



Lockheed Martin Management Association Retirees Newsletter

Looking Forward Towards A Wonderful Retiree Future!

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JULY 2016

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

BREXIT

New York Times, 6/24/16
Neil Irwin @Neil_Irwin

Things fall apart. And now, “things” includes the European Union.

British voters delivered a well-aimed kick at the global elites who prefer a Britain that is deeply intertwined, economically and diplomatically, with Europe.

So now that they did it, what does it mean for the British economy and the rest of the world?

With the caveat that nothing is really clear in the immediate aftermath of a seismic event like the one that happened Thursday, here’s how to think about the economic forces that have been unleashed and how we can expect them to play out in the weeks and

months and years ahead.

In the short run . . .

If you run a British company that exports a lot to Europe, or manage a European bank with thousands of employees in London, nothing much changed with the results Thursday.

Britain is a member of the European Union today, and will be one tomorrow. Your products can still be shipped to Düsseldorf without any hint of a tariff. Your employees can work legally whether their passport is from Sweden or Spain.

The immediate effects of “Brexit” will flow almost entirely through financial markets. Markets may be flawed, but they really do amount to a real-time verdict by millions of people with vast sums of money at stake on what

something will be worth over the indefinite future. Economic shifts happen slowly; financial shifts happen overnight (literally, in this case).

The truth is that the stock market declines that took place worldwide Friday are nothing to be too concerned about. The British stock market, as measured by the FTSE 100 index, was down 3.2 percent late Friday afternoon in Britain, above its levels of mid-June. That suggests that investors do not envision the Brexit hit to hammer corporate profits in the near future.

But what is happening in the bond and currency markets suggests bigger problems are brewing. The 7.6 percent drop in the British pound against the dollar is indeed a seismic move — major currency pairs just don't do that. Since 2012, the average daily move in the pound-dollar exchange rate is 0.35 percent. This move is 21 times that.

Combined with a rally in British government bonds (and consequently lower interest rates), the currency shift will mean a burst of inflation for British consumers as imported goods become sharply more expensive. It will also make the nation's export industries more competitive (for the moment, at least).

In the medium run. . .

As the months pass, the economic consequences of Brexit become less about financial market disruptions and more about real economic activity. Within Britain, a pall of uncertainty is likely to be cast over every business's

decisions on whether to hire people or make capital investments — and that's true of both British-owned businesses and the many affiliates of global companies in Britain.

If you're an American company that has its European headquarters in London, do you keep calm and carry on? Or do you start checking out real estate in Frankfurt or Dublin or some other place where the relationship with the E.U. is more settled? If you run a British company thinking of building a new factory, do you start to entertain the same question?

Even if the ultimate answer for these companies is "remain," it is easy to see how the desire to wait for clarity could hold back economic activity for many months to come — and perhaps beyond British borders.

And the decision comes at an uncomfortable time. The world's central banks, normally the first responders in times of economic distress, are poorly positioned to help. Those banks have signaled that they are ready to act, with statements from the Bank of England, the European Central Bank and the Federal Reserve promptly dispatched Friday morning.

And it is looking as if the Fed is leaning toward easier money in the wake of Brexit. Futures markets priced in a 50 percent chance of a Fed interest rate hike Thursday, but that fell to 14 percent Friday after the news, along with a 12 percent chance of an interest-rate cut this year.

RD-180 Rocket Engine Replacement

The U.S. Air Force awarded two public-

private partnerships to develop a replacement for the Russian-built RD-180 engine. The first team is composed of a joint effort of United Launch Alliance (ULA) and Blue Origin. (Boeing and Lockheed Martin are the two partners comprising United Launch Alliance). The second team is Aerojet Rocketdyne, a company that has been working for years to persuade the U.S. Air Force to back the development of the AR1 engine as a replacement.

The two teams will have until 2019 to design, build, and test the new engine for use on new launch systems such as the Vulcan. With Russia's military actions in Ukraine, the RD-180 came under increased criticism. U.S. organizations began looking at developing their own engines.

The RD-180 has been a workhorse for ULA in terms of launching the Atlas V. With the aforementioned international concerns, Congress has worked to restrict the importation of the engine.

