VOLUME 24, ISSUE 9

Lockheed Martin Management Association Retirees

Newsletter

Looking Forward Towards A Wonderful Retiree Future!

SEPTEMBER 2016

INSIDE THIS ISSUE:

Needed: Staff Help

LMMAR needs volunteers to help keep LMMAR going. We have several vacancies on the Board and we particularly need a secretary and a newsletter editor. If you think you can help please contact:

Norm Dhom, Membership Chair – (408) 732-2742

Jerry Vaughan, Treasurer – (408) 985-2708

Your Story We need your input. Have you done anything exciting lately? Do you have any news that might be of interest

to our members? Your story and photo is welcome! Email it to: jerry.allan.vaughan@gmailcom

Sunshine If a member knows of anyone ill or grieving, please send an email to Karen Stayrook at: karenstayrook@comcast.net or call (408) 622-5539

End of an Era: by Lauren Duda — POSTED ON AUGUST 8, 2016

Over more than 60 years, Space Systems' Sunnyvale team produced more than 3,000 equipment sections for the Fleet Ballistic Missile (FBM) program.

FBM has played a critical role in national defense for more than half a century.

The equipment section is the "backbone" of the missile, housing flight electronics that help guide the missile on its course and carrying the nuclear payload.

Sixty years. More than three thousand equipment section structures. Each one carefully hand-crafted by Lockheed Martin employees in Sunnyvale, California.

The equipment sections were produced for the U.S. Navy's Fleet Ballistic Missile (FBM) program, which has played a critical role in national defense for more than half a century.

Since its inception in 1955, FBM has evolved through different missile generations: first as Polaris, later as Poseidon, then Trident I and currently the Trident II D5 missile—the world's most reliable large ballistic missile with 160 successful test flights since 1989. Overall, Lockheed Martin developed six missile generations as the Navy's strategic missile prime contractor, each more capable than its predecessor.

The equipment section—known as the "backbone" of the missile—undoubtedly played a part in this longstanding success, as did the Lockheed Martin team who made it possible.

FBM focuses on nuclear deterrence, a task whose complexity requires equipment that is precise and high-fidelity. The apex of this precision comes in the form of the equipment section, which functions as the backbone of the missile. It houses flight electronics that help guide the missile on its course and carries the nuclear payload.

Something like the equipment section that is home to vital systems must be crafted with meticulous attention to detail. Such was the task of the Lockheed Martin team that built it. Each of the 3,000 equipment sections over the life of FBM—with today's iteration measuring approximately 8 ft. in diameter and 5 ft. tall—was carefully pieced together by hand.

And not a single one of those 3,000 sections was scrapped due to a production mistake.

John Muraoka, Rick Altamirano, James Moffett and Joe Diniz became involved in equipment section production differently, yet they all share the same sentiment about FBM.

John Muraoka, who works in the FBM Program Office and has been on the program for 35 years, spoke highly of the impact that their craftsmanship had when building the sections.

"Each one is uniquely built. They were originally designed to last 25 years, and they have extended life of missile out to 35-40 years."

The D5 section is made from a special, composite graphite fabric, and from fabric layout to delivery, one year was needed to build an equipment section. As a whole, the current FBM Trident II D5 missile is comprised of about 10,000 parts, including those in the equipment section.

"It took about two years for a technician to become totally proficient at building their part of it," said Rick Altamirano, FBM Structures group leader, on the expertise required to build the section.

When the Navy reached its procurement objective of Trident II equipment sections and chose to build future FBM materials with modernized production techniques, the team knew it was truly the end of an era. The final two equipment sections for FBM were completed in June 2016, marking a total of 592 for the Trident II D5 program.

"When we sat down and thought about it as the program came to a close, we found we really wanted to focus on the decades of manufacturing and all the dedication, time and effort put in by so many people over 60 years," said James Moffett, FBM Manufacturing senior manager.

James insisted that during the final push of equipment section production, he was most proud of how the team came together to finish out strong.

"What I take pride in is the team that we pulled together during the last year and a half. From John in the program office, to Rick on the touch labor side, to Joe on the manufacturing front. We would have had to requalify suppliers and our production processes in order to procure or manufacture additional parts, so we had to treat the final ones like 'golden eggs.'"

The team not only rose to the challenge of their mission, but they also successfully placed almost all of equipment section employees in other manufacturing areas, mostly within FBM.

"They are all highly skilled and valued technicians, and so we worked to place them in other manufacturing jobs," explained Joe Diniz, a manufacturing manager on FBM for just over a year. "The most important part was we transitioned folks off gradually as their portion of production finished."

