at the workbench, being tested, or elsewhere. That location is also tied to a status, so as an item comes in the building and is moved around the shop, its location and status change simultaneously. Motors waiting for parts are scanned and organized to a specific shelf and location. Technicians change the job electronically to "parts needed" status. That cues another department to follow up by showing up on its "incoming jobs" list.

Following repair and testing, customers can sign up for an online portal allowing them to track a job through the system. "They can track it from the time it's logged in to when it's returned, repaired, and shipped out, all the way

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A 3-D printer is used at the Atlanta location to make custom parts. Servomotor lab manager Todd Benivegna describes the device as efficient and versatile.

Clear skies and smooth cruising ahead



IRS's Elk Grove Village shop employs four and covers much of the northern Midwest.
—*Electrical Apparatus* photo by Kevin Jones

ELK GROVE VILLAGE, ILL.—If you really wanted to, you could stand outside Industrial Repair Service's shop northwest of Chicago and watch planes take off and land at O'Hare International Airport all day long.

The shop lies less than a mile from the northwest corner of Chicago's primary airport, one of the world's busiest. The shop is next to the airport not so much to ease the shipment of products as to facilitate the movement of people.

"We may have customers come in to visit," explains shop manager Adam Kuehl. "Or we may have in-house sales people come in from Atlanta" to visit customers in the region.

The Elk Grove facility is one of five operated by Industrial Repair Service. The others—apart from the headquarters in Cumming, Ga.—are in Apache Junction, Ariz., Farmers Branch, Tex., and St. Louis.

It comes as a surprise to many that Elk Grove Village is among the busiest industrial zones in the U.S. In an industrial park almost six square miles in area, there are nearly 3,600 businesses here employing about 100,000 people.

For transporting products to and from customers—as well as to and from headquarters in Georgia—the Elk Grove Village branch relies primarily on its three drivers and on FedEx.

One of these drivers covers the territory from northern Illinois into Wisconsin. Of the other two, one is "kind of a roamer," Kuehl says, while the third covers Southern Illinois and parts of Indiana. "A couple of times a day, a local customer will come in and drop off their own stuff," Kuehl says.

Four people, including Kuehl, work at this location, covering one shift per day. There aren't any account managers here yet, but one was set to begin working the week after *Electrical Apparatus* visited in early March.

The Elk Grove shop opened about three and a half years ago. Kuehl was hired at that time to get the shop up and running. "I was all by myself for about three months," he recalls. "I was doing shipping, receiving, repairing, customer service—a bit of everything."

But that was then. Now, "we're getting aggressive about expanding this shop," Kuehl says. "We're bursting at the seams, so we're definitely looking to relocate." The company is also looking to expand its services. Wind power, for example, "is a big-time opportunity," says Kuehl.

The Elk Grove Village shop doesn't offer the entire suite of services offered

by Industrial Repair Service as a whole. Jobs that Elk Grove isn't equipped to handle are shipped to headquarters.

The items repaired at Elk Grove include a-c and d-c motor drives, PLC controllers, various types of power supplies, IO cards, circuit boards, timers, and counters.

"We don't repair motors, pumps, or valves," Kuehl explains. "We ship those to Atlanta. If we move to a larger facility, hopefully we'll be able to do motors."

So instead of handling all jobs itself, this shop, like Industrial Repair Service's other branches, is focused on serving a particular geographic region. This is not a situation in which each location has a specialty that it shares with others. If there's a need to order parts here, the order will be put "through Atlanta."

Given the breadth of the company's national footprint, the U.S. is pretty well covered. The Phoenix location, for example, covers the West Coast. "Dallas gets a chunk," says Kuehl. "St. Louis will get a chunk of the Midwest. We get a chunk of the Midwest."

Atlanta is the hub of the wheel, so to speak. The several locations deal with Atlanta, not with one another.

By this means the company intends to grow—and not just the corporation as a whole, but each individual branch. "We hope eventually to get as much test equipment as they have in Atlanta," says Kuehl. The objective is "to make it more convenient for the customers as far as having things done locally and having a faster turnaround time."

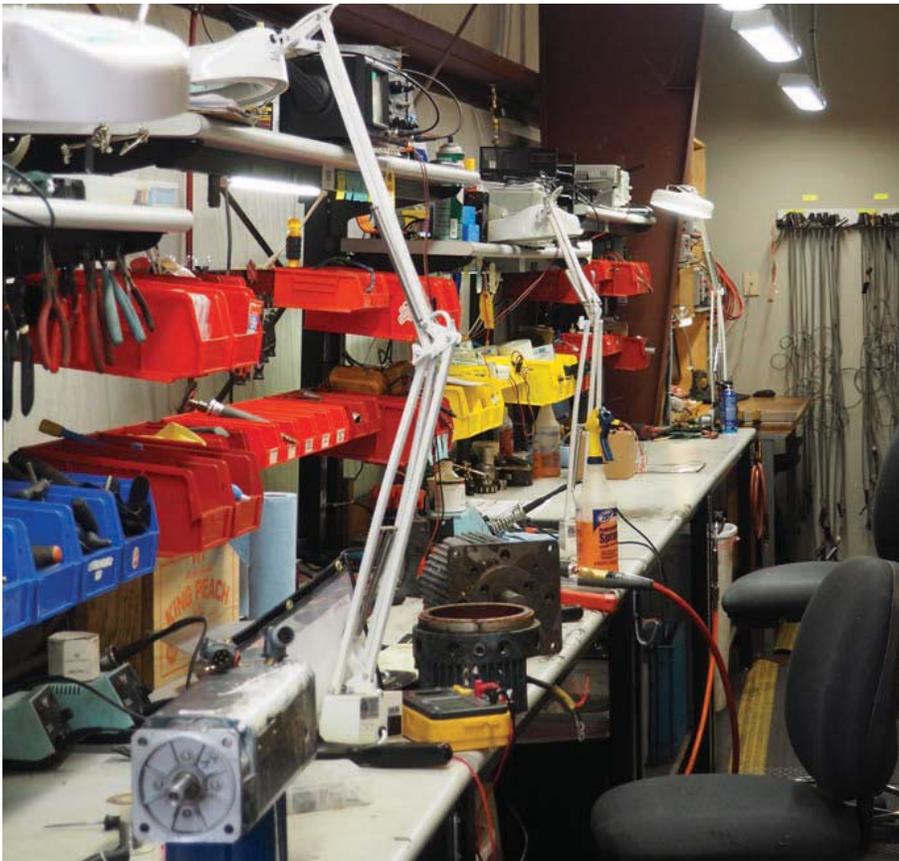
At several places on Industrial Repair Service's website, the point is made that repairing electronics is often a better alternative to replacement. This is a principle that appears to be lasting longer in the electronics than in the electromechanical realm, where motors of ever-higher horsepower are becoming disposable.

