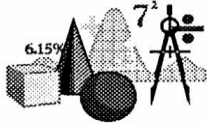




SPARKS

Daytona Section Newsletter
November 2014



NOVEMBER/DECEMBER SECTION MEETING

Thursday December 4th at the Halifax River Yacht Club, 6:00 PM
331 South Beach Street, Daytona Beach, Florida 32114

PRESENTATION TOPIC – ROCKIN’ ROCKETS WITH RF

CHAIRMAN’S REPORT

Our October meeting was not well attended. There were some excuses like the ERAU students had a big event they had to attend like a lab or project, etc. I think it was the speaker. Nobody (or not many), wanted to hear yours truly drone on about global climate change. In any event I want to thank those who did come.

Our next meeting is the last of the year and, happily, will be the last with me as chairman. I hope you all can come and vote in a new slate of officers. The talk sounds very interesting. People don't realize it but the exhaust of a rocket engine is so hot that at least the outer electrons are loose. That is they are not linked to any particular nucleus. In my book that's a plasma and plasmas conduct just like a metal.

This is my last report after two years as chairman. I've been chairman before. I can't remember when or how long, but this turn has been special. Filling the top chair in any organization is easy if you have good people supporting you. And I had some great ones. The whole Excom is great but I want to give special thanks to Roger for not just getting publicity but seeing all the problems in an issue and getting them out in the open. I thank Ron for an outstanding job arranging tours and events for the life members (which were attended by some younger members too) and always sharing profound insights like "what is the museum thinking". Charlie is a gem. Not only is he a great treasurer and not only does he manage the telescope but he is a phenomenal web master. As Florida Council Secretary I must visit other section web sites and ours compares very favorably with the largest sections - those with 10 times our membership. Al is another gem. As secretary and Sparks editor he is another who keeps things from falling through the cracks. He is always on my back to get my articles in and never gets mad or unpleasant. Finally I can't say enough good things about Jeanette. Not only is she an outstanding manager but she is in touch with the next generation and what is going on. Old people sit around and moan about what is happening to the world. Well let me assure you it is very good hands. The young people in our student chapters and the applicants to MIT that I interview leave me with confidence in the next generation and Jeanette is their spokesperson.

So I thank you for having me as chairman but I am not going away. I may be 85 but I have no plans to die soon. I hope Jeanette will find something useful for me to do. You will find me at the bar.

Tracy

OUR OCTOBER PRESENTATION

Tracy Wichmann doing his presentation titled "Global Warming – From the Beginning" at our October 23rd Section meeting.



NOVEMBER PROGRAM

ROCKIN' ROCKETS WITH RF

Charged rocket plumes generally exceed the length of their source vehicles, and offer lightning a favorable path to ground. Rocket plumes enhance the induced transient currents in flight electronics, and increase the risk of vehicle failure. The affinity of lightning to the plume can be associated with the plume's electrical properties, which are coupled to plasma characteristics including the electron number density. However, the electron number density of rocket plumes is not well-known. In this study, the electron number density is characterized through data from static rocket firings. A model of the plume in finite difference time domain (FDTD) simulations also supports the results. Radio frequency and radar methodologies are used to characterize the plume as a dynamic component of an electrical system, supported by the construction of an RF apparatus that includes the design and manufacture of ultra-wideband antenna arrays. The research estimates electron number density, but the data suggests other dynamic elements affect delay and attenuation of the radio signal.

OUR SPEAKER

Jorge Torres is a student enrolled in Embry-Riddle Aeronautical University's (ERAU) Master of Science in Electrical and Computer Engineering program. He received his Bachelor of Science in Electrical Engineering from the same university in 2012. He currently works as a teaching assistant for the ERAU Electrical, Computer, Software, and Systems Engineering Department's capstone design course. Jorge's Master's thesis is titled, "Characterization of Electron Number Density in Rocket Exhaust Plumes through Microwave Transmissions," which involves extensive work with RF equipment, signal processing, plasma physics, and high power

rocketry. He has been a five-time intern for the space launch company, United Launch Alliance, participating in avionics, software, systems, manufacturing, and launch operations groups. Jorge also holds a National Association of Rocketry Level 2 High Power Rocket Certification. In his practically nonexistent spare time, Jorge enjoys going to thrift stores with his fiancée to find old things to fix.