"After being on FBM for more than 35 years, it's like watching one generation end and a new one begin," offered John. "It's definitely bittersweet to not have an immediate development follow-on program, but knowing the out-

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standing work we did all those years makes me proud."

The sixty-year partnership with the Navy does not end with close of equipment section production for today's FBM fleet. Trident II D5 will now enter a phase focused on sustainment and life extension—likely through the life of the next FBM iteration, planned for deployment out to 2084. The D5 life extension program incorporates current technologies into the missile's electronics to prolong the service life of D5s on current and future submarine platforms.

The Trident II D5 missile, aboard U.S. Navy Ohio-class and Royal Navy Vanguard-class submarines, was first deployed more than 25 years ago in 1990. To assure the system's continued readiness, more than 2,000 dedicated Lockheed Martin employees continue to work side-by-side with Navy personnel at FBM sites across the U.S and U.K.

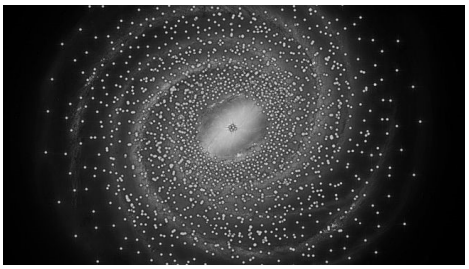
When production officially ended this summer, program management from both Lockheed Martin and the Navy attended the celebration event in Sunnyvale.

"They congratulated and thanked us for all the work we've done over the years on FBM. It really conveyed to employees that what we do is important," remarked John. "It was everyone—Production, the Program Office, Integrated Planning, Engineering, Supply Chain, Quality—who made it possible."

Anomaly in Our Galaxy

A vast tract of space near the center of the Milky Way - in an area called the inner disk - is completely devoid of young stars, new research shows.

The Milky Way, which hosts Earth's solar system, is a spiral galaxy containing billions and billions of stars. By measuring the distribution of these stars, astronomers can better understand how the Milky Way formed and developed over time.



Artist's impression of the large stellar void stretching 8,000 light-years from the center of the Milky Way.
Credit: The University of Tokyo

Young stars called Cepheids are good growth markers because they regularly pulsate in brightness and the pulsations are tied to their overall luminosity. This means astronomers can monitor the duration of bright periods and estimate the stars' distance from Earth based on how bright they appear. But in the Milky Way's inner disk, which extends for 8,000 light-years (about 47,000 trillion miles!) from the galactic core, researchers haven't found any of those young stars, and that observation challenges current theories on Milky Way formation, officials said in a statement from the Royal Astronomical Society.

"The current results indicate that there has been no significant star formation in this large region over hundreds of millions years," Giuseppe Bono, co-author of the new research and astronomer at the Rome Observatory, said in the statement.

With the Milky Way itself measuring about 100,000 light-years across, the researchers noted that this stellar desert comprises a lot of empty space.

"Our conclusions are contrary to other recent work but in line with the work of radio astronomers who see no new stars being born in this desert," Michael Feast, co-author of the new research and astronomer from the South African Astronomical Observatory, said in the statement.

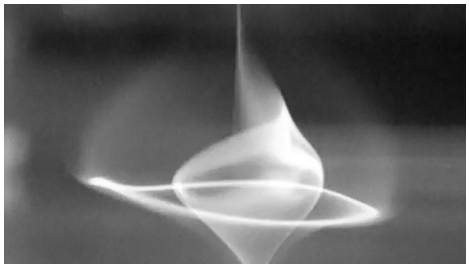
The new work was published June 27 in the Monthly Notices of the Royal Astronomical Society.

Fire Tornado

Kevin Byrne, AccuWeather.com Staff Writer, August 16, 2016

Researchers accidentally discovered a new type of blue fire that could prove valuable when cleaning up major oil spills.

The fire was detected while researchers investigated uses for fire whirls, also known as firenados.



Faculty members from the University of Maryland's A. James Clark School of

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Engineering were initially working to understand the burning dynamics of fire whirls on water. During their experiment, they discovered an eco-friendly "blue whirl," which had transitioned from a standard yellow flame.

The optimal, clean burning of the blue fire could be valuable when it comes to cleaning up oil spills and meeting worldwide demand for high-efficiency, low-emission combustion, the researchers said.

"A fire tornado has long been seen as this incredibly scary, destructive thing, but, like electricity, can you harness it for good? If we can understand it, then maybe we can control and use it," Michael Gollner, assistant professor of fire protection engineering and co-author of the paper, said in a statement.

He said this is the first time fire whirls have been studied for practical applications.

