

# The Radio Club of America

1909



2012

## 2012 Technical Symposium Program

With the 103rd  
Anniversary Awards Banquet  
of The Radio Club of America.

New York Athletic Club  
New York, NY

Friday, Nov. 16, 2012  
9 a.m. to 3 p.m.



The  
technology  
legacy  
continues ...



# 2012

## PRESENTATIONS AND SCHEDULE

**Moderator:** John Facella

### Presentations and Schedule:

- 9 a.m. - 10:05 a.m.**      **“Hams With Class”** by Carole Perry;  
**“Radios in the Stratosphere: High-Altitude Ballooning”** by Erin King
- 10:15 a.m. - 12 p.m.**      **“TROPOSPHERIC DUCTING - 2,500 miles from Los Angeles to Hawaii every July!”** by Gordon West;  
**“Why LTE broadband systems will be a different experience for public safety users from LMR trunking systems”** by John Facella;  
**“Using RF to remotely disable IEDs”** by Felix Vega.
- 1 p.m. - 2:30 p.m.**      **“A propagation and capacity modeling tool for public safety LTE system design, and a short update on LTE technology”** by Robert A. Lopez;  
**“Marconi, Metamaterials, Microwaves, and Invisibility Cloaks”** by Nathan “Chip” Cohen.
- 2:30 p.m. - 3 p.m.**      **“Open Forum”** - a free-for-all discussion and Q&A session addressing any wireless technology topic with the moderator, presenters, and special guests.

**Shown on front cover:** Large photo, President Emeritus Fred M. Link (1904-1998) in the early days of radio. Inset photo far left, Andrew Seybold, *Fellow*, and Austin Schaller (right), presenter, at the 2011 Technical Symposium during the Annual Banquet festivities.



# Biographies of presenters:

## Nathan Cohen

Nathan Cohen is CEO of Fractal Antenna Systems. He holds a Ph.D. in astrophysics and retired as a professor from Boston University in 2002, after 30 years as teacher, radio astronomer, and applied scientist. In the last decade he has actively been an inventor, now with 28 U.S. patents. He is the pioneer inventor on fractal antenna, fractal filter, fractal metamaterial, and invisibility cloak technology.



Cohen is an RCA member and also holds callsign W1YW.

**Title:** “Marconi, Metamaterials, Microwaves, and Invisibility Cloaks”

**Synopsis:** Metamaterials have their start with Marconi in 1919. Their recent “re-discovery” promises new paths to optics and antennas (among others) and culminates with the much desired “invisibility cloak”. With some help from fractals, invisibility cloaks are now real, physically large, wideband, and easy to make at microwaves. Here Dr. Cohen will give the real story behind Harry Potter’s mythical wonder, and provide a live demonstration. Applications in RF may eventually be ubiquitous--what do you need to disappear?

## Moderator: John Facella

John Facella, P.E., C.Eng., is a Senior Vice President of RCC Consultants Inc. He was previously the Director for Public Safety Markets at Harris Corporation, Public Safety and Professional Communications (formerly Tyco Electronics M/A-COM). Facella has 25+ years of experience in public safety radio communications, a BSEE from Georgia Tech, an MBA from Georgia State University, is a registered professional engineer, and a chartered engineer (in the U.K.). He is a member of the Association of Public Safety Communications Officials (APCO), the International Association of Fire Chiefs (IAFC), is a vendor member of the IAFC Communications Commit-

tee and served on the ‘Digital Radio Problem Working Group,’ is a member of the National Fire Protection Association (NFPA) and is a member of the NFPA 1221 committee, and is a member of the International Association of Chiefs of Police



(IACP) Communications and Technology Committee. Facella is a life member and Fellow of the Radio Club of America. He is also an active firefighter/EMT with 25+ years of experience.

**Title:** “Why LTE broadband systems will be a different experience for public safety users from LMR trunking systems”

**Synopsis:** Why LTE broadband systems will be a different experience for public safety users from LMR trunking systems.

