

**Issue #286**  
**May**

### **Manuel Iglesias Abbatemarco: Eco-Friendly Home Automation Controller**

#### **PROJECT FILES**

To download the code, go to [ftp://ftp.circuitcellar.com/pub/Circuit\\_Cellar/2014/286](ftp://ftp.circuitcellar.com/pub/Circuit_Cellar/2014/286)

#### **RESOURCES**

J. Celani, "Battery Charger's Unique Input Regulation Loop Simplifies Solar Panel Maximum Power Point Tracking," LT Journal of Analog Innovation, January 2011

E. Chatzikyriakidis, "QueueList Library for Arduino," 2012,  
<http://playground.arduino.cc/Code/QueueList>

A. Rapp, "Arduino Library for Communicating with XBees in API Mode," xbee-arduino, 2009, xbee-arduino, <http://code.google.com/p/xbee-arduino>

Xively, <https://xively.com>

#### **SOURCES**

Arduino Mega microcontroller  
Arduino | <http://arduino.cc>

chipKIT Max32 Board and MPIDE development platform  
Digilent, Inc. | [www.digilentinc.com](http://www.digilentinc.com)

LT3652 Battery charger IC, LT3479 and LTC3112 DC/DC converters, and LTC4411 IC  
Linear Technology Corp. | [www.linear.com](http://www.linear.com)

MCP6001 Op-amp, PIC32 microcontroller, and MCP79402 RTCC  
Microchip Technology, Inc. | [www.microchip.com](http://www.microchip.com)

SIM340 and SIM900 GPRS Modules  
SIMCom Wireless Solutions Co., Ltd. | <http://wm.sim.com>

W5100 IC and WIZ811J Development board  
WIZnet Co., Ltd. | [www.wiznet.com](http://www.wiznet.com)

### **John Peck: An ASCII Command Interface for Atmel's AVR Butterfly**

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#### **RESOURCES**

D. Camera, "GCC and the PROGMEM Attribute," Four Walled Cubicle, 2014,  
<http://fourwalledcubicle.com/AVRArticles.php>

Free Software Foundation, Inc., "AVRDUDE—AVR Downloader/UploaDEr,"  
[www.nongnu.org/avrdude](http://www.nongnu.org/avrdude)

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———, “GNU Make,” [www.gnu.org/software/make](http://www.gnu.org/software/make)

Savannah, “Data in Program Space,” [www.nongnu.org/avr-libc/user-manual/pgmspace.html](http://www.nongnu.org/avr-libc/user-manual/pgmspace.html)

SourceForge, “pySerial,” <http://pyserial.sourceforge.net>.

———, “WinAVR: AVR-GCC for Windows,” <http://winavr.sourceforge.net>

———, “Gnuplot.py,” <http://gnuplot-py.sourceforge.net>

E. White, *Making Embedded Systems: Design Patterns for Great Software*, O’Reilly Media, Inc., 2011

#### **SOURCES**

AVR Butterfly, ATmega169 microcontroller, and AVRISP mkII programmer  
Atmel Corp. | [www.atmel.com](http://www.atmel.com)

AVR GNU Compiler Collection  
Free Software Foundation, Inc. | [www.gnu.org](http://www.gnu.org)

### **William Wachsmann: Remote-Control Powered Trapdoor Lift**

#### **PROJECT FILES**

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#### **SOURCES**

ARM Cortex-M0+ processor  
ARM, Ltd. | [www.arm.com](http://www.arm.com)

FRDM-KL25Z Development platform and Kinetis L series microcontrollers  
Freescale Semiconductor, Inc. | [www.freescale.com](http://www.freescale.com)

TurboCAD program  
IMSI/Design, LLC | [www.turbocad.com](http://www.turbocad.com)

Tera Term terminal application  
LogMeTT.com | <http://logmett.com>

mbed IDE and SDK  
mbed | <http://mbed.org>

### **Jeff Bachiochi: Passive RFID Tagging (Part 1): Read-Only Tags**

#### **RESOURCES**

Priority 1 Design, [www.priority1design.com.au](http://www.priority1design.com.au)

B. Violino, “The History of RFID Technology,” *RFID Journal*, 2005,  
[www.rfidjournal.com/articles/view?1338](http://www.rfidjournal.com/articles/view?1338)

