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The Institute of Electrical and Electronics Engineers, Inc.

Florida West Coast Section (FWCS)

Please Check the Website
Often for **UPCOMING EVENTS**
(Front Page Right Column)

<https://r3.ieee.org/fwc/>

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Next ExCom Meeting
Tuesday, February 7, 2023
Google Meet

Register with vTools

<https://events.vtools.ieee.org/m/342907>

PE Corner

Art Nordlinger, PE, Life Senior Member

New FBPE Board Members Announced

Last December Governor DeSantis announced the appointment of Christopher Dawson, James Gonzalez, and Sam Mousa, PE, and the reappointment of Yassi Myers, PE to the Florida Board of Professional Engineers. The Board now has a full compliment of members, which has not been the case for several years.

Mr. Dawson, a public member, holds the seat previously filled by Elizabeth Ferguson. His appointment term is from 10/31/2022 through 10/31/2026. He is a Shareholder at Gray Robinson, P.A. Mr. Dawson earned his bachelor's degree and master's degree in civil engineering from the University of Florida and his juris doctor from the University of Alabama.

Mr. Gonzalez, also a public member of FBPE, holds the seat previously filled by Vivian Boza. His appointment term is from 10/31/2022 through 10/31/2023. Mr. Gonzalez earned his bachelor's degree in finance from the University of South Florida and his master's degree and juris doctor from Villanova University.

Mr. Mousa is a civil engineer and will fill the seat previously held by Kevin Fleming, PE. His appointment term is from 10/31/2022 through 10/31/2026. He is the President of Mousa Consulting Group and Partner of Conventus, LLC. Mr. Mousa earned his bachelor's degree in civil engineering from the University of Florida.

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SP/COMM Signal Processing / Communications Joint Chapter:
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Ms. Myers, a current board member, has been re-appointed for a four-year term that ends on 10/31/2026. She is the President and Owner of TLP Engineering Consultants, Inc. Ms. Myers earned her bachelor's degree in civil engineering from Louisiana State University.

On a related note, the Florida Engineers Management Corporation (FEMC) Board, on which I currently serve, has an opening for a public (non-engineer) member. Though this column is primarily read by engineers, who aren't eligible to serve in this capacity, if you know someone who is interested in serving they can contact the Board office for an application.

One of the current engineer Board members will reach the end of their term on October 31, 2023. The FBPE Board, who appoints FEMC Board members, will likely discuss a replacement at either their August or October meeting. If you, or an engineer you know, is interested in serving on the FEMC Board, contact the Board office for an application.

If you or someone you know is interested in applying and has questions about serving on the FEMC Board, you can contact me or the Board office.

Whether you are a PE looking to attain required CEHs, or an engineer looking to learn something new or keep current with the latest trend in the profession, IEEE has seminars that will meet your needs. And for the PEs, don't forget that the next renewal is only 1 month away. Better start earning those CEHs now!

THE SUNCOAST SIGNAL, published monthly by the Florida West Coast Section (FWCS) of the Institute of Electrical and Electronics Engineers, Inc. (IEEE). **Please Note that the SUNCOAST SIGNAL is sent each month to ACTIVE members of the IEEE Florida West Coast Section. So to continue receiving the SIGNAL please keep your membership Active, meaning, renew your membership when it becomes due.** Annual subscription is included in the IEEE membership dues. The opinions expressed, as well as the technical accuracy of authors, advertisers or speakers published in this newsletter are those of the individual authors, advertisers, and speakers. Therefore, no endorsement by the IEEE, its officers, or its members is made or implied. All material for THE SUNCOAST SIGNAL is due in electronic form by the end of day of the 1st Monday after the 1st Tuesday of the month, i.e. the ExCom meeting, preceding the issue month.

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Update for 2023: IEEE Florida West Coast Section Power & Energy Society/Industry Applications Society (PES/IAS)

IEEE FWCS PES/IAS Leadership:

Robert DeMelo, Chair // Ryan Copley, Vice-Chair // Kayla Allemang, Secretary



Can't believe we have closed the doors on 2022 and are now into the new year! Looking back at the past calendar year for the IEEE FWCS PES/IAS Chapter, a lot of great work was done in continuing to bring value to the IEEE community.