## Erin King

Erin King is from Columbus, Georgia, and is currently a freshman attending the Massachusetts Institute of Technology. She is studying electrical engineering and computer science. She was first licensed as a technician in her freshman year of high school, at the same time as her dad and some friends. She and her dad got their general and extra-class licenses in subsequent years. Since she got her license, Erin has used ham radio for several high-altitude balloon



## 2012 Biographies of presenters (cont.)

missions. After she got accepted into MIT, she launched a balloon honoring the university. The YouTube video of that balloon launch gained widespread recognition, which led to her invitation to speak in three events at the 2012 Dayton Hamvention as well as her nomination for and receipt of the 2012 Young Ham of the Year award. Erin enjoys attending hamfests, participating in Field Day and other occasional contests, and talking on local repeaters. She likes using PSK31 and is in the process of learning CW. She is in the MIT Radio Society and plans to continue to pursue new activities in the hobby.

**Title:** *"Radios in the Stratosphere: High-Altitude Ballooning"*

**Synopsis:** Ever wondered how to launch something over 80,000 feet into the atmosphere? From a weather balloon at high altitude, cameras can take beautiful photographs of the curve of the Earth and sensors can record scientific data. Learn how to build a payload, prepare for its launch, track its flight, and recover it.

### **Robert A. Lopez**

Robert A. Lopez, P.E., is Vice President and General Manager at RCC Consultants, Inc. He joined RCC in 1989 after beginning his career in public safety / mission critical land mobile radio with Motorola C&E, Inc. in 1985. There he started as an engineering intern while completing his BSEE degree at the New Jersey Institute of Technology (NJIT) in 1986 and his MSEM in 1995. He is a mem-



ber of RCA, IEEE, APCO, NFPA, Project Management Institute (PMI) and the National Society of Professional Engineers (NSPE) and holds a Level 2 certification in iBwave distributed antenna system (DAS) systems design. At RCC, Lopez leads a group specializing in the development of tools and processes for the planning,

design and analysis of narrow band and broadband radio systems including P25, TETRA, DMR, LTE, fixed wireless point-to-point and multipoint networks addressing issues of radio coverage, delivered audio quality (DAQ), reliability, capacity, intermodulation, interference and non-ionizing radiation as dictated by FCC, TIA, ITU and 3GPP guidelines.

**Title:** *"A propagation and capacity modeling tool for public safety LTE system design, and a short update on LTE technology"*

**Synopsis:** A propagation and capacity modeling tool for public safety LTE system design, and a short update on LTE technology.

### **Carole J. Perry, WB2MGP, Fellow and director of RCA**

Carole J. Perry, WB2MGP, is a Fellow and a Director of RCA. She is currently Chair of RCA's Youth Activities Committee.

Perry created the RCA Young Achievers Award, which is awarded to students in grades 12 or below who have demonstrated technical expertise and creativity in wireless communications. At RCA's Centennial Awards Banquet in 2009, Perry was presented with RCA's President's Award. In 1996, RCA awarded her its "Barry Goldwater Award." The Quarter Century Wireless Association presented its "President's Award" to Perry in 1993. In 1991, she was the recipient of the "Marconi Memorial Award" given by the Veteran Wireless Operator's Association. In 1987, Perry received the prestigious Dayton Hamvention "Ham of the Year" award and the American Radio Relay League "Instructor of the Year" award. After a 16-year career as executive vice president for RapidCircuit Inc., an electronics manufacturing



## 2012 Biographies of presenters (cont.)

company, Perry, in 1981, joined the staff of Intermediate School 72 in Staten Island, NY, where she created the curriculum for "Introduction to Amateur Radio," which she taught until her retirement in 2004. Perry currently serves as a columnist for WorldRadio magazine, and has moderated the "Youth Forum" and "Instructor's Forum" at the Dayton Hamvention for the past 25 years.

**Title:** "Hams With Class"

**Synopsis:** The Ham radio ripple effect will be discussed. A young person becomes a ham radio operator, accomplishes creative things, and then gets invited to be a presenter at the Dayton Youth Forum. From there the RCA Young Achiever is invited to give a presentation at the RCA Technical Symposium where they are invited to network with our members.