"Fire whirls are more efficient than other forms of combustion because they produce drastically increased heating to the surface of fuels, allowing them to burn faster and more completely. In our experiments over water, we've seen how the circulation fire whirls generate also helps to pull in fuels," Gollner said.

One of the current oil spill remediation techniques is to gather crude oil into a thick layer and burn it in place on the water. However, that process is seen as inefficient and incomplete, and it also releases lots of smoke into the air.

"Blue in the whirl indicates there is enough oxygen for complete combustion, which means less or no soot, and is therefore a cleaner burn," Dr. Elaine Oran, a Glenn L. Martin Institute professor of engineering and co-author of the paper, said.

Generation Beyond Program

Lockheed Martin has supported every NASA mission to Mars over the last four decades and is currently developing technologies like the Orion spacecraft to help NASA send humans to deep space destinations like Mars in the 2030s. Generation Beyond brings the science of space into homes and classrooms across America to engage students in grades 6-8 and help them prepare to make these missions a reality and pursue STEM careers.

The program, available at no cost, includes an online curriculum for teachers and families, with standards-based, digital resources such as lesson plans, educator guides and family activities. These resources will introduce a wide variety of STEM-focused careers in space exploration, compare and contrast differences between life in space and on Earth, and illustrate the challenges of a future Mars mission. The program also features these upcoming engaging opportunities:

GENERATION BEYOND STUDENT VIDEO CHALLENGE: Students will create a short one-to-two-minute video explaining how they would design the habitation module for the first crew to Mars. Students can enter individually or in a group of up to four members from now until December 15, 2016. A grand prize winning team or individual winner will win a $10,000 cash prize. Second place will receive $5,000; third place will receive $2,500. Participants can enter here: www.lockheedmartin.com/generationbeyondinschool.

VIRTUAL FIELD TRIP, SPACE WEEK – OCT. 4 at 1 p.m. ET/10 a.m. PT: During Space Week, which runs October 4-8, classrooms worldwide can participate in a virtual fieldtrip live from the Lockheed Martin Spacecraft Operations Simulation Center in Littleton, Colorado. Students will virtually meet Lockheed Martin experts, discuss their career paths and deep space exploration experiences. Attendees will learn how space flight leads to innovation here on Earth. Sign-up and program resources are available at:www.lockheedmartin.com/generationbeyondinschool.

“This program allows me to integrate these resources into my classroom instruction and spark students’ interest in space exploration and enhance their STEM skills,” said Patti Grammens, science teacher at Forsyth County Schools in Georgia. “Generation Beyond helps me to engage students in insightful conversations about deep space and introduce them to various careers in this field. These cutting-edge resources will make science relevant and exciting for my students.”

“Lockheed Martin has been involved in many NASA missions to space, and now we’re helping take astronauts farther into space than ever be-

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fore. STEM careers take us there and so much more. For us to successfully design and navigate deep space missions, build cutting-edge aircraft and engineer solutions that help protect our nation, we must have the skilled workforce to get the job done," said Stephen Frick, former NASA astronaut and Director of Strategic Planning and Operations at the Lockheed Martin Space Systems Advanced Technology Center (ATC).

Frick added, "We want to inspire kids to become the next generation of engineers and space explorers by pursuing STEM paths. Generation Beyond uses space exploration, an area that already generates excitement among young people, to show students how focusing on math and science will take them to places they've never dreamed, including another planet."

In addition to the online curriculum, the Generation Beyond program includes the Mars Experience Bus, which takes students on a mobile virtual reality trip to the surface of Mars. The program also features the Hello Mars app, which allows users to check the weather on Mars in real-time.

LM-100J Commercial Freighter

MARIETTA, Georgia, Aug. 18, 2016 – The first LM-100J commercial freighter continues to make significant progress, reaching major production milestones at the Lockheed Martin (NYSE: LMT) facility here.

The LM-100J is the commercial version of Lockheed Martin's proven C-130J Super Hercules aircraft — the unmatched airlifter of choice for 16 nations. The LM-100J will perform as a commercial, multi-purpose air freighter capable of rapid and efficient cargo transport.

Recent production accomplishments

include the completion of the aircraft wings; delivery of the empennage, manufactured by the Tata Lockheed Martin Aerostructures Ltd. (TLMAL) joint venture in India; commencement of cabtop construction; and the arrival of the LM-100J's cargo deck, manufactured at Lockheed Martin's facility in Meridian, Mississippi.