DAYTONA SECTION NEWS

CONGRATULATIONS ARE IN ORDER!

We are proud to announce that Jeanette Barott and Dr. William Barott made senior member at the IEEE's October panel meeting for senior membership promotion. Congratulations to both on a well deserved promotion.

We encourage members to make application for nomination to become senior members. Our section can help obtain application forms and connect you with senior or fellow members for endorsements.

OFFICER NOMINATIONS FOR 2015

Election of officers for 2015 will take place at our December 4th meeting. The following candidates have been nominated for the elected positions:

Chair – Jeanette Barott
Vice Chair – Dr.Keith Garfield
Treasurer – Charlie Husbands
Secretary – Roger Grubic

The Section will recognize nominations from the floor. The election will be held after all nominations have been presented. All Section members are encouraged to attend and volunteers for elected or non-elected positions are welcome.

IEEE HOLIDAY HORROR TALES

On Friday December 5, ERAU and our Section will be hosting presentations of IEEE Holiday Horror Tales, with free Pizza, and stories from industry of the most gruesome, and amazing, engineering recoveries of our members' career. It will be held at Embry Riddle in Lehman Building 335, from 4 o'clock to 7 o'clock PM. Each member is invited to prepare approximately five minutes worth of material to present. If you are planning on presenting "something", please e-mail barottj@erau.edu so that she can plan the schedule accordingly!

EMBRY-RIDDLE NEWS

Friday, December 5, in Lehman Building 335, from 4 o'clock to 7 o'clock PM we will be hosting the IEEE Holiday Horror Tales, with free Pizza, and stories from industry of the most gruesome, and amazing, engineering recoveries of our members' career. Each member is invited to prepare approximately five minutes worth of material to present. If you are planning on presenting "something", please e-mail barottj@erau.edu so that she can plan the schedule accordingly!

ERAU's IEEE Xtreme 24 HOUR PROGRAMMING COMPETITION

Dr. William Barott reports that the results have been posted for IEEE Xtreme, the 24 hour programming competition in which 12 ERAU students participated over fall break. They competed against roughly 1800 teams worldwide. Our top two teams (ERAUPenguin, ERAUHippo) placed first and second among teams from Florida, and #16 and #20 of the 74 teams from the southeast region. ERAUPenguin was in the top 18% of teams worldwide.

Billy would like to thank the faculty proctors who made this event work. In addition to Billy and Jeanette, the proctors included Dr. Keith Garfield (graveyard shift!), Dr. Richard Stansbury, Dr. Jianhua Liu, Dr. Radu Babiceanu, Dr. Thomas Yang, and Dr. Shuo Pang. Also, IEEE students Ryan Gauthier and Chris Mimms did much of the organizing and wrangling for this event.

Photo of the chipper students prior to 24 hours of solid programming



From left to right, they are: 1. Andrew Strange, 2. Thomas Bassa, 3. Paul Mundy, 4. Alex Spradlin, 5. Sean Holden, 6. Alejandro Baza, 7. Julian Avila, 8. Aaron Kersch, 9. Matthew Alpert, 10. Alex Procaccini, 11. Francisco Arios, 12. Pedro Silhy

The team placements were:

ERAUPenguin: #1 in FL, #16 in Southeast, #43 in the country, #316 worldwide

ERAUTeamHippo: #2 in FL, #20 in Southeast, #55 in the country, #396 worldwide

ERAUPrime: #6 in FL, #44 in Southeast, #145 in the country, #1024 worldwide

SuperDuperERAUCoders: #10 in FL, #65 in Region, #203 in the country, #1498 worldwide

There were about 12 teams from Florida, 74 teams in the southeast, 231 in the country, and 1800 teams worldwide. Penguin's placement is similar to the placement of our top scoring team from last year.