Wikipedia, "Tuned circuit animation3.gif,"  
[http://en.wikipedia.org/wiki/File:Tuned\\_circuit\\_animation\\_3.gif](http://en.wikipedia.org/wiki/File:Tuned_circuit_animation_3.gif)

#### SOURCES

EM4095 RFID Base station  
EM Microelectronic-Marin | [www.emmicroelectronic.com](http://www.emmicroelectronic.com)

PIC18F25K22 Microcontroller  
Microchip Technology, Inc. | [www.microchip.com](http://www.microchip.com)

SchmartBoard  
SchmartBoard | [www.schmartboard.com](http://www.schmartboard.com)

### Ayşe K. Coskun: Data Centers in the Smart Grid

#### REFERENCES

[1] PJM, "Market-Based Regulation," [www.pjm.com/markets-and-operations/ancillary-services/mkt-based-regulation.aspx](http://www.pjm.com/markets-and-operations/ancillary-services/mkt-based-regulation.aspx)

[2] H. Chen, C. Hankendi, M. C. Caramanis, and A. K. Coskun, "Dynamic Server Power Capping for Enabling Data Center Participation in Power Markets," Proceedings of the International Conference on Computer Aided Design (ICCAD), 2013

[3] H. Chen, M. Caramanis, and A. K. Coskun, "The Data Center as a Grid Load Stabilizer," Proceedings of the Asia and South Pacific Design Automation Conference (ASP-DAC), 2014

[4] C. Isci, S. McIntosh, J. Kephart, et al., "Agile, Efficient Virtualization Power Management with Low-Latency Server Power States," Proceedings of the 40th Annual International Symposium on Computer Architecture (ISCA), 2013

#### RESOURCE

A. K. Coskun, "Application-Aware Power Capping," *Circuit Cellar* 280, 2013

### Ed Nisley: Battery Capacity and Aging

#### RESOURCES

AA Portable Power Corp., "Li-ion 14430 Cylindrical Rechargeable Cell,"  
[www.batteryspace.com/li-ion-14430-cylindrical-rechargeable-cell-3-7v-650mah-4-5-aa-size-2-4wh-ul-un-approved-ndgr.aspx](http://www.batteryspace.com/li-ion-14430-cylindrical-rechargeable-cell-3-7v-650mah-4-5-aa-size-2-4wh-ul-un-approved-ndgr.aspx)

Blue Nook Corp., [www.bluenook.com](http://www.bluenook.com)

E. Nisley, "Battery Power: Feeding the Z3801A," *Circuit Cellar* 155, 2003

———, "Battery Capacity: Discharge," *Circuit Cellar* 199, 2007

———, "Battery Capacity: Charge," *Circuit Cellar* 201, 2007

———, "Real-World NiMH Charging," *Circuit Cellar* 221, 2008

———, "Parallel NiMH Cell Measurement," *Circuit Cellar* 247, 2011

———, Softsolder.com, "NB-5L Holder: Coil Springs," <http://softsolder.com/2011/09/21/nb-5l-holder-coil-springs>

———, Softsolder.com, "Canon NB-6LH Battery Test Fixture," <http://softsolder.com/2014/01/22/canon-nb-6lh-battery-test-fixture>

Wikipedia, "Peukert's law," [https://en.wikipedia.org/wiki/Peukert%27s\\_law](https://en.wikipedia.org/wiki/Peukert%27s_law)

#### **SOURCE**

CBA-II Computerized battery analyzer

West Mountain Radio | [www.westmountainradio.com](http://www.westmountainradio.com)

### **George Novacek: Wireless Data Links (Part 3): Receivers and Recovery**

#### **RESOURCES**

G. Novacek, "RF Design Review," *Circuit Cellar* 247, 2011

———, "The Super-Regenerative Receiver," *Circuit Cellar* 248, 2011

———, "Impedance Matching," *Circuit Cellar* 281, 2013

———, "Wireless Data Links (Part 2): Transmitters and Antennas," *Circuit Cellar* 284, 2014

#### **SOURCES**

CMMR-6P IC Receiver

C-MAX Time Solutions GmbH | [www.c-max-time.com](http://www.c-max-time.com)

MICRF218 Receiver and QwikRadio RF ICs

Micrel, Inc. | [www.micrel.com](http://www.micrel.com)

WRL-10532 Receiver

SparkFun Electronics | [www.sparkfun.com](http://www.sparkfun.com)