"As this first LM-100J Super Hercules freighter progresses in production, so does a new era in commercial aircraft operations," said George Shultz, vice president and general manager, Air Mobility & Maritime Missions at Lockheed Martin. "Our existing L-100 operators have repeatedly shared with us that the only replacement for a Herc is a Super Herc,and we are proud to meet this demand with the LM-100J. There is a significant global requirement for commercial freight operations to support operations in more austere areas. The LM-100J will not only meet these demands, but exceed them by delivering new and unmatched capabilities to the commercial marketspace by transporting cargo on any runway, anywhere, all the time."

The first LM-100J will progress through final production phases over the next few months, with an anticipated first flight in the first half of 2017.

The LM-100J incorporates technological developments and improvements over the existing L-100s that have resulted from years of military C-130J operational experience — including more than 1.3 million flight hours. The result of this experience and advancement translates to an aircraft that will deliver reliable service in a multi-role platform for decades to come.

Star One Credit Union Educational Workshops

Workshops are free to members and non-members.
RSVPs are Required. Please call (866) 543-5202 toll free, visit a Branch, or register online at www.starone.org.

Age Well, Plan Well

Sept. 14, 2016, 5:30pm -7:30pm

Star One Administration Building, 1306 Bordeaux Drive, Sunnyvale

Description: Planning for your family's future is an important step in taking care of the people that you love. Star One is hosting a workshop to provide members and their family members an opportunity to learn the first steps of estate planning and other helpful ways to prepare for future needs. Special Guest Speaker Panel to include: Nancy Williamson, Estate Planning Attorney at Law, Terry Nellis, Neptune

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Society and Linda Conti, Pathways. Star One's Beneficiary Retiree Services Department team will be on hand to answer questions regarding how Star One Credit Union can help. Please plan to join us for this valuable workshop.

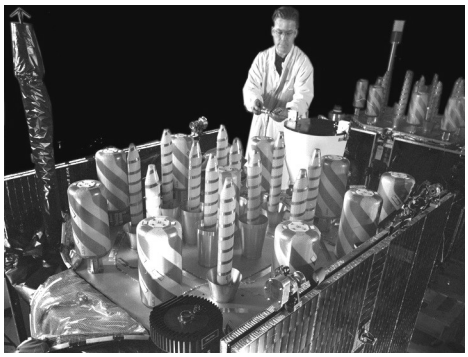
Moving your Retirement Dollars – IRAs & 401(k)s

October 5, 6:00pm – 7:30pm
Location: Blossom Hill Branch,
1090 Blossom Hill Road, San Jose

Description: In this workshop, we will explore the most important transitions from Rollover Options to IRA Plan programs and their effective use. Learn how to plan for a transition, potential pitfalls that await the unwary participant, navigate through the maze of options and opportunities, and how to keep options open without creating tax traps. We will discuss options and learn what to expect whether you are changing jobs, retiring soon or planning ahead.

Lockheed Martin, University of Colorado Boulder Partnership

Boulder, Colo., Aug. 25, 2016 – Lockheed Martin (NYSE: LMT) and the University of Colorado Boulder (CU) are establishing new academic programs through a multi-million-dollar agreement that will develop the next generation of space engineers. The Lockheed Martin Radio Frequency (RF) Space Systems Research Center will boost engineering expertise at the school and create new curriculum to fill in-demand skills in the space sector. The $3 million sponsorship by Lockheed Martin, spread over four years, will establish new academic programs focused on radio frequency (RF) systems. RF fields address commercial, civil and military needs for communications, radar and photonics. Engineers in this field will develop innovative approaches for tracking, navigation and control of spacecraft as well as next-generation global navigation technologies.



"Each person depends on RF technology in one way or another, from television and radio, to phone communications, to GPS navigation," said Keoki Jackson, Lockheed Martin's chief technology officer. "As the complexity of our satellite systems and national security solutions grows, so does our demand for world-class talent. This partnership ensures that University of Colorado graduates have the skills they need to build the systems of the future while also advancing Lockheed Martin's ability to develop revolutionary and relevant innovation."
"We greatly value our partnership with Lockheed Martin to propel our students, the aerospace industry and the state of Colorado to even greater heights," said CU Boulder Chancellor Philip DiStefano. "This partnership is particularly gratifying because of our long and productive relationship with one of the titans of the industry."
The industry-academic partnership will benefit students and faculty by creating:

- A new master of science in electrical engineering with an RF focus.
- A new, established path for bachelor's degree students in Aerospace Engineering Sciences to obtain a master's degree in Electrical Engineering. Similarly, those pursuing an Electrical Engineering bachelor's degree will have a path to obtain a master's degree in Aerospace Engineering Sciences.
- A Lockheed Martin Chair of RF Engineering, a faculty position dedicated to RF teaching and research.
- A Lockheed Martin Faculty Fellow, a professor supporting research and academic activities of a key faculty member in the new educational programs.
- Lockheed Martin Graduate Fellowships, consisting of graduate students working at Lockheed Martin or projects relevant to the company.