The picture to the left is from the end-of-year PES/IAS Chapter ExCom Appreciation dinner (some ExCom Members were not present but their appreciation did not go unrecognized). The dinner was a time to reflect on the work that was accomplished in 2022 and what is already in the works for 2023. We were happy to have our newest Member to the ExCom, Regan Sink, join us for dinner and we look forward to his contributions to the chapter.

If you are an IEEE Member and part of the FWCS PES/IAS and want to get more involved in volunteering time for the IEEE community, please email:

Robert.demelo@ieee.org

we would greatly appreciate your willingness to assist and contribute to the chapter. The IEEE FWCS PES/IAS team meets the last Thursday of every month, details/registration available in Vtools.

2022 Year-In-Review:

15 FWCS PES/IAS ExCom Meetings and Trainings

11 webinar and in-person events/tours totaling 506 IEEE Members and Non-Members in attendance

Partnered with SE Michigan, STEM, WIE, and Orlando chapters, as well as industry

Upcoming Events in 2023 – Be on the lookout in future Signal publications and on vTools:

February 16th – *Demystifying Impedance Calculations* (Virtual Event)

February 16th – *Tampa Bay Engineers Week Banquet*

July 16 – 20th – *IEEE PES General Meeting – Orlando*

Ever wondered where to look for upcoming events within the Florida West Coast Section or across IEEE, check out the link below and save it to your Favorites!

<https://events.vtools.ieee.org/>



DEMYSTIFYING IMPEDANCE CALCULATIONS Lunch-N-Learn

Date: Thursday, Feb 16, 2023

Time: 11:45am – 1:10pm (Eastern Time - New York)

Speaker: Thomas Blair, P.E., Engineering Fellow, Tampa Electric Company

CEH Credits: None

Course Level: Intermediate

Cost: Members: \$FREE Non-members: \$FREE

RSVP: Register at <https://events.vtools.ieee.org/m/330806>

Location: On-Line (Virtual)

This IEEE lunch and learn will cover the basics of performing impedance calculations and converting quantities from the P/Q plane to the R/X plane. The level of difficulty of this material is Intermediate. A background in power system analysis and the per unit system will be beneficial.

This lunch and learn will cover:

- ◆ Converting quantities from the P/Q plane to the R/X plane
- ◆ Converting P/Q and R/X quantities from primary to secondary values (as seen from PT and CT)
- ◆ Converting S and Z from one base to another base.
- ◆ Plotting generator P/Q diagram in excel format
- ◆ Plotting generator R/X diagram in excel format
- ◆ Develop 21 & 40 functions for generator protection
- ◆ Plotting 21 & 40 settings in excel format

- ◆ Comparing 21 & 40 settings to generator capability

A PowerPoint and excel file with example calculations will be provided as part of this lunch and learn session.

Presenter: Tom Blair, PE is an Engineering Fellow with Tampa Electric. He performs electrical system analysis and uses the results to specify electrical equipment ratings, protective relay settings, and electrical system arrangement. Tom has also been adjunct professor in the past at the University of South Florida and has presented courses at the university on topics such as Electrical Machines and Drives, Energy Production Systems Engineering, and the FE and PE (power) exam preparation course at USF. Mr. Blair is a Senior Member of IEEE.



An Unforgettable Encounter with an IEEE Senior Member

An Interview with Dr. Rafael Hernandez Millan, an IEEE Life Senior Member
by Lira Ngjelina, a senior-year Chemical Engineering student at the
University of South Florida

This week, I had the extraordinary pleasure of meeting and interviewing an IEEE Senior Member and an engineer with an impressive background, Dr. **Rafael Hernandez Millan**, with whom I found out that I share several interests. Such an interview was not only informative but an opportunity to vision my career differently.

I believe that to understand and learn about and from someone's background, it is valuable to get a glance at their early steps in life and overview the mechanics that shaped their motivations in work. Thus, I discussed first with Dr. Millan his beginnings.

Dr. Hernandez Millan was born and raised in a small, isolated island in the Caribbean. The island was very isolated that they only had a mechanical dial system. The phone call would first be transmitted to an operator, who would connect you to the individual you wanted to call. At the age of 15, he moved in Caracas, Venezuela, where he later finished high school. Moving to a different country was not easy. Dr. Hernandez Millan recalls with a smile, that on the first day of school, his classmates laughed at his accent. From 1963 to 1968, he finished his bachelor's in Electrical Engineering. During this time, he was also introduced to IEEE, in the region of Venezuela, and became a member.