In the area of electronics, repair is firmly established for companies with the tools and expertise to offer it. "I don't think it's going to go anywhere soon," Kuehl says of electronics repair generally. "Even with the progression of automation, we still see boards that are 30, 40 years old."

So like the aircraft taking off at nearby O'Hare airport on the sunny day *Electrical Apparatus* visited, Industrial Repair Service appears to have clear skies and smooth cruising ahead. As Adam Kuehl says, "there's always going to be something to repair."—Kevin Jones



Adam Kuehl has managed the Elk Grove Village shop since the facility's opening more than three and a half years ago.
—*Electrical Apparatus* photo by Kevin Jones



The work bench in the servomotor department at IRS Atlanta. Although it fluctuates, employees estimate the lab's volume of orders to be an average of five to ten per day.

POISED FOR GROWTH continued from 30 through the process. That's something new that we implemented," Benivegna explains.

A versatile staff

As with many businesses, the more versatility you have with staff, the more potential you have for growth. For example, while IRS is home to some highly specialized technicians with expertise in one or two areas, it also has a number of employees with umbrella knowledge of different fields and equipment, allowing them to circulate through the company and shore up all fronts. Voisin is one of those individuals, as is Tommy Duckworth, who holds title of Shop Manager-HQ but presides over work in all of the following labs: Wind, Robotics, Electronics, Metal Detectors, and Drives.

Duckworth explained to *EA* how new technology has found its way into IRS's operation. Improvements in the drive testing department include a four-camera system that links directly to IRS's private YouTube channel, allowing the customer to stream live video of their equipment being tested. (This is done via the "video manager" setting on YouTube, where a privacy drop-down menu allows an option for a "share" function to add e-mail addresses of the customer. Users will then get an email with a link

to the video stream.) This test area applies to a wide range of equipment from VFDs to wind turbine components.

You might be trying to picture how a repair shop tests wind turbine equipment. Without having to bring in the actual blades, which are far too large in both diameter and weight, the way to efficiently manage turbine testing is to test the components. "We know the inner workings of them, how they operate," Duckworth explains: "From the blades and the low-speed shaft to the gearboxes and the high-speed shaft generators. At



"Big Blue" is a 280 amp, 480 volt-in load bank, used to test everything from VFDs to DC drives to wind turbine components.

the load center, we can actually load test up to 250 HP, and it's integrated with the four-camera system, which is great. Customers love it."

The robotics lab, according to Duckworth, is still in its infancy, but all the more promising for it. This lab is closely tied with the servo area in that it uses servo components to build robots. Mike Emmons, Test Systems Engineer-HQ, is the resident innovator of the robotics lab. "I was born to play with electronics," he says. "When I was five years old, I was building erector sets and hooking up motors and batteries. I always liked to design and make things."

Robots comprise both mechanical assemblies and electrical components, including hydraulics, servomotors, encoders, wiring harnesses, printed circuit boards, harmonic drives, robotic wrists, and teach pendants. IRS is able to do comprehensive repair service aimed at inspecting, disassembling, rebuilding, and repairing the complete robot, its components, or just a subassembly to find the performance issues. The robotics team can service and repair multiple industry-leading OEM robots "as well as generations that are often obsolete," says Emmons, who went to an industrial electronics design school in North Druid Hills, Ga., in 1981. His professional experience began in consumer electronics but matured into the fields of aviation and robotics over the years.

"Robotics is more about positioning control," Emmons explains. "You have different feedback loops. You'll have speed loops, you'll have torque loops—which is your current—and then you have positioned feedback so they will always know exactly where it is. If the robot wants to go [in a certain direction], it will sense where it's located compared to where it wants to be and then give itself a signal to move in that direction. It knows when it gets to that position. And there are different coordinate systems it can move on."

Now, not everyone has the time to make site visits to, say, Thunder Ranch Wind Farm in rural Oklahoma or set aside an additional 30 minute block intended to learn technicians' slang. Likewise, your operation might not have the freedom or capital to compartmentalize various labs of such detailed regulation. Executives like Yard and Voisin have certainly worked hard and thought outside of the box, but the operation wouldn't boast the steady growth it's had since 1990 without quality technicians, who refer to one another as "some of the best in the world." **EA**