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## Developing Electronics, Driving the Economy

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# Developing electronics, driving the economy

How the Electronics Design Laboratory turns to technology to help research, industry



*Timothy Sobering*



For the engineers in the Electronics Design Laboratory at Kansas State University, each day brings something different.

They have tested components for an experiment at the Large Hadron Collider at CERN and developed a set of sensors for a team of veterinarians to measure equine intestinal muscle activity. The team is also working with nuclear engineers to develop neutron sensors that could be used in monitoring cargo at ports of entry, assisting with disasters like the Fukushima nuclear plant accident or protecting military personnel on the battlefield.

The subjects vary, but the laboratory's focus remains the same: Help scientists and industry around the world acquire accurate data.

**“We help researchers get the information they need,” Sobering said. “Why should biologists or chemists have to be experts in electronics in order to do what they need to do? They don’t have to be, because Kansas State University chose to go forward with this laboratory.”**

The laboratory team — composed of Timothy Sobering, laboratory director; Russell Taylor, electrical engineer; David Huddleston, technician; and two students — develops electronics not only for Kansas State University researchers, but also researchers at other universities as well as industry members.

The engineers have the resources and skills to create a variety of electronics: sensors, data acquisition systems, control systems and commercial equipment. To meet budget and schedule needs, they also repurpose old equipment to meet current standards.

In its 15 years, the laboratory has completed nearly 400 projects, some of which have achieved commercial success.

A partnership with the university's Advanced Manufacturing Institute helped a Kansas entrepreneur develop a digital brake controller for large hauling trailers, making it safer to drive with loads of varying weights.

Taylor recently completed a project with Honeywell and developed a low-powered, high-memory system with a USB connection to easily download data. For a project with III Sigma, the engineers helped develop a probe that measures the moisture content of bulk materials, including food, which is an important step in product quality control.

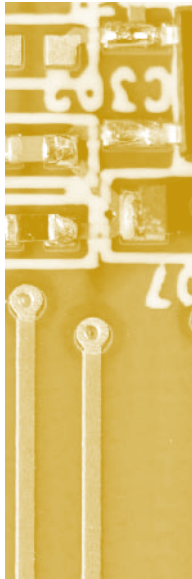
The engineers also worked with grain scientists on a device that prevents insect repopulation in grain bins by producing ultrasonic noise at varying frequencies.

**“You use less fumigant and less chemicals, so it’s cheaper for the farmer and better for the environment and the consumer,” Taylor said.**

Other collaborative projects have included the University of Kansas, the University of Tennessee and the University of Missouri, among others.

Sobering has noticed other universities developing similar laboratories, showing how Kansas State University was a leader in forming electronics laboratories that contribute to research success and the commercial success of partnering with industry.

**“Research is evolutionary,” Sobering said. “You don’t dive in at the end of it; you go through a process and learn along the way. This is why we learn as much from our partners as possible so we can provide them with the best product based on our skills.”**



The Electronics Design Laboratory has developed a variety of projects, some of which include:

- Creating a microfluidic system used in microgravity experiments conducted on NASA's "Vomit Comet."
- Collaborating with veterinarians to develop a wireless network for remote monitoring of bovine animal health.
- Working on neutron detectors with researchers at the Semiconductor Materials and Radiological Technologies, or S.M.A.R.T. Laboratory.
- Supporting the design and testing of compact radio systems for use in planetary scout-type applications, such as rovers and short-range probes to Mars.