Many solutions have been proposed including starting U.S. production of the RD-180, scaling back launches of the Atlas V to those that can only be supported by the remaining engines — or designing something new. The Air Force appears to have chosen to pursue a new engine design.

The ULA / Blue Origin team is proposing the use of the BE-4 — a liquid oxygen, liquefied natural gas (LNG) rocket engine that delivers an estimated 550,000-lbf (2.45 MN) of thrust at sea level. The engine is currently being

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tested at Blue Origin's facilities located in West Texas. The rocket engine has been in development for more than four years now.

"While the RD-180 engine has been a remarkable success with more than 60 successful launches, we believe now is the right time for American investment in a domestic engine," said Tory Bruno, ULA's president and chief executive officer. "As America's ride to space, we continue to meet our goal of delivering the most reliable launch systems at the most affordable cost, while developing a new rocket which enables brand new opportunities for the nation's use of space."



In addition to replacing the RD-180, the BE-4 is designed to power Vulcan, ULA's next generation launch vehicle. Two BE-4s would power each ULA Vulcan booster, providing some 1,100,000-lbf (4.9 MN) of thrust at liftoff. Vulcan will launch from Space

Launch Complex 41 at Cape Canaveral Air Force Station in Florida and Space Launch Complex 3 at Vandenberg Air Force Base in California.

Aerojet Rocketdyne was the second team selected to develop engine technology replacing the RD-180. The AR1, like the BE-4, has been in development for some time, making the Air Force's selection of the engine as a potential replacement almost a certainty.

"This award from the U.S. government demonstrates its support of AR1 and recognizes the priority of assured access to space for our critical national security assets," said Eileen Drake, CEO and President of Aerojet Rocketdyne. "The AR1 engine is the option with the least technical risk that allows the United States to quickly and efficiently transition off its use of Russian-supplied engines currently used on the Atlas V launch vehicle."

The engine is touted as being developed using modern methods, which are being employed to end the use of Russian engines on Department of Defense missions.

"AR1 will return the United States to the forefront of kerosene rocket propulsion technology," added Drake. "We are incorporating the latest advances in modern manufacturing, while capitalizing on our rich knowledge of rocket engines to produce a new, state-of-the-art engine that will end our reliance on a foreign supplier to launch our nation's national security assets."

Aerojet Rocketdyne believes the liquid oxygen/kerosene-fueled AR1 to be the first engine produced in the United States to use an advanced oxidizer-rich staged combustion kerosene engine cycle.

This engine, like the BE-4, can be used on a variety of launch vehicles.

According to Drake, "This engine will be available for use on the Atlas V, Vulcan and other launch vehicles currently in development."

Immediately after the Air Force announcement, Aerojet Rocketdyne released a statement confirming a partnership similar to ULA and Blue Origin. Aerojet Rocketdyne has with Dynetics, a Huntsville Alabama-based engineering firm, to complete development of the AR1.



"We are proud to be able to use Dynetics proven hardware fabrication capabilities and engineering expertise to join Aerojet Rocketdyne in this important endeavor", said Steve Cook,

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vice president for Corporate Development at Dynetics. “Our large-scale manufacturing capabilities and extensive aerospace systems expertise, combined with Aerojet Rocketdyne’s leading rocket engine technology, offer a fast and low risk way to end U.S. reliance on Russian space launch propulsion systems.”

Under the agreement, Aerojet and Dynetics will increase their cooperation on the development of the AR1. The two companies have been working on some components of the engine design for the last 18 months. Under the agreement, Dynetics will provide support in three key areas including the AR1 engine’s main propulsion system, the ignition system and ground support equipment. Dynetics will also provide analysis support to Aerojet Rocketdyne.

“The AR1 engine is the right catalyst for moving our nation away from Russian reliance and returning America’s preeminence as a propulsion leader,” said Jim Simpson, senior vice president of Strategy and Business Development at Aerojet Rocketdyne. “Our collaboration with Dynetics in developing key AR1 components is an essential element to having a certified engine in 2019.”