For those who are interest, a full scoring is available here:

http://www.ieee.org/membership_services/membership/students/competitions/xtreme/index.html

A list of the participants and their programs is below. With apologies, Billy doesn't have the association of which of the second pair is ERAUPrime and which is SuperDuperERAUCoders.

ERAUPenguin:

- Aaron Kersch, MSE, Fall 2015
- Paul Mundy, BSEE, Spring 2018
- Thomas Bassa, BS/MSE, Spring 2016

ERAUTeamHippo:

- Alexandria Spradlin, BS/MSE, Spring 2016
- Sean Holden, BSCS, Spring 2016
- Andrew Strange, BSEE, Spring 2018

(Unknown)

- Alejandro Baza, BSSE, Spring 2017
- Julian Avila, BSSE, Spring 2016
- Matthew Alpert, BSCS, Spring 2016

(Unknown)

- Alexander Procaccini, BSSE, Spring 2017
- Francisco Arios, BSHF, Spring 2017
- Pedro Silhy, BSAE, Spring 2017

ANOTHER TALE FROM THE OLD PROFESSOR

FREED, EISEMAN and SKILLDUGGERY

A few months ago I made my yearly trip with a friend, John, to a Hamfest, which is a ham radio swap fest. I cautioned John, "Please don't tell me about any antique radios you see. I am trying to return home without a new antique."

The weather was great. I got a supply of RF connectors, some transmission line and other items at bargain prices. I looked at but walked away from every antique radio I saw even though some were attractive.



John and I met at the designated point and time and prepared to leave. "There is a 1923 Freed-Eisemann radio for sale right by the door. We will pass it as we leave"; he said. "I know. But you weren't supposed to tell me" I scolded. The radio included two spare tubes and a pair of headphones and was in excellent condition. But there was one big problem; the radio had no cabinet. The price was \$300 which would have been reasonable if there was a cabinet and a bargain if it played and the spare tubes and headphones were included. But I looked it over as were about to leave. "You interested?" the seller asked. "Nah, too expensive" figuring that would satisfy him and spare me the story of how I have too many antique radios. "Well make an offer" he countered. "Fifty bucks" I replied. "Sold!"

John chuckled as we carried the radio, spare tubes and headphones to his truck for the trip home. But the headphones, which were in good shape with the original cord and plug were worth \$50 if they worked. The spare tubes were worth at least \$30 each if they were good. And the radio? I would have to build a cabinet which wouldn't be hard as the original was very simple. The radio wouldn't be worth as much as it would with the original cabinet. But if the radio worked then the value would be close to the \$300 asking price in spite of a new cabinet.

When I returned home I checked the headphones; good! I checked the spare tubes; good! At least I got my fifty bucks worth. I started to check the radio by applying filament voltage. Radios of this vintage operated from batteries and the "A" battery was a 6 volt automobile battery. There was no filament current. I pulled out a tube to check if it was getting 6 volts. It was. Then I checked the continuity of the filament; open. Check another tube; open. All 5 tubes had open filaments. Obviously someone had put the wrong filament voltage on the radio and destroyed all 5 tubes.

That changed things. The Old Professor likes for all of his antique radios to play and he wasn't about to invest in material and labor for a new cabinet and three replacement tubes before it can be determined if the radio can be made to play at all.

But the Old Professor usually has a card or two up his sleeve. He took one of the vacuum tubes and put it in very hot water. This loosened up the glue that held the Bakelite base on the tube. Then he used a solder sucker and removed the solder from the tube pins. This allowed the base to be removed from the glass bulb. Then he inserted a field effect transistor and some other components so the circuit would have the same characteristics as the 90 year old vacuum tube minus the filament, of course.

