

TIPS: Debugging & Developing USB Devices
LOCATION: United States
PAGE: 30

INSIGHT: Effectively Predict Product Reliability
LOCATION: Canada
PAGE: 60

PROJECT: Tachometer Design Explained
LOCATION: United States
PAGE: 64

CIRCUIT CELLAR

THE WORLD'S SOURCE FOR EMBEDDED ELECTRONICS ENGINEERING INFORMATION

NOVEMBER 2012
ISSUE 268

ANALOG TECHNIQUES

**Embedded Security:
True Random Number Generation**

**Time Broadcasting:
A GPS-Based Time Server**

**Build an Automated Electronics
Component Dispenser**

**Q&A: The Work of an Aerospace
Engineer & Successful DIYer**

PLUS

Photo-Pal Complete

**The Final Phases of the Camera
Controller Project**

// Software-Defined Buttons

// Parameter Entry

// Timing, Resolution, & Accuracy

// And More

\$9.00US \$10.00CAN



11>

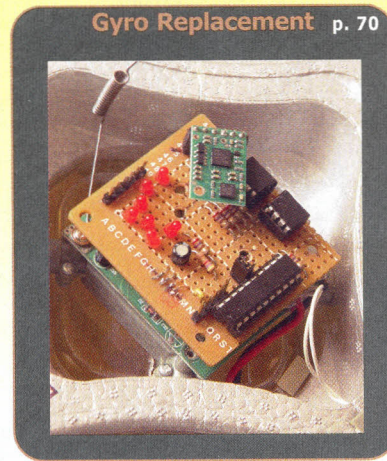
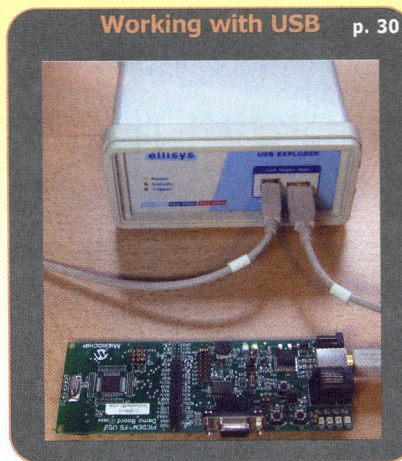
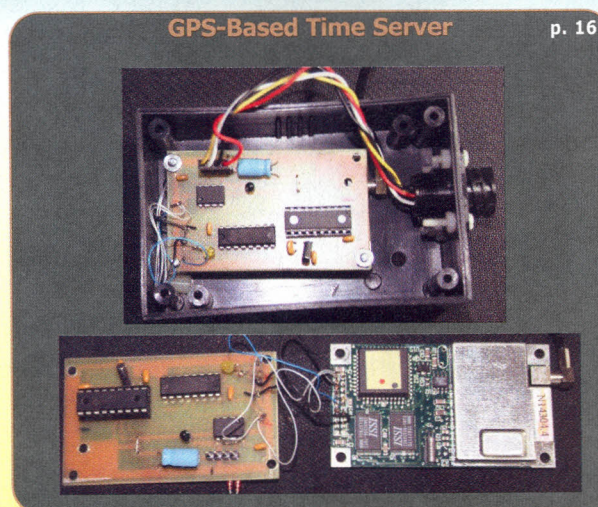
www.circuitcellar.com

INSIDE ISSUE

268

November 2012 • Analog Techniques

- 16 Time Broadcasting**
A GPS-Based Time Server for the RS-485 Network
Scott Weber
- 26 DIY Automated Component Dispenser**
Thiadmer Riemersma
- 30 Debugging USB Firmware**
Tips and Tricks for Developing USB Devices
Jan Axelson
- 36 Digital Camera Controller (Part 2)**
Code, User Interface, and Timing
Richard Lord



- 52 EMBEDDED SECURITY**
True Random Number Generation
Patrick Schaumont
- 60 THE CONSUMMATE ENGINEER**
Product Reliability (Part 1)
Reliability Prediction
George Novacek
- 64 LESSONS FROM THE TRENCHES**
Tachometer Design
George Martin
- 70 FROM THE BENCH**
Mechanical Gyroscope Replacement (Part 2)
Gravity and Acceleration
Jeff Bachiochi

- TASK MANAGER** 2
A History of Improvement
C. J. Abate
- NEW PRODUCT NEWS** 10
- MEMBER PROFILE** 14
- TEST YOUR EQ** 15
- QUESTIONS & ANSWERS** 44
Hands-On Innovation
An Interview with David Penrose
Nan Price
- CROSSWORD** 76
- PRIORITY INTERRUPT** 80
An Internet Education
Steve Ciarcia