The two firms have been working together to develop and test 3D printing or additive manufacturing for key components of NASA’s Space Launch System (SLS). That component will be used in the one million pound thrust booster as part of the Advanced Boost-

er Engineering Demonstration and/or Risk Reduction (ABEDRR) contract.

Both teams have invested heavily into their engine designs. Despite financing from the Air Force, both teams will have to pay a combined \$268 million. The U.S. Air Force intends to initially obligate \$115.3 million. The total potential government investment, including all options, is \$536 million.

Sensor Systems Contract

Fairfax, Va., June 21, 2016 – Lockheed Martin (NYSE: LMT) has officially been awarded the Sensor Systems - Aerial Intelligence, Surveillance and Reconnaissance (SS-AISR) task order on the R2-3G indefinite delivery, indefinite quantity contract vehicle by the U.S. Army Contracting Command – Aberdeen Proving Ground (ACC-APG). Under this one-year base/two one-year options contract valued at \$733 million, Lockheed Martin will support the ACC-APG to modernize sensor equipment and platforms that support AISR data collection, air- and ground-based processing, exploitation and dissemination for missions worldwide.

Lockheed Martin Information Systems & Global Solutions (IS&GS) will provide personnel to manage, operate, train and maintain reliable and efficient systems, equipment, facilities and logistical infrastructures in order to operate, sustain and improve equipment performance, as well as reduce life-cycle costs for the systems supported. The team will also conduct Airborne Sensor Operator, Sensor Maintainer, Intelligence Analyst and Airborne Crew Coordination training of U.S. Army soldiers at multiple stateside and over-

seas locations.

“Our team is bringing the latest airborne technology advancements to the soldiers in the field, ensuring greater mission success and warfighter protection,” said TW Scott, vice president, Technical Services, Lockheed Martin IS&GS.

The contract transition period will span from late May through late July 2016. Performance could extend through March 2019 if the two one-year extension options are exercised.

Guided MLRS Rocket Contract

DALLAS, June 15, 2016 – Lockheed Martin (NYSE: LMT) received a \$331.8 million contract from the U.S. Army for Lot 11 production of Guided Multiple Launch Rocket System (GMLRS) rockets. The contract calls for the production of GMLRS Alternative Warhead rockets, GMLRS Unitary rockets and Reduced-Range Practice Rockets (RRPRs) for the U.S. Army, U.S. Marine Corps and for Foreign Military Sales (FMS) to Israel, Finland, Jordan and Singapore.

Work will be performed at the Lockheed Martin facilities in Camden, Arkansas, and Dallas. All production deliveries are anticipated to be completed by March 2018.

“Our domestic and international customers continue to display their confidence in this combat-proven system by placing orders for the family of MLRS munitions, including the new GMLRS Alternative Warhead round,” said Ken Musculus, vice president of

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Tactical Missiles for Lockheed Martin Missiles and Fire Control. "Guided MLRS is trusted, reliable and affordable."

GMLRS is an all-weather rocket designed for fast deployment that delivers precision strike beyond the reach of most conventional weapons. The new GMLRS Alternative Warhead (AW) was the first munition developed to service area targets without the effects of unexploded ordinance, complying with DoD cluster munitions policy. GMLRS Unitary rockets greatly exceed the required combat reliability rate and have established a reputation for affordability. The RRPR allows users to train with realistic, full-motored rockets with limited flight range, making them ideal for smaller testing ranges.



In combat operations, each GMLRS rocket is packaged in an MLRS launch pod and is fired from the Lockheed Martin HIMARS or M270 family of launchers. GMLRS was established as

an international cooperative program among the U.S., France, Germany, Italy and the United Kingdom. Other international customers include Japan, Bahrain, Finland, Israel, Jordan, Singapore and the United Arab Emirates.

Lockheed Martin has produced more than 30,000 GMLRS rockets at its facility in Camden. The company's Camden Operations has received more than 60 awards over the last decade, including the 2012 Malcolm Baldrige National Quality Award and the Shingo Silver Medallion Award for Operation Excellence.

LMMAR Bridge

Jun 2 - Individual Duplicate – 1st Place – Gary Bea, 2nd Place - Chuck Schmidt, and 3rd Place - Bob Vigeant.

