

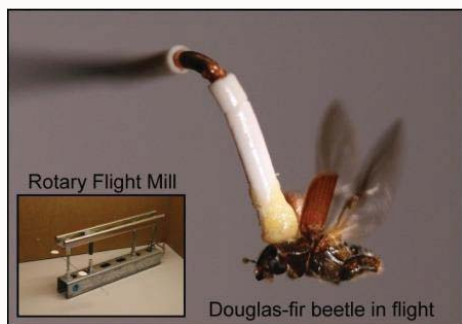
Instrumentation Specialists Support COAS Research

by Andrew Cornell

The College of Arts and Sciences employs a pair of specialists who can design and build custom instrumentation and lab equipment to support COAS research. These specialists provide technical support and direct new research equipment installations. If researchers need custom instrumentation to monitor and record the speed and distance of Douglas-fir beetle movements, they have a resource to consult. If researchers need a large instrument installed, the specialists will direct the electrical and mechanical design of its installation. These specialists manage the COAS Scientific Instrumentation Shop. Their names are John McDonald and Randy Nuxoll.

Scientific Instrumentation Shop

McDonald and Nuxoll are technical support specialists and patent-holding inventors. They can design, engineer and build custom scientific instrumentation upon request. Their projects range from large complex process and control systems to small specialized instrumentation probes. A sample of successful projects includes the following: (1) a large solvent purification system for the chemistry department, (2) the rotary flight mill to monitor the Douglas-fir Beetle and its flight patterns, (3) a photo sensor array grid system to monitor the movement of caged owls to test the effects of a new hormone on nocturnal activity, and (4) special instrumentation probes for the COAS nuclear magnetic resonance (NMR) spectrometers.



Rotary flight mill developed for BSU research

McDonald is the electronics specialist who will design and layout the electronic circuits. Nuxoll is the mechanical

specialist who will design and machine the precision parts.

The instrumentation shop is located in Room 152 of the Science/Nursing building. A walk into their shop reveals a variety of rooms filled with machines. The machines are used to cut, weld, and form a variety of materials, including metal, plastic, and wood. John's office and electronics lab is in the back corner room. The lab is where circuits are designed and lab equipment is built and repaired. Nuxoll and McDonald diagnose and repair all kinds of COAS equipment reported to be damaged or inoperable.

A faculty member requesting support on a project can simply walk into the instrumentation shop and talk about an idea or a problem. Sketches, notes, and a budget also help. Once McDonald and Nuxoll understand what is needed, they will propose a solution and then begin work upon receiving approval.

Specialists Reduce Costs

Researchers can save money by using the full service custom instrumentation shop.

McDonald and Nuxoll can show several examples of their work that saved researchers money. Two examples include a cable assembly for Antarctic research and a glass blower for the chemistry department. At a cost of \$200, McDonald designed and built a custom ground penetration radar cable for a geoscience project involving glacier hydrology. Without the shop, a researcher would have to purchase a built-to-order \$10,000 cable from an instrument vendor.

As a team, McDonald and Nuxoll designed and machined a glass blower that will allow the chemistry department to create their own custom test tubes from stock lengths. Instead of purchasing standard test tubes at \$15 per tube, the chemistry department can now make their own custom test tubes.

Many universities have funding to support a single instrumentation shop for each department within a college. By supporting all departments within the college, the instrumentation shop supports all areas of COAS research.

Instructors Benefit from Tools

The technical support specialists also design and build educational tools for all departments. They can design and build devices used to improve student learning. These include visual devices used to improve student learning in optical physics and mechanical devices used to improve the learning experience for disabled students.

Specialists Manage Equipment

If new equipment is scheduled to arrive in the building, both McDonald or Nuxoll can work with contractors and prepare a site for equipment installation.

Specialists Support Lab Facilities

The shop provides liaison support service between the research laboratories and the building facilities. If a problem occurs with lab equipment due to problems with electrical systems, exhaust and ventilation, refrigeration, or water purification, then McDonald or Nuxoll will address it.



Randy Nuxoll (left) and John McDonald

Profiles

John McDonald's tenure with Boise State University spans 22 years. He began as a special lecturer in the physics department and later opened the Scientific Instrumentation Shop to support the first (300MHz) NMR spectrometer.

Randy Nuxoll is a mechanical instrumentation specialist. His tenure with Boise State University spans eight years. His background includes experiences ranging from logging to aviation mechanics.