
Star Dusters Newsletter

Retirees and Former Employees of Lockheed Martin Corporation
Affiliated With Lockheed Martin Leadership Association

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Announcements — President's Corner — The Origins of Stealth Technology and Stealthy Aircraft – Why and When — Travel Opportunities — Board of Directors Christmas Luncheon Pictures — Medical and Health News — Adolph Wysocan: Engineering Pioneer of the Jet Era — In The News — In Memoriam — New Members — Coming Events — Logix

Happy New Year

2017 Membership Renewal – If you have not already done so, please send in your annual dues. The deadline for renewal of your membership has been extended to January 31, 2017. All donations will be appreciated.

If you have not received a membership renewal form by mail, please contact us at 1-888-718-5328, ext. 2011, and leave your name and address on the answering machine. A form will be sent to you ASAP and your response time will be extended to insure no lapse in receipt of the Newsletter.

Star Dusters South Coast Luncheon, February 20, 2017 – According to host and President Julius Olzer, this popular event will be at the Gemmell's Restaurant, 34471 Golden Lantern Street, Dana Point Harbor, CA 92629.

Julius is working on obtaining a speaker but no arrangements have been finalized at this time.

Deadline for reservations is February 13, 2017. (See Inserts 1A and 1B for complete details, menu, reservation form and driving instructions.)

VIEW THE NEWSLETTER AND ROSTER ON OUR WEBSITE:

<http://www.lmstardusters.org>

PRESIDENT'S CORNER**By Dennis Fernandez**

Hello Star Dusters, I hope all of you had a joyous Holiday Season and here is wishing each and everyone a very happy and healthy New Year. I look forward to serving another year as your President along with a great group of dedicated volunteers.

During the annual Star Dusters Directors, Officers and Coordinators Holiday Luncheon I had the pleasure of presenting a recognition plaque to Andy Baker for his 22 years of dedicated service to Star Dusters. The luncheon provided an opportunity to recognize the work done by all of our volunteers and was very well organized by Recording Secretary and Reunion Coordinator Susan Jones with an assist from Treasurer John Larson. Superb photographic support was provided by Tom Spanos.

As I look forward to the coming year, our Coordinators will be formulating a full slate of interesting events. We will be sure to give you timely information for these events in the Newsletter and plenty of time to sign up. We will continue to maintain a close relationship with the Lockheed Martin Corporation and the Lockheed Martin Leadership Association. Of concern to the Board of Directors in recent years has been the decline in our membership numbers. We have continued a very aggressive recruitment strategy and I am pleased to announce that new member signups for 2016 showed a steady increase over 2015 and our membership stabilized last year at over 1300 members. For our new members and for those of you who have renewed your 2017 Star Dusters membership, I thank you for your support.

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THE ORIGINS OF STEALTH TECHNOLOGY AND STEALTHY AIRCRAFT – WHY AND WHEN**By Sherm Mullin**

Lockheed and, since 1995, Lockheed Martin, have been leaders in developing low observable (stealth) technology and incorporating it in a long series of unique military aircraft. This is the first of several 2017 history articles covering these major technical accomplishments, which led to major aircraft programs, including the A-12, SR-71, HAVE BLUE, F-117, F-22, and the F-35 Lightning II fighter.

Aggressive stealth technology development was motivated by the continuing rise of capable adversary sensor systems, which greatly reduced the combat survivability of military aircraft. For over seven decades radar has been the most important sensor system. During WW II radar systems development was given very high priority in Great Britain and the US. Many systems were produced and fielded which made significant contributions to the defeat of Germany and Japan.

During the Cold War both the US and Russia endlessly developed more advanced radar systems and other sensors for use on the ground, on aircraft, on ships, and on missiles, including surface-to-air missiles, air-to-air missiles, and anti-ship missiles.. Starting in the 1950s these systems resulted in military aircraft being increasingly vulnerable and less survivable in combat.

When the U-2 was designed for the CIA in the Lockheed Skunk Works, beginning in 1954, its survivability was based on flying at very high altitude. There was no emphasis on reducing its radar cross section (its reflection of radar electromagnetic transmissions). However, after the U-2 began flying secret CIA missions over Russia, starting on July 4, 1956, it became clear that it was being detected and tracked by Russian radars. This led to a concerted Skunk Works effort to reduce the U-2 radar cross section by developing and testing a variety of experimental exterior modifications. This initiative was not successful. However, it did lead to an important basic conclusion: stealth cannot be retrofitted; it has to be designed into an aircraft from day one.

This U-2 fundamental problem initiated a Skunk Works engineering focus on reducing the effectiveness of enemy radars, by developing low observable (stealth) technology. This highly specialized technical effort has continued to the present day. It requires a mastery of the physics of electromagnetic waves and the associated mathematics. It requires special complex computer software. It requires unique testing capability. It also requires the ability to manufacture radar absorbing materials and many other stealthy components. Most important, it requires dedicated people focused on the development and manufacture of low observable technology on a sustained long term basis.