Jun 7 - No Game

Jun 9 - No Game

Jun 14 - No Game

Jun 16 - No Game

Jun 21 – Individual Duplicate – 1st Place – (tie) Gary Bea, Chuck Schmidt, and Dave Topka.

Jun 23 - Individual Duplicate – 1st Place – (tie) Angie Schynert and Bob Vigeant; 3rd Place - (tie) Roger Abegg and Dave Himmelblau.

Jun 28 – Pairs Duplicate - 1st Place – Roger Abegg & Chuck Schmidt and 2nd Place – Himmelblau & Dave Topka.

Jun 30 – No Game

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.

Online Banking & Mobile Banking

July 20, 2016, 6:00pm -7:30pm, Blossom Hill Branch, 1090 Blossom Hill Rd., San Jose.

Description:

Online Banking - This workshop covers everything from Login Security considerations, to setting up Alerts, Electronic Statements, using Bill Pay and much more.

Mobile Banking - Covers everything you need to know to take full advantage of Star One's Mobile Banking including: How to register for Mobile Banking, Its features and functionality, the security measures we take to protect you while using these services, Mobile Deposit, & Future functionality.

Age Well, Plan Well

July 30, 2016, 9:00am -11:00am

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:

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Nancy Williamson, Estate Planning Attorney at Law, Terry Nellis, Neptune 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.

Home Buying

August 10, 2016, 6:00pm to 8:00pm, Stevens Creek Branch, 3136 Stevens Creek Boulevard, San Jose.

Description: If you are planning to buy your first home or are experienced in home buying and looking for tips, this is the event for you to attend. A real estate agent, appraiser, home inspector and title insurance company representative will all be available to provide tips and answer questions.

Using Credit Cards Wisely Solutions

August 24, 2016, 5:30pm to 7:30pm
Star One Administration Building, 1306 Bordeaux Drive, Sunnyvale.

Description: This workshop will help you manage and use credit effectively and avoid common pitfalls that can affect your ability to repay debt and/or adversely affect your credit. Key concepts in this workshop include: why using credit wisely matters, using credit to achieve financial goals, types of credit cards, how to compare credit card offers, how much debt is okay, warning signs of credit trouble, and ways out of a credit crisis.

Juno Spacecraft

DENVER, July 4, 2016 – After a five-year, 1.76-billion-mile journey, NASA's Juno spacecraft, built by Lockheed Martin (NYSE: LMT), was placed into a large, elliptical polar orbit around Jupiter this evening. The spacecraft's flight operations were controlled by a joint team at Lockheed Martin's Mission Support Area near Denver, and NASA's Jet Propulsion Laboratory (JPL) in Pasadena, California.



"Tonight, 540 million miles away, Juno performed a precisely choreographed dance at blazing speeds with the largest, most intense planet in our solar system," said Guy Beutelschies, director of Interplanetary Missions at Lockheed Martin Space Systems. "Since launch, Juno has operated exceptionally well, and the flawless orbit insertion is a testament to everyone working on Juno and their focus on getting this amazing spacecraft to its destination. NASA now has a science laboratory orbiting Jupiter."

Final commands to ready Juno for the orbit insertion were sent to the spacecraft four days ago, basically putting it into autopilot. At 9:18 p.m. MDT today, those commands fired the large main engine for a 35-minute burn that slowed the spacecraft by 1,212 mph. This allowed it to be captured by Jupi-

ter's massive gravity and placed into a large elliptical polar orbit around the planet that is initially 53 days long. In following months, the orbit will be reduced to 14 days long for science observations.

Jupiter is the solar system's largest planet, more than two-and-a-half times as massive as all of the other planets combined. Juno will conduct an in-depth study of the giant gas like no other mission before. The mission's primary goal is to improve our understanding of the formation and evolution of the planet and our solar system. Over the next 20 months, mission scientists will investigate the planet's origins, interior structure, deep atmosphere and magnetosphere.