The impact that IEEE has had on Rafael's life is astonishing. Ever since Dr. Hernandez Millan joined, he has been involved in events, organizations, and publications for over 50 years. The organization expanded his social and professional network, giving him the opportunity to meet individuals with great potential and ideas and share his own aspirations and ideas. Since, at the time when there was no internet, he used to read the publications in the newspaper every day. And the tradition continues. He published his own research and articles, as well. With this versatile background, Dr. Hernandez Millan applied and won a scholarship to finish his Doctorate in the UK. In 1973, he graduated with a Ph.D. from the Imperial College of Science and Technology of London.

After the adventure in London, he came back to Venezuela and was hired by his university as a researcher. Among many of the positions he took, he worked as head of planning for an electrical power

utility, in construction, grid development, telecommunication, and IPs. In one episode of his professional career, Dr. Hernandez Millan recalls being involved in the development of an online mailing system and a Voice-over IP. His company programmed and planned to launch their individual online mailing system for some profit. However, this project was launching at the same time as the big tech companies I came up with E-MAIL. Unfortunately, the product did not find a market. As the situation in Venezuela changed, Dr. Hernandez Millan and his wife had to move to the USA.

Currently, Dr. Hernandez Millan works on bringing sustainable solutions for industry products. One of his areas of focus is the development of hybrid batteries. The current electric car model is insufficient. It works well for short-distance trips, as an individual can charge them quickly and use them for the rest of the day. However, when it comes to long trips, the situation is different. It would take many hours to charge a motor vehicle which becomes insufficient for long trips. With one charge of the hydrogen fuel cells, any car can make the trip from Florida to California. In a similar manner the Hydrogen Fuel helps in long-term energy storage for houses.

Dr. Hernandez Millan advocates for a combination of the two batteries; one for the short term and one for the long term. This would be a hybrid solution for energy storage for cars, housing, and more. As an example, normal lithium-ion batteries are used in a daily cycle. They charge from 8:00 am until 4:00 pm and afterward this stored energy is used in the evening and night.

His picture of the future envisions a future where Carbon Emissions will be close to zero, and Carbon Dioxide will become part of the past similar to what happened in the usage of Chloro-fluoro carbons fluids for HVAC systems in many countries.

By chance, I found that my interests and Dr. Hernandez Millan's are quite similar. I inspire to one day give back to the community as he has done for many years. He is a pioneer in sustainability, a teacher, and a friend. My interview with him is an unforgettable encounter.



DISCOVER ENGINEERS WEEK Tampa Bay E-Week Banquet

This premier event brings together local leaders and engineering professionals to recognize the outstanding achievements of Engineers, Science Teachers, Math Teachers, and Students in our community. Additionally, awards will be presented to outstanding engineers, as well as local engineering students excelling in their engineering related studies and Young Professionals. The banquet also features the Lignell Awards. These awards, named after a former Chairman for the Institute of Electrical and Electronics Engineers (IEEE), are given to local High School educators who are performing outstanding work in the instruction of the STEM topics (science, technology, engineering and math). The organizers of the event recognize the important role these individuals play in encouraging students to pursue technological degrees in college. The banquet is a combination of efforts by all the Engineering Societies of West Central Florida. This event brings together professionals in all fields from all around Tampa and Florida's west coast.

DATE: Thursday, February 16, 2023

TIME: 4:30 - 6:30 PM Networking & Exhibition
6:30 - 9:00 PM Dinner Program & Awards

LOCATION:  522 N. Howard Ave
Tampa, Florida 33606

KEYNOTE SPEAKER: NICOLE STOTT



Nicole Stott is an Aeronautical Engineer that grew up in Clearwater Florida. She is a veteran NASA Astronaut with 104 days in space as a crewmember on both the International Space Station and the Space Shuttle. Highlights of her time in space include performing a spacewalk, flying the robotic arm to capture the first Japanese cargo ship, working with her international crew in support of the multi-disciplinary science onboard the orbiting laboratory, painting a watercolor in space (now on display at the Smithsonian Air and Space Museum), and of course the life-changing view of our home planet. In preparation for spaceflight, she also became a NASA Aquanaut as a crewmember on an 18-day saturation dive mission at the Aquarius undersea laboratory. She is co-founder of the Space for Art Foundation — uniting a planetary community of children through the awe and wonder of space exploration and the healing power of art. She has combined all of her experiences in a book titled *Back to Earth What Life In Space Taught Me About Our Home Planet – And Our Mission To Protect It*. She creatively combines the awe and wonder of her spaceflight experience with her artwork to inspire everyone's appreciation of our role as crewmates here on Spaceship Earth.