On April 21, 1958 Kelly Johnson opened a new engineering notebook and started the design of a new high altitude reconnaissance aircraft, to cruise at 90,000 feet at Mach 3. He and his Skunk Works team and his customer, the CIA, were well aware that the Russians were detecting and tracking the U-2 when it flew over Russia and were attempting to shoot it down. Kelly had decided that an aircraft much more survivable than the U-2 was essential. But that is another story; it will be covered in a future article.

The most dramatic event which made clear the impact of advances in radar systems and missiles occurred on May 1, 1960, when CIA pilot Gary Powers, flying a Skunk Works U-2 aircraft at 70,000 feet over Russia, was detected and tracked by ground radars, and then shot down by a Russian surface-to-air missile.

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Forty Years Ago: First Launch of Lockheed Trident Fleet Ballistic Missile

On January 19, 1977 the first Trident missile, developed by Lockheed Missiles and Space Company, was test launched at Kennedy Space Center in Florida. It landed in 5,600 miles to the southeast, in the Atlantic Ocean. It was being developed for the new US Navy Ohio class nuclear powered fleet ballistic missile submarines. These submarines, with Trident missiles on board, are still in operation by the U.S. Navy.

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Forty-Five Years Ago: First Flight of S-3A Viking Carrier ASW Aircraft

On January 21, 1972, at Palmdale, California, the S-3A carrier antisubmarine warfare aircraft made its first flight, flown by chief test pilot John Christiansen and Lyle Schaefer. Put under contract by the US Navy in August 1969, the S-3A aircraft program was one of the most technically and financially successful programs in Lockheed history. At the time it had the most advanced digital computer based, software

controlled avionics system in the world. A fleet of 187 aircraft was produced, with the final delivery in 1988.

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TRAVEL OPPORTUNITIES FOR STAR DUSTERS

By Ann Hyden, Travel Coordinator

Start your vacation planning early for those special trips you've been thinking about to expand your horizons! Some suggestions are listed below from our counterpart to Star Dusters in the San Francisco Bay area, LMMAR, and from Talbot Tours, which does the planning, arranging, and booking for us. Many more destinations, international and domestic, are available but too numerous to list here. I invite you to call me with your ideas, questions, etc., at (818) 367-3217. Do book early to avoid disappointment from filled-up tours. Air flights and prices can be quoted and arranged from any locale. (Note that prices herein listed include airfare from the Bay Area).

Welcome to Exciting Cuba – May 13-21, 2017 and Oct 14-22, 2017 – Be among the first American travelers in five decades to visit CUBA! Enjoy this opportunity to experience the enduring faith, colorful history, lively culture and lush tropical climate of this captivating country. After an overnight in Miami, a short flight lands you in colonial Camaguey, a city of many plazas, and visit the King Ranch, then on to Trinidad, founded in 1514 and called the colonial “Crown Jewel”, and nearby Cienfuego, the “Pearl of the South”. Before proceeding to Havana, you will pass by sugar cane and banana plantations to the Bay of Pigs and Museum. Havana holds unique architecture, many-colored buildings, cobblestone streets, taxis all '50s restorations, the home of Ernest Hemingway for thirty years of his life. You will mingle with the locals; see ballet and painters' studios; hear jazz, choir and orchestral concerts; learn the samba and rumba and about cigar-making and baseball. Prices are from \$5350 and include airfare, hotels, 22 meals, tour manager, all admissions, taxes and gratuities. Final payment is due 90 days before departure.

Grand Tour of Italy - Sept. 26-Oct. 7, 2017 – (Call for more 2017 dates) A fabulous trip awaits you covering the highlights of magnificent Italy during 12 sunny days. Fly via Boston to Florence/Montecatini and Venice for guided tours of city centers, Academia Museum (Michelangelo's David), San Marco, Doge's Palace and much more. Drive through the Chianti Hills to medieval Siena and San Gimignano, then depart for Assisi (St. Francis' Cathedral and Basilica) and on to Rome. Tour monuments and sites of both ancient and modern Rome with a day dedicated to the Vatican and Sistine Chapel. Next is Pompeii, Naples and Sorrento with tours of all, including the spectacular Amalfi Drive with views of the coastal resort Positano and another day to ferry to the enchanted Isle of Capri. Fly home from Naples. Prices include roundtrip airfare, Tour Manager, ten nights first class hotels, all breakfasts and dinners (20 meals), taxes and gratuities for double @ \$4475 each, single @ \$5230, deposit of \$400 each and insurance of \$495/536, resp. Final payment due 90 days before departure.

Briefly, for your consideration, are the following one- or two-week or less domestic travel suggestions: (Call me at 818-367-3217 for brochure/info.).

Azaleas, Plantation & Cajuns!

