

From flying tubes and pole-climbing robots to running packet radio on smartphones, a new generation of young hams is front-and-center in the ongoing effort to integrate new technology and amateur radio. Five of them have been showcased at the Radio Club of America's annual Technical Symposium.

Charting the Future of Ham Radio

Young Achievers at the Radio Club of America's Technical Symposia

BY CAROLE PERRY*, WB2MGP

In 2009, the Radio Club of America turned 100 years old; making it the world's oldest active wireless society. In 2007, when I became chairperson of the RCA Youth Activities program, I vowed to initiate more activities that would encourage more young people to join. One of the most successful of these initiatives has been inviting technically talented and creative youngsters to give presentations at the annual RCA Technical Symposium, which is held in conjunction with the club's annual awards banquet. This prestigious event has played host to many notables in wireless technology through the years, such as Marty Cooper of cell phone technology fame, and Dr. Nathan Cohen, inventor of the fractal antenna.

In 2011, I invited one of my RCA Young Achievers who had been a presenter at my Dayton Youth Forum to give a pre-

sentation at the RCA Technical Symposium in Dallas, Texas. The talk was so successful that a youth presentation has now become a regular feature at the symposium. Here is a look at each of the RCA Young Achievers presenters to date, along with their projects.

2011: Austin Schaller, KDØFAA

Austin Schaller, KDØFAA, then 17 years old, from Boulder, Colorado, was the first young adult invited to be a presenter at the symposium. He kept the audience spellbound with his talk on his research into the work of Dr. Cohen, W1YW, a Boston radio astronomer who invented the concept of the fractal antenna in 1988. The unique structure of a fractal antenna allows it to maximize its perimeter length and significantly reduce its overall size. Austin, *Photo A*, explained that these antennas are also multi-band and wide-band and can operate on multiple bands simultaneously. Austin set the bar very high for future young presenters.

Austin is presently attending LeTourneau University in Longview, Texas, with the goal of graduating with a bachelors/masters of science in electrical engineering (EE) as well as a computer minor and math minor. We are all so proud of him and wish him well.

2012: Erin King, AK4JG

In 2012, 17-year-old Erin King, AK4JG, *Photo B*, was one of my outstanding presenters at the Dayton Youth Forum. I was delighted to invite her to the RCA Technical Symposium in November of that year. After Austin's incredible presentation the year before, I had been challenged by fellow club members to top or equal what he had done with another RCA Young Achiever. The only way to do that was to find a technically talented and creative *female*. Erin's topic was about her project of sending her Massachusetts Institute of Technology (MIT) acceptance letter to the edge of space. MIT has a tradition of sending incoming freshmen their acceptance letters in silver mailing tubes. The students have a tradition of conducting creative experiments with these tubes.

During her RCA presentation, Erin showed a YouTube video of her rigging the tube to a small weather balloon, along with two GPS-equipped radios, a camera, a helium tank, and

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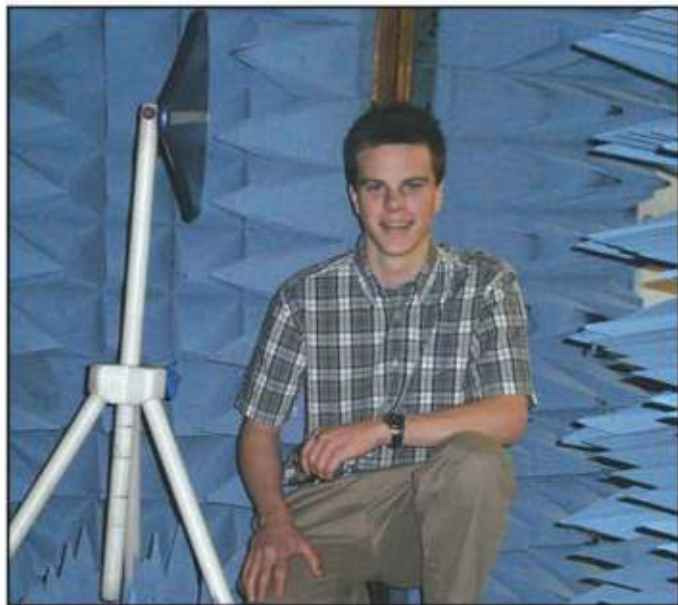


Photo A. Radio Club of America 2011 Young Achiever Austin Schaller, KDØFAA, surrounded by fractals on a visit to a fractal antenna facility. (Photo courtesy KDØFAA)

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Photo B. Author Carole Perry, WB2MGP, presents the 2012 RCA Young Achiever award to Erin King, AK4JG.