### Felix Vega

Felix Vega received the B.S and M.Sc. degrees in electronics engineering from District University of Bogota, Colombia, in 1998 and 2003, respectively, and the Ph.D. degree in electrical engineering (Summa Cum Laude) from the National University of Colombia, Colombia, in 2011. He is currently working toward a second Ph.D. degree in electrical engineering at the Swiss Federal Institute of Technology of Lausanne (EPFL), Switzerland. He is currently an Assistant Professor at the National University of Colombia. He collaborates with Montena Technology in Switzerland in the development of Nuclear Electromagnetic Pulse (NEMP) testing systems. His research interests include generation and radiation of fast rise-time high power electromagnetic signals, intentional electromagnetic interference, microwaves and pulsed power.



**Title:** "Using RF to remotely disable IEDs"

**Synopsis:** We present the results of a research project on the use of high power electromagnetic systems to deactivation of Improvised Explosive Devices found in Colombia. In the first part of the talk we discuss characterization of the IEDs from the electromagnetic and electro-thermal points of view and the coupling of electromagnetic waves to the wiring system of the IED as a function of the frequency. The second part of the talk presents some results on the RF sources and the experimental tests developed on the project.

### Gordon West

Gordon West, WB6NOA, teaches ham radio classes throughout the country, is an RCA Fellow, and



goes back to the early days of marine radio in the '50s, assisting in installing Amplitude Modulation 2-3 MHz marine radios, and working up capacitive antenna systems that made the Webster whips a signal to be heard! West writes books, presents weekly HAM NATION pod casts, and makes ham radio a priority in all he does! West is a life member of the American Radio Relay League, and strongly promotes both ARRL and RCA membership in all of his classes.

**Title:** "TROPOSPHERIC DUCTING - 2,500 miles from Los Angeles to Hawaii every July!"

**Synopsis:** Each year, a Pacific stationary high pressure system stalls between Hawaii and the West Coast, triggering days of VHF/UHF radio excitement. Ham operators love it, but local West Coast high-band fire departments, still on analog, end up with 2500 miles away dispatches in error! See a laser demo of how the tropo path forms up, and hear actual world breaking ham calls on frequencies up to 5,000 MHz!

# 2012

## NOTES & ACKNOWLEDGEMENTS

**Thanks to all of the people that helped produce this event, and particularly:**

- The moderator and each of the presenters.
- V.G. Duvall, Fellow & a Director, and Tom Thornton, Fellow – for onsite logistical support (furniture, equipment, lighting, greeting guests, logging attendance, snacks, etc.).
- Bruce McIntyre, Fellow & Executive Vice President, and Andy Seybold, Fellow & a Director – for special assistance (as needed).
- Karen Clark, Fellow & Executive Secretary – for administrative support (guest registrations, document preparation, promotional mailings, promotional webpage preparation, etc.).
- Diane Weidenbenner and Mercy Contreras, Fellow & President Emeritus - for editing, preparing and printing the formal color program document.
- John Facella, Fellow & a Director – for providing the main laptop PC (loaded with the presentations), assistance procuring presenters, and helping line up the program.
- Rob Lopez and RCC Consultants - for providing the video projector and screen.
- Paul Gilbert – for photographic services, providing the backup laptop PC (loaded with the presentations), and assistance with onsite logistical matters.
- Dave Bart, Fellow & a Director, Sandra Black, Fellow & Vice President, Carole Perry, Fellow & a Director, June Poppele, Fellow & a member of the Executive Committee, and Stan Reubenstein, President Emeritus – for assistance procuring presenters and other volunteer workers.
- Tim Duffy, Fellow & a Director – for handling room booking and A/V ordering, for assistance procuring presenters, and for general management of the awards banquet and all related activities.
- Rich Reichler, Fellow & a former Director - for coordinating/producing this event.