Students and graduates will be able to take advantage of the RF Payload Center of Excellence at Lockheed Martin's Waterton Canyon site, which is the company's hub for RF space technology development.

Lockheed Martin employees will also benefit from the new relationship. For example, the new RF-focused degree programs will offer unique skills training for employees who want to take advantage of opportunities in the RF Payload Center of Excellence, which has added over 60 jobs in the past six months.
The CU research center continues a strong partnership between the university and Lockheed Martin, a relationship that funds joint research programs, supports student design projects and facilitated a cubesat mission. Lockheed Martin has sponsored nearly $7 million in research at CU and is working to start new projects totaling $650,000 by the end of the year. In 2015 Lockheed Martin hired graduates from 15 CU majors, and the corporation employs more than 500 alumni working in its Space Systems division alone.

LMMAR LUNCHEON

Costume Contest - Best, Scariest, Most Original, Etc.

A HALLOWEEN SCARE JOIN US IF YOU DARE!

OCTOBER 28, 2016

MICHAEL'S AT SHORELINE
2960 N. SHORELINE BLVD.
MOUNTAIN VIEW, CA 94043

11:15 AM. SOCIAL - NO HOST BAR

12:00 P.M. LUNCH
Entrée Choices:
(1) Wicked Beef Burgundy
(2) Possessed Chicken Breast Kiev Stuffed with Herb Butter And Cheese
(3) Warlock Style Baked Salmon with Dill Sauce
(4) Vegetarian dish upon request only
All Entrees Served With Bread, & Mysterious Salad (Fresh Greens),
Cauldron Brewed Regular or Decaf Coffee, Tea
Bewitched Pumpkin Pie

12:45 P.M. Speaker
Costume Contest to follow

Speaker

John Kowalchik
Vice President, Mission Success
LMMAR Executive Advisor

Subject: to be announced

RSVP BY October 24. 2016
Make check payable to LMMAR and mail to:
LMMAR
P.O.BOX 2117
SANTA CLARA, CA 95055-2117

$25 PER PERSON

For information or refunds, call Lucille Wilson 408.225.9566 or Gay Morgan 408.243.2233
Cancellations not accepted after Monday prior to the Friday luncheon
Please do not leave messages on answering machine.

Please count on the following to attend the Friday, 28th of October luncheon:

1. Beef Burgundy
2. Chicken Breast Kiev
3. Salmon

Name

1. Beef Burgundy
2. Chicken Breast Kiev
3. Salmon

Name

1. Beef Burgundy
2. Chicken Breast Kiev
3. Salmon

Name

1. Beef Burgundy
2. Chicken Breast Kiev
3. Salmon

Name

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SEPTEMBER 2016

Activity Calendar

- **LMMAR Executive Board Meeting**. First Monday of each month unless holiday conflict, then second Monday. 9:30 a.m. Star One Administration Building, 1306 Bordeaux Dr.— Members are welcome to attend. Call Norm Dhom to arrange attendance — (408) 732-2742.

- **LMMAR Newsletter Mailing Session**. Volunteers needed. Second Thursday of each month. 9:30 a.m. Star One Administration Building, 1306 Bordeaux Dr. — Call Norm Dhom to arrange attendance — (408) 732-2742.

- **LMMAR Bridge Card Players**. Join the fun! Every Tuesday and Thursday, 11:30 a.m. at the Willow Park Condominiums located at the NE corner of Moffet Blvd. and Middlefield Road in Mountain View. Entrance is from Moffet Blvd. Contact Dave Himmelblau, 'phone No. 650 968-1121.

- **LMMAR Halloween Luncheon & Costume Event** October 28th at Michael's at Shoreline

- **LMMAR Holiday Luncheon** December 9th at Michael's at Shoreline. For further information, please contact Lucille Wilson at 408-225-9566 or Gay Morgan at 408-243-2233

- **Lockheed Martin Blood Bank Drive**. Second Wednesday of each month. 8:00 a.m.– 3:00 p.m. Bldg. 163. LMMAR Contact Norm Dhom (408) 732-2742.

- **Lockheed Martin Retirees Investment Group (LMRIG).** Meets last Thursday of each month, 1:00-2:00 p.m. Meeting place to be determined. Dues are $2. Contact Don Kinell (650) 948-1520 or Martin Abelow (408) 253-6924.

For your financial needs, please contact Star One Credit Union at www.starone.org or (866) 543-5202 toll free.

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