

# ECTRONICS

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From the CEO:

Happy holidays to all of the Ectron Sales Team! The year is almost over, and I am sure that most of us will be glad to turn the page. Ectron's business was off this year. It has been one of the roughest years I can recall. But we survived! I hope all of you have hung in there just like us and are ready to move forward into 2010. Better things are in store for us.

We see some good signs in the auto industry, and defense spending remains steady.

The brightest spot we have is the new Model 1140B for the U.S. Air Force. We will begin shipments in January 2010, and will migrate many of the 1140B features into an improved version of the Model 1140A that you can sell to everyone. Top among these is the data logging feature in meter mode. The new 1140A will also have a rechargeable battery, a carrying case, and a calibration test kit as options. So go get orders for this thermocouple simulator-calibrator. It is the best unit on the market without question.

I pray for your success and joy in the New Year.

Sincerely,



E. Earl Cunningham, President and CEO

## Ectron begins shipments of 1140B units to the U.S. Air Force

Shipments of the new Model 1140B to the U.S. Air Force Metrology and Calibration (AFMETCAL) Program in Heath, OH will begin in early January 2010. Ectron has ramped up the initial production units for Air Force inspection. Once approved, the deliveries will accelerate in Q1 2010. This is a very exciting development for Ectron. The new unit has a USB interface, a 1 MB data logging feature (in meter mode), and a rechargeable battery as unique features. There is also a calibration test kit and a carrying bag to make the unit portable for field work. Battery life is typically 6.5 to 8.5 hours. In the labs, we had batteries that worked for more than 12 hours. The best news of all for 1140A customers is that in the new year, Ectron will migrate all of the features of the special Air Force unit into a "new" updated version of the Model 1140A for all customers. Stay tuned for these developments and the new pricing for these optional accessories.



## *Ectron Product Application: LVDT Conditioning at Universal Studios*

Ectron's Model 451 LVDT/RVDT Signal Conditioners were employed by Universal Studios in Orlando, FL to give position information of the cars to the controller system and to ensure the safety of the riders on these cars. The *Amazing Adventures of Spider-Man™* ride resembles a flight simulator which rises, falls, pitches, and swirls with a lot of g-force and speed to give the rider an exciting physical experience. Of course all riders are strapped in securely to their seats as they weave their way through a dark maze of alleys and buildings following Spider-Man™ as he chases down the villains like Dr. Octopus, the Green Goblin, and Hydro-Man.

The Model 451's role in this application is to precisely measure the physical displacement of each of the Moog actuators as they rapidly drive the attitude of the car and provide the physical impetus to the car above. Sensing the specified physical travel is vital signal information fed into the PLC controller on-board each car. Should an actuator exceed its travel limit, an emergency shut-down is triggered to prevent accidental injury to riders, and to insure equipment safety.

Each car uses six of these drive pistons to create its wild gyrations. Each piston has an LVDT to monitor the ride's exact position and give feedback to the ride's controller. Since the ride was made for up to 15 people it was a heavy car so the drive pistons required a great deal of force.

Among the problems that the LVDT conditioner had to endure were poor EMI conditions as well as the vibration and shock present on the car. Adding to these problems was high temperature present in the electronics bay and a noisy dc power source. Small size and rugged construction was also a requirement. Therefore the Model 451 was an ideal match for this application.

Using the Example Mode, setup of the LVDTs to the Model 451s was a simple 30 minute job. This is in contrast to the previous conditioners which required a 6-8 hour long calibration procedure for the 6 channels. Obviously this is another significant plus for the Ectron Model 451.

Since there are many, many rides like this in the many theme parks around the country, there are many, many potential applications for the Ectron Model 451 LVDT/RVDT signal conditioner. Although this application was to replace existing LVDT conditioners, the design of new rides is frequently outsourced by the theme park to companies devoted to this business. Some of these companies are [Chance Morgan](#), [A Basic Service](#), and [Totally Fun Company](#). A Google, Yahoo, or Bing search will find theme park designer companies in your area. You already know where to find your local theme parks.



Moog actuators attached to Spider-Man ride.



Karl Cunningham, VP of Engineering for Ectron, at work with Model 451 and E408-6Y enclosure.



## *Personnel Announcements*

### Ectron Employment Anniversaries

Pete Argueza – Production, 30 years  
Lynn Duong – Production, 5 years  
Roger Elswood – Production, 30 years  
Susan Walsworth – Finance, 19 years  
Fred Schultz – Test, 32 years  
Diane Miller – Sales, 27 years

## *Sales Representative Awards, Calendar Year 2009*

### U.S. Rep of the Year

Tritek Solutions, Inc.  
Dan McAneny (California)

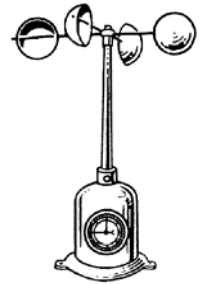
### International Rep of the Year

Pyrodynamics – India  
R. Suryanarain

## *Tech Tips: Did You Know...?*

*Accelerometer* – A transducer which measures acceleration and/or gravitational forces capable of imparting acceleration. Two common types of accelerometers are those that use the piezoelectric effect and those that use the piezoresistive effect. Ectron amplifiers work very well with the latter type but require special adaptation when operating with accelerometers using the piezoelectric effect.

*Anemometer* – An instrument used for measuring the force or speed of the wind. Typically these instruments produce a pulse output and therefore can be used with the Ectron Model 441A tachometer/frequency-to-voltage converter.



*LVDT* – Linear variable differential transformer. An electromechanical transducer that continuously translates displacement of position into a linear ac voltage. Ectron's Model 451 can condition an LVDT or RVDT and then amplify the output from the sensor. Fast set-up and precise output are features of our Model 451.

*RVDT* – Rotary variable differential transformer. An electromechanical transducer that continuously translates angular rotation into a linear ac voltage. Ectron's Model 451 can condition an LVDT or RVDT and then amplify the output from the sensor.

*Strain gage* – A resistive transducer whose electrical output is proportional to its deformation under strain. Also, a measuring element for converting force, pressure, tension, etc. into an electrical signal. All Ectron conditioner-amplifiers (Models 352, 428, 563, 753, and 778) can condition and amplify the output of strain-gage load cells.

*Thermocouple* – Temperature transducer comprising a closed circuit made of two different metals. If the two junctions are at different temperatures, an electromotive force is developed that is proportional to the temperature difference between the junctions. This is called the Seebeck effect. The Ectron Model 200 can provide reference-junction compensation so that the following Ectron amplifier can precisely amplify the signal. Of course, the Model 1140A thermocouple simulator-calibrator can precisely calibrate any thermocouple measuring instrumentation.

