Special Thanks to Agilent Technologies For Sponsorship
Award Winners

Michelle Lum
Jonathan Yuen
Chris Cinkornpumin
Jonathan Chan

Energy Harvesting from Exercise Machines
Award Winner
Matt Thayer
Award Winner
Robot Controller

Darren Baida
VIASAT-SPONSORED PBLI PROJECT
IFF Transpond Decoder

Robert Oxsen
James Watt
Jason Lincoln
Wesley Liliental
Headway Technology Sponsored PBLI Project
- 3GHz anti-phase amplifier design

Juan Gomez
Richard Margarito
Octavio Rico – Fiber Optic Interrogation Project
Vincent Bottoni and Frank Belloci
Line Protection Relay
VLSI Stability Detectors

Adam Jacovitz
Clay Hadick – Braking Indicator
Kendall Loebakka – Patent Investigation
Jeffrey Azavedo
DMX Controlled Slide Show Trigger
Theda – DC Chopper for Electric Speed Control of a small off-grid Wind Turbine
Summary

RFID

For IBM Hard Drives

By Jonathan Flutts

System Overview

Problem

Passive RFID tags are not designed for application on metal surfaces. Incident and reflected waves cancel out, and there is not enough energy to power the tag.

Proposed Solutions

An experiment was simulated by placing several disk drives close together inside a metal case. Dielectric with high permittivity was ruled out because of cost-effectiveness - cost was quoted at $84.05 per drive. Allen Squiggle tags with foam spacers were compared to Omni ID tags, which are specifically designed to work on metal. Two categories tested:

- Low profile: Squiggle with 1.18" spacing and Omni Flex
- High performance: Squiggle with 1.74" spacing and Omni Pro

Results

Tag Characterization

Conclusion
Justin Rucker

RUCKUS
BASS
PEDAL

by Justin Rucker

The technology involved with sound effects has revolutionized modern music. Adding aspects to the sound of an instrument can create a whole new world of experience that a musician is able to explore. One particular application of sound effects is the use of a boost box. A boost box is a device that takes an input signal from an instrument and create a louder sound effect based on the input. There are two output signals to an amplifier.

A common sound effect called a "Puerto Rico" is most common for the electric guitar. A boost box can be used to make the sound louder and more distorted. This effect is most common for the electric guitar. A boost box is a device that adds a boost to the input signal. In this application, a boost effect is added to make the sound louder and more distorted for an electric bass player.
Alexandr Korz – Digital Phosphate Detector with USB Interface For Windows Based PC

Why is it needed?
- Phosphate levels in potato water sources are important.
- High phosphate levels cause hypophosphorylation, which growth beyond what the environment can support.
- Current devices are high cost, not very portable, and sometimes difficult to use.
- Current devices are mostly hardware based, increasing cost and decreasing flexibility.
- Developing nations need low cost, energy efficient phosphate detection technology.

Requirements:
- Microcontroller with A/D and D/A
- Novel method for signal conditioning and amplification (e.g., instrumentation amplifiers, O/P buffers)
- Optimum range with USB interface
- Software to calibrate and read calibration data
- USB-controlled digital signal output

HARDWARE