Erin stays in touch and is presently studying a mix of computer science and mechanical engineering at MIT, where she is a junior, with a focus on robotics. For the past two summers, she has been an intern at Google in Mountain View, California. She plans to apply to graduate school and then work in a field that combines her software experience with her passion for robotics, prototyping, and working directly with hardware.

2013: Chris Blackwood, KD2CXC, and Devlin Murray, KC2PIX

Well, how do you top having an exceptional young man, and then an exceptional young lady as a presenter? You have an exceptional team of a boy *and* a girl the next year. In 2013, I invited Chris Blackwood, KD2CXC, then a junior in high school, and Devlin Murray, KC2PIX, then a freshman at New Jersey Institute of Technology, to give a presentation based on their Dayton Youth Forum demonstration of a pole-climbing robot they created (Photo C). In November 2013, they brought their robotic device to the RCA Technical Symposium in Orlando, Florida, where they stopped the show; just as they had done in May at Dayton.

They are both members of a robotics club that designed and built a robot capable of climbing light poles. Attached to the robot is a radio antenna. The idea is that the device can be used to restore emergency communications quickly in the aftermath of a natural disaster that has decimated traditional communications systems. Their theory is that light poles are generally in ample supply, and that even the most horrific storm won't knock them all down. The show literally came to a halt as a break was called for the eager audience members to come up and inspect the device up close. They were a huge hit!

a parachute. The balloon was released in Lumpkin, Georgia; and it rose to 91,000 feet (35.27 miles) before bursting. The silver tube with the acceptance letter drifted to earth. Members of the local amateur radio club chased the tube 100 miles across South Georgia. APRS (Automatic Packet Reporting System) was the primary tracking system that led to finding the tube 75 miles from where it was launched.



Photo C. Chris Blackwood, KD2CXC (kneeling), and Devlin Murray, KC2PIX, demonstrate their pole-climbing robot for temporary antenna installations at the Dayton Youth Forum in 2013.

Chris is now a senior in high school where he tells me about a “cool class” he’s in called “Advancements in Engineering.” He’s working on a project with a portable cell phone charger that runs on 2 AA alkaline batteries. He’s also really enjoying working with the 3-D printer. He’s applying to colleges and is hoping to get into MIT or Princeton, and to study electrical engineering and computer science.

Devlin, who is currently a junior at NJIT, is studying EE and was one of the demonstrators of the pole-climbing robot at the ARRL Centennial Youth Forum in July 2014. She explained how she and Chris and the rest of their team designed, engineered, and built the device in 100 days, using off-the-shelf parts for about \$300. I just know we will be hearing more about these two talented young people in the future.

2014: Rohan Agrawal, KJ6LXV

In November 2014, I invited 13-year-old Rohan Agrawal, KJ6LXV (Photo D), to be the young presenter at the RCA Technical Symposium in New York City. Rohan has been licensed since age nine, and has been very actively involved in ham radio activities; including his city’s (Cupertino, CA) emergency response team. He is also very active in

several ham radio clubs. Rohan has been a presenter at my Youth Forums at Pacificon in both 2013 and 2014. He is also a robotics enthusiast and an entrepreneur at heart. In his free time, he works with a few start-ups in Silicon Valley, and participates in various non-profit organizations for kids. (And yes, you read it right; he’s 13!)

Photo D. Rohan Agrawal, KJ6LXV (right), with fellow young ham Scott Elias, KDØWBB, at the 2014 RCA Dayton youth booth (along with an unidentified adult ham pretending to be the Statue of Liberty).



At the symposium, Rohan gave a presentation about “Ham Radio and Smart Phone Technologies.” He explained that in ham radio, we generally don’t use the prettiest or cleanest user interfaces. In the age of smart phones, Rohan says, “there should be no reason for this.” Everyone is walking around with a powerful computer that is simple and elegant to use, right in their pockets. Nowhere is this more prevalent than in packet radio. Designed to be a quick and easy way to exchange text over ham radio, packet is clunky and difficult to use, making it hard to use in a texting-like fashion. “What I have done with my software,” says Rohan, “is bridge the gap between the smartphone world and the ham radio world, using Bluetooth Low Energy. This allows for a simple, beautiful, interface for packet radio.” The audience was so impressed with Rohan that he was given one of the awards for the best presentation.

2015: ??

All five of these Young Achievers are representative of the kind of young people we should all be encouraging and supporting. I point to them proudly and think that if we’re really lucky *they* can be the future of ham radio and technology. Please be sure to recommend to me any young hams you encounter who meet the criteria for technical excellence and creativity so we may continue to honor and showcase these most precious natural resources in our country. And if Dayton is in your plans for this month, be sure to stop in at my Youth Forum for a preview of this year’s possible RCA Young Achiever presenter.