The Juno spacecraft was launched aboard a United Launch Alliance Atlas V 551 rocket on Aug. 5, 2011 from Cape Canaveral, Florida. JPL manages the Juno mission for the principal investigator, Dr. Scott Bolton, of Southwest Research Institute in San Antonio. Juno is part of NASA's New Frontiers Program, which is managed at NASA's Marshall Space Flight Center in Huntsville, Alabama, for NASA's Science Mission Directorate. Lockheed Martin Space Systems built the spacecraft. The California Institute of Technology in Pasadena manages JPL for NASA.

Space Based Infrared System

BOULDER, Colo., July 6, 2016 – For the first time, infrared data from the Lockheed Martin-built (NYSE: LMT) Space Based Infrared System (SBIRS) will be made available for new military and civilian uses at the Air Force's recently

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opened data utilization lab in Boulder, Colorado.

While SBIRS' primary mission is strategic missile warning, the system can support a wide range of research and development projects across the field of remote sensing, which is the monitoring, observing and gathering of information on the Earth and atmosphere from space.

"SBIRS uses powerful overhead sensors that collect and transmit significant amounts of infrared data," said David Sheridan, vice president of Lockheed Martin's Overhead Persistent Infrared (OPIR) systems mission area. "By giving researchers access to this data, our objective is for them to find new, innovative uses for improving situational awareness—whether it is for tactical military missions, natural disasters or even firefighting."

In the past year, the Air Force has seen a growing demand from the military, intelligence and civil communities, as well as academia, for remote sensing capabilities. For areas like battlespace awareness, intelligence and 24/7 tactical alerts, promising solutions developed in the lab will be considered for operational applications at the SBIRS Mission Control Station, OPIR Battlespace Awareness Center at Buckley Air Force Base, Colorado.

"In an effort to develop, test and transition new or enhanced capabilities, the data utilization lab will provide an opportunity for users, data consumers and third-party developers to access these sensor feeds—providing an open

framework architecture to host new tools, algorithms and processing solutions," said Lt. Colonel Ross Johnston of the Air Force Space and Missile Systems Center.

Along with government and industry teams, academic organizations like the University of Colorado will use the data provided by the lab to facilitate collaboration and support research in areas that include monitoring the Earth's surface to determine the potential for forest fires or informing critical decisions during active fires.

"The benefit of having public-private partnerships is that we can bring together different stakeholders, in addition to doing research, and understand how we can use data from space assets to solve societal issues," said Scott Palo, associate dean for research at the University of Colorado's College of Engineering and Applied Science. "We can also provide opportunities for students, as well as small and medium-sized businesses, to connect with industry and government and develop a broader vision that we can all build upon."



A new Air Force laboratory invites developers to examine how data from SBIRS can be better applied on and off the battlefield

Sad News

Kelly McGee

Kelly W. McGee, 69 died Feb. 6, 2016. Kelly worked at Lockheed Martin in the Bay Area for 38 years.

John Knox

John D. Knox died May 27, 2016.

Joyce Wegner

Joyce Wegner died January 8, 2016.

Reported Member Deaths

Members whose deaths were reported in the last few years are listed below.

RICHARD	ARNOLD
PAUL	CONTOS
ROBERT H.	CROTSER
RAYMOND	CROZIER
JOHN E.	CUNNINGHAM
ORRIN J.	DEFERE
LA VERNE	DEVINCENZI
WILLIAM E.	FRYE
ALFRED J.	GARDNER
ART	GIORVAS
CONNIE	GREEN
JOHN W.	HAYES
MORRIS E.	ISAAK
B. KEITH	KERSEY
SHORTY	MEINZINGER
KENNETH	MIDDAUGH
DOUG	MOGLER
PAUL A. J.	PEUKER
ALI	RASHID
WILLIAM	RINEY
THOMAS	SLACK
PETER	STANEK
O. L.	TEAGUE
FRANCES E.	TURCO
FRANK J.	WEST
ROBERT J.	WHELAN
VICTOR	ZUROFF

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JULY 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 Barbeque** July 15th in Central Park, 969 Kiely Blvd, Santa Clara, CA 95051
- **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).** Lockheed Martin Retirees Investment Group (LMRIG). Meets last Thursday of each month, 1:00-3:00 p.m. Meeting place Mitchell Park Library, 3700 Middlefield Rd, Palo Alto in Midtown Room 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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