He did this to all the vacuum tubes in the radio and tested the radio with its new "tubes". This radio is a "tuned radio frequency", TRF design which predated the use of the superheterodyne. TRF's suffer from feedback which the old Freed-Eisemann did with a vengeance because the new solid state tubes were "hotter" than the old vacuum tubes. The radio howled and squealed just like all old TRF's did but it was really bad. A few modifications to the circuits in the old tube bases and the radio played like the day it was brand new. Then the Old Professor glued the glass bulbs back on the tube bases to hide his skulduggery. Then he made an exact replica of the original cabinet and the 1923 radio looked and played like the day it left the factory.

I told John I got the old radio playing and made a new cabinet. "I gotta see it" and the next time he stopped by my house I showed and demonstrated the refurbished Freed-Eisemann. "Wow. That's amazing that it still works after all those years!" he said. Then he noticed the battery

sitting next to the radio. "Didn't these radios require A, B, and C batteries" John asked, "I only see one small 12 volt battery. And, I think I heard that radio play immediately after throwing the switch. Those old filaments didn't warm up that fast".

He was getting suspicious. I opened the top to the radio so he could see the insides; five shiny, silvery 90 year old vacuum tubes were staring back at him. There wasn't a hint of modern electronics.

The purpose of John's visit was to lunch at the DeLand Airport restaurant and as we were leaving John asked "What would it cost me to learn how you did that?" I replied, "A lunch".

Al Helfrich, Ph.D



DAYTONA SECTION SHIRTS

We are pleased to offer Daytona Section polo shirts for our Section members. The shirts are embroidered with the IEEE Logo and DAYTONA SECTION on the left and your name and grade, if desired, on the right. The shirt is a high quality 5 oz, 65/35 poly/cotton pique in Royal Blue with white embroidery. Available in S - 2XL in men's as well as ladies sizes. Price is \$27, including tax, for S-XL size's, 2XL size is \$3 additional.

For more information or to order shirts contact:

Allan Jusko
3706 Longford Circle
Ormond Beach, FL 32174
386-671-3706 or a.jusko@ieee.org

Indicate shirt size and name and grade if desired. Shirts must be paid for before ordering, typical turn around time is 2 weeks. Arrangements can be made to pick up shirts or have them shipped to you.



DAYTONA SECTION COFFEE MUGS

The Daytona Section has available coffee mugs with the IEEE Daytona Section Logo and are available for \$7.00. Purchase one or more to show you support and pride in our Section.

Contact Roger Grubic at 386-441-8958 or roger_grubic@ieee.org for more information.

EDITORS NOTES

The **SPARKS** newsletter is also available on our website <http://www.ieee.org/go/daytona>

Region 3 website

<http://www.ewh.ieee.org/reg/3/>

Melbourne Section website

www.ieeemelbourne.org

Orlando Section website

www.ieee.org/orlando

FUTURE MEETING DATES:

The meeting dates for the 2015 spring session are: Jan 22nd, Feb 26th, Mar 26th, and Apr 23rd

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NOVEMBER/DECEMBER 2014 MEETING

Thursday December 4th at the Halifax River Yacht Club
331 South Beach Street, Daytona Beach, Florida 32114
Just south of the Fire Station at the corner of Beach and Orange

AGENDA

5:30 PM Cocktails
6:00 PM Dinner
7:00 PM Program

TOPIC – ROCKIN' ROCKETS WITH RF

SPEAKER- Jorge Torres, ERAU

December 4th Dinner Menu

Honey Glazed Ham with whipped potatoes and roasted root vegetables (turnips, squash, beets)

Chicken Marsala with whipped potatoes and roasted root vegetables

Poached Salmon with a citrus dill sauce, rice and roasted root vegetables

All entrees served with rolls and butter, house salad, coffee and tea

Unless noted, dinner entrées are \$20.00 each. Students \$10.00 each

A Veggie plate is available on request for \$10

Please contact Allan Jusko with your dinner selections or for program information.

Selection's must be in by Wednesday the 3rd at noon so the club has time to order and prepare

Allan Jusko Secretary/Editor 386-671-3706 a.jusko@ieee.org

If you make reservations and are unable to attend, call at least 12 hrs prior to the event to cancel.

The Section is charged for all dinners ordered, please let us know if your plans change