Register at : www.tbewb.org





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- ◆ Display Table in Reception Area

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- ◆ Receives recognition at Platinum Sponsor level on event slideshow & program.
- ◆ Receives recognition and link to website on the TBEWB website. Information about company and special acknowledgement will be made on the website.
- ◆ Display Table in Reception Area

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- ◆ Receives recognition and link to website on the TBEWB website.
- ◆ Display Table in Reception Area, (if space available)

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- ◆ Receives up to 2 tickets to the awards banquet.
- ◆ Has company logo displayed at Silver Sponsor level on event slideshow & program.
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- ◆ Receives up to 1 ticket to the awards banquet

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- ◆ Receives recognition at Vendor level in program and on the TBEWB website

Society or Company Table \$800 Early Bird (\$900 after 1/16/23)

- ◆ Receives up to 10 tickets to the awards banquet

Note that all donations may be tax deductible. FIN # 13-1656633

For more information please contact
Suzannah Folsom, PE, sfolsom@juturnaconsulting.com

A New Year of Connections and Impact for Florida West Coast Section

The Florida West Coast Section is a vibrant and energized section with multiple projects and activities planned in 2023, impacting the local community and members and students in the Florida West Coast, Region 3, and across the world.

The Section is supporting the 2023 Engineers Week Banquet in February, an annual event co-sponsored by all engineering societies represented in the Tampa Bay area. FWCS sponsors an annual awards slate at the banquet, recognizing two influential area high school teachers with cash awards, as well as awarding the achievements IEEE students and members.

FWCS continues to be a world-leader in membership development, particularly with respect to IEEE Senior Membership. The Section is partnering with Region 3 to support and expand the FWCS-developed Senior Member Roundup concept, which regularly supports members from all ten regions in IEEE by providing the means to become Senior Members. Continuing the momentum of the 2022 Senior Member Awards and Recognition Gala, FWCS is planning a broader membership recognition event at the end of 2023.

FWCS's Women in Engineering is enhancing meaning and purpose in membership and drawing in new members through a 2023 events and communications plan. WIE will continue to grow the value of FWCS membership through sponsoring events that will be jointly hosted with other FWCS chapters, and WIE is planning to empower women globally and contribute to the greater impact of FWCS through event collaboration with other chapters outside of Region 3. The WIE chapter will publish plans and accomplishments regularly in the Region 3 newsletter and in the FWCS Signal newsletter. Women in Engineering group is contributing to the Senior Member Elevation process by connecting with the women who are eligible for Senior Membership and providing the means to become a Senior Member through the Senior Member Elevation Committee Roundups.

The FWCS Power and Energy Society is implementing a communications plan to increase social media presence for communication about upcoming

events, as well as updates/pictures of past events to engage the IEEE community and bring more awareness and attention to the local section and chapters. PES is encouraging and reinvigorating chapter participation in the section and continue to lead Section cross-coordination/joint participation amongst the chapters within FWCS. PES will host at least two Distinguished Lecturer presentations in 2023, with one being from a female presenter.

The FWCS STEM Champion and Teacher in Service is a major contributor to the STEM Explorer Fest at Largo Central Park, carrying on the momentum from several significant STEM events in 2022. FWCS's Robotics and Automation Society is contributing significantly to the Bay Area Robofest in March, carrying on a tradition of connecting FWCS professionals with area students. RAS is also hosting a Distinguished Lecturer, Mario Guerrero of the Broward Section, and organizing a tour of the Tampa Bay Advanced Manufacturing and Robotics Center.

The FWCS Computer Society, jointly operating with the Aerospace and Electronic Systems Society, is preparing for a significant revitalization with new officers and activities. CS is planning to host a Distinguished Lecturer, CS President-Elect Jyotika Athavale, in partnership with the University of South Florida Computer Society and Hillsborough County school district. CS is partnering with the USF CS student chapter on a grant proposal for CS funding to support a major initiative for expanding the impacts of emerging technology into the Society.