**We also express our gratitude for the audio/video recording.** Audio/video recording. Each year from 2002 through 2008, AC Video Services (“ACVS”) (Andy Conte, Fellow) [<http://www.takeonenetwork.com/acvideo/>] [(800) 710-8804 and (973) 661-1976] made an audio/video recording of this event since this provides a nice historical record and enlarges the audience. These yearly recordings are available for purchase (currently in the form of DVDs) from ACVS.

**The PowerPoint presentations and/or papers** presented at this event might also be published by the RCA and be available via its Internet website, its journal (The Proceedings of the Radio Club of America), etc.

**Continuing Professional Education Credits** might be available for people attending this event.

### **Opportunities and request for future help.**

Please contact Rich Reichler (RJRWireles@aol.com) to provide information about any possible sponsors, speakers, helpers, or ideas for a future RCA Technical Symposium.

In support of its charitable, educational, and scientific missions, RCA has set up this event. The RCA welcomes contributions of financial and human resources to help its education/scholarship funds and other programs.

For the radio/wireless industry, RCA (established 1909) brings people together, provides educational materials, grants scholarships, supports radio/technology classes, promotes scientific advancement, preserves history, and recognizes excellence. People wanting to join RCA, contribute to its education/scholarship funds, etc., may contact RCA: (303) 948-4921, [www.RadioClubofAmerica.org](http://www.RadioClubofAmerica.org), [Info@RadioClubofAmerica.org](mailto:Info@RadioClubofAmerica.org)

# 2006-2011

## PAST SYMPOSIUM TOPICS

### Highlights of recent past RCA Technical Symposiums:

These events showcase the diverse technologies and many talented individuals that exist in the radio industry. Here are some of the topics and presenters that have been part of recent RCA Technical Symposiums.

#### 2011

- “Hams with Class,” presented by Carole Perry
- “Fractal Antennas,” presented by Austin Schaller
- “In-building and DAS Communications Review,” presented by Jack Daniel
- “P-25, Some Clarification,” presented by Paul . Gilbert
- “Deploying Public Safety Broadband LTE in Texas,” presented by Cynthia Wenzel Cole
- “Inflatable Satellite Communication Systems,” presented by Paul Gierow

#### 2010

- “Current state of 700 MHz Broadband for Public Safety,” presented by John Facella
- “Can Broadband Replace Channelized Wireless?” presented by Andrew M. Seybold
- “AWA & RCA: Preserving The Past & Creating A Vision For The Future,” presented by David Bart

#### 2009

- “NASA – JPL Spacecraft Explorer I; 50 Years later Cassini,” by Henry L. Richter
- “100 Years of Radio Development,” by Bruce Roloson and Felicia Kreuzer
- “Innovations in Amateur Radio,” by Carole J. Perry
- “The Rebirth of LMR,” (about NXDN, etc.) by Peter Moncure
- “What’s New in Transmission Technology,” by Dennis Martinez
- “Trends in IP Convergence: IP Technology for Mission Critical Networks, and Mesh Technology Primer,” by John Facella
- “Public Safety Broadband, Compelling Applications,” by Michael W. Hunter

#### 2008:

- “See How Antenna’s Work,” presented by Dale P. Clement
- “Future Evolution of Cellular Telecommunications,” presented by Kenneth C. Budka
- “Wireless Telecommunications Requirements of Critical Infrastructure Providers,” presented by Mark Madden and M. Kelly McNair

#### 2007:

- Presentation by Dana Dulabone about advanced wireless technologies for personal communication systems
- Presentation by John Chapin about software defined radio

#### 2006:

- Presentation by Hugo Gaggioni about high definition television (“HDTV”) broadcast technology
- Presentation by Leonard R. Kahn about the state of the art of new AM broadcast technology

# Get Radio Club of America Invited

## Good things are meant to be shared!

Have you enjoyed the Technical Symposium today?

If so, why not jot down three friends' names that you'll invite to join the Radio Club of America awards banquet and symposium next year?

The Radio Club of America's membership has grown over the years by word-of-mouth. Invite your colleagues to join the Club in 2012-2013.

Then, invite them to next year's banquet.

## Enjoy the dinner and awards banquet!



**Radio Club of America**

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