The USF Student Branch of IEEE will continue tradition of hosting an annual IEEE picnic and an annual end of year banquet, in addition to regular speaking events hosted at the university. In 2022 the Student Branch collaborated internationally on two projects, co-hosting an internationally recognized speaker on Artificial Intelligence and the Law with the Student Branch at the University of Cape Town, South Africa, and co-hosting the then-president of IEEE, Kathy Land, with the University of Nairobi, Kenya.

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Continuing that momentum, the Student Branch will conduct a joint research project on engineering challenges around landmine identification, a project in progress with the Student Branch of the Universidad Nacional de San Antonio Abad del Cusco in Peru. The Student Branch will also continue the Student Interviews project from 2022, in partnership with FWCS Senior Membership, with a goal to connect students with Section senior members and publish interviews written by students.

The USF Student Branch of the IEEE Computer Society will undergo a major chapter revitalization this year. The Student Branch hopes to greatly increase participation by establishing fun new student events, such as a Hardware Hackathon with FPGAs, and a *Demystify* series of talks from researchers and industry leaders in core Computer Society areas.

The Student Branch also plans to build closer ties with the FWCS chapter through a new mentorship program and interviews with senior members. The USF CS chapter is starting the year off with a \$50k grant proposal to the Computer Society Emerging Technologies fund, a project that, if funded, will impact 10,000 students over the lifetime of the project.

At Florida Polytechnic University, the IEEE student branch is encouraging students to join IEEE by hosting different workshops like career development and soldering workshops on campus. The club is also reviving the RF/Amateur Radio Committee and planning to and host certification exams for members.

Senior Member Roundup**Saturday, February 4, 2023 - 12pm - 4pm****On-Line****Contact / Questions:** andrew.seely@ieee.orghermann.amaya.us@ieee.org**PES/IAS Planning Meeting****Thursday, February 23, 6:30 am – 7:30 am****On-Line****Contact/Questions:** Robert Demelo, robert.demelo@ieee.org

IEEE Aerospace and Electronic Systems Society (AESS) 50th Anniversary *Formed 15 January 1973*

The IEEE Aerospace and Electronic Systems Society (AESS) encompasses technical fields of system design for large aerospace systems, radio frequency, and electronic sensors, instrumentation and fusion of multiple subsystems. These subsystems are integrated with electronic devices and signal processing to provide capabilities in radar, navigation and guidance, space systems, and manned and unmanned vehicles with communications interfaces. This Society has significant breadth for attracting systems, sensors, and signal processing researchers.

In the early 1960s, there were developments in military and civilian aviation, particularly with the increased use of solid-state digital systems. Space, military, and civilian aviation came together in the growth of a tremendous aerospace industry with close ties to both NASA and the U.S. DoD.

A small group of aerospace leaders from the Institute of Radio Engineers (IRE) convened to understand the technological issues learned from World War II aerial warfare. As H. Warren Cooper stated,

They were developing new systems' capabilities with advanced aircraft, sensors, and communications techniques. In other words, a radar system makes use of microwave theory and techniques, antennas and propagations, electron devices, and ultrasonic ferroelectric and frequency control. All of these technologies go into the system. That started the new Aerospace and Electronic Systems Society to develop conferences, publications, and standards for new capabilities.

As a result of this study, the AES Society was formed on 15 January 1973.

After AESS was established, several key technologies were emerging to enable more efficient and greater systems advantages for aerospace and electronic systems. First, the most important technology was the availability of small form factor navigation subsystems based on satellite geo positioning systems. Next, the advent of integrated circuits, which made the sensors for aircraft and satellites more reliable and fostered the development of high-speed digital signal processing. Finally, the application of solid-state microwave components, which provided the capability for long-range sensing and communications for military and civilian uses.

The most important impetus for new technology was Moore's Law: the observation that the num-

ber of transistors in a dense integrated circuit (IC) doubles about every two years. Moore's Law is an observation and projection of a historical trend. However, the development of solid-state physics and circuitry have maintained this capability for not only digital electronics but microwave monolithic circuits for the past 60 years. These technology advances helped propel new applications in space and airborne platforms, adaptive and electronically steered antennas, and high-speed signal processing. The new systems' capabilities will be illustrated in the following sections.

SPACE AND AIRBORNE PLATFORMS The Global Positioning System (GPS) was one of the early aerospace systems developed to provide the position of military sensing platforms and eventually civilian use, over a high percentage of the Earth. The constellation of GPS satellites, shown in Figure 1, provides accuracy within 10 m worldwide.

When combined with an onboard inertial navigation system (INS), the platform has an accurate capability for position, velocity, orientation, and time. This technology has enabled sensing platforms to be independent of expensive and bulky navigation subsystems, which were originally required on all airborne surveillance platforms. Satellite sensing includes radars, electro-optical imaging, communications relays, and direct broadcast signals for television and entertainment.

Based on many significant advances in sensor components and space qualified signal processing, a small constellations of satellites can provide accurate update on earth surface radar imaging. Similar microsatellites, as illustrated in Figure 2, will provide wideband datalinks for providing telecommunications and data links to remote regions [4]. Modern platforms for high altitude long-endurance (HALE) air vehicles, such as shown in Figure 3, provide a persistent imaging and communications platform in remote regions [5].

The evolution of composite materials and onboard electro-optical and radar sensors provided long range sensing of Earth surface features using synthetic aperture radar (SAR), ground moving target indication (GMTI) modes, and interferometric radar (In SAR) for terrain height and land use features.

Reprinted from AESS Magazine Jan 2023



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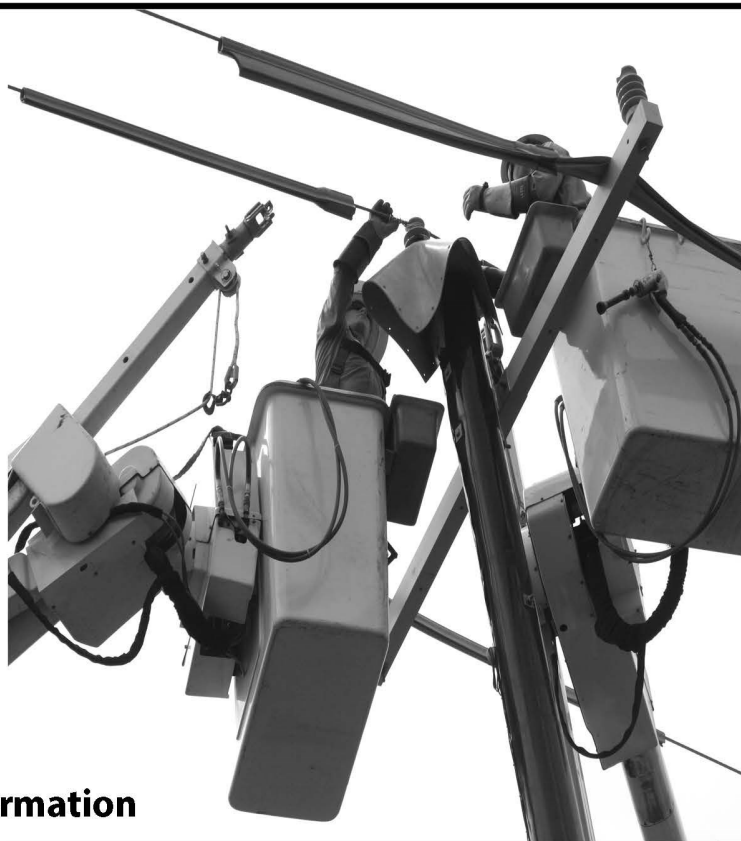
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Insert / Sheet	\$200	\$260	\$800	\$1,000	\$2,000	\$2,400

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February 2023 - Calendar of Events (For more information see "Inside the SunCoast Signal" → Page 1)

Sun	Mon	Tue	Wed	Thu	Fri	Sat
			1	2	3	4
						*SM Roundup →Page 9
5	6	7	8	9	10	11
		*FWCS ExCom →Page 1				
12	13	14	15	16	17	18
	*Signal Inputs Due End of Day			*Impedance Calc. →Page 4 *Eng. Week Banquet →Page 6		
19	20	21	22	23	24	25
				*PES/IAS Planning →Page 9		
26	27	28				