Mar, 9-15, 2017

Baton Rouge, Natchez, New Orleans	
Savannah & Charleston	Apr. 18-25, 2017
Rockin' Reno! Orig. Artists	Apr. 30-May 3, 2017
100 th B'Day of JFK on Cape Cod & Library	May 21-25, 2017
Hyannis, Provincetown, Nantucket	
US & Canadian Nat'l Parks- Banff, etc.	Aug 14-22, 2017
Solar Eclipse at Yellowstone	Aug 20-26, 2017
Albuquerque Balloon Fest, Santa Fe, Acoma, Taos, Carlsbad Caverns	Oct 7–Oct 14, 2017 (This is a spectacular trip)
Canyon Country Experience.	Oct 10-16, 2017
Grand Canyon, Arches, Bryce, Zion	
American Queen Paddlewheel along the Mississippi & Columbia Rivers	Various dates in 2017
Brandywine & the Poconos	Oct. 7-13, 2017
Philadelphia, Amish County	
Autumn in New England – Boston, Ludlow. Lincoln, Portland, etc.	Oct. 1-7, 2017

International trips in 2017 have been added and include:

Costa Rica	2017 dates avail.
Kenya Safari – 13 days	Mar 8-20, 2017
Spain and Portugal	Call for 2017 dates
Alpine Swiss Villages –sites seldom seen by tourists!	Aug. 21-29, 2017
Glacier Nat'l Park	June 25-July 1, 2017
Canadian's Maritimes, Bay of Fundy New Brunswick, Nova Scotia, Whales	July 18-24, 2017
Central Europe Spectacular: Prague, Black Forest, Rhine, Oberammergau	Sept 7-20, 2017

Cruise Destinations: (Call me for dates/prices/ports etc. @ [818 367-3217](tel:8183673217))

Hawaii, 8-16 day trips;	Mar 25, 2017
Alaska, sea or sea/land: 10-20 day trips;	June 11-18, 2017
Canada/New England;	Sept 23-30, 2017
Panama Canal;	Mar 15-30 & Oct 27- Nov 11, 2017
Asia 14 Days. From Singapore	Mar. 14, 2017
Enchanting Rhine –Amsterdam to Zurich River Cruise	Apr. 10-22, 2017
Romantic Danube – Prague to Budapest River Cruise	Mar. 25-Apr. 5, 2017
Barcelona to Morocco, Canary Is. Tenerife, Madeira R/T	Mar. 10-21, 2017
Eastern Caribbean fr. Galveston	Feb. 11-19, 2017
Western Caribbean fr. Ft. Lauderdale	Mar. 18-26, 2017
Asia fr. Singapore R/T – Vietnam, Cambodia, Thailand	Mar. 14-27, 2017

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2016 Board Of Directors Luncheon – December 7th, 2016
Photos By Tom Spanos



Board Luncheon at the Elks Club in Burbank, CA



Dennis Fernandez presents Andy Baker a plaque for 22 years of Star Duster service



Current Star Dusters Board of Directors



Past and present Star Dusters Presidents



Ross & Debbie Reynolds, Gerald Ruppert, Karen Ruppert, Jo Anne Pitro, Ed Pitro



Mike DeBry, Sandy Delamonte, Ed Beutler

2016 Board Of Directors Luncheon – December 7th, 2016
Photos By Tom Spanos



Laird Weaver, JoAnne Weaver



Gary Hafen, Teri Kleintop



Vic Saucedo, Mickie Saucedo



Lynne Glasgow, Ed Glasgow



Lillian Meena, Don Meena



Dennis Fernandez, Ruth Lehnhoff

2016 Board Of Directors Luncheon – December 7th, 2016
Photos By Tom Spanos



Norma Morgenfeld, Tom Morgenfeld



Ed Pitro, Jo Anne Pitro, Karen Ruppert,
Gerald Ruppert

MEDICAL AND HEALTH NEWS
Gathered by Mel Kovnat

Acknowledgment of the source of material for these excerpts is included, but no attempt was made to establish validity. Please check with your doctor or ignore the article if any information seems to conflict with advice given by your doctor.

High blood pressure (hypertension)
By Mayo Clinic Staff

Definition

High blood pressure is a common condition in which the long-term force of the blood against your artery walls is high enough that it may eventually cause health problems, such as heart disease.

Blood pressure is determined both by the amount of blood your heart pumps and the amount of resistance to blood flow in your arteries. The more blood your heart pumps and the narrower your arteries, the higher your blood pressure.

You can have high blood pressure (hypertension) for years without any symptoms. Even without symptoms, damage to blood vessels and your heart continues and can be detected. Uncontrolled high blood pressure increases your risk of serious health problems, including heart attack and stroke.

High blood pressure generally develops over many years, and it affects nearly everyone eventually. Fortunately, high blood pressure can be easily detected. And once you know you have high blood pressure, you can work with your doctor to control it.

Symptoms

Most people with high blood pressure have no signs or symptoms, even if blood pressure readings reach dangerously high levels. A few people with high blood pressure may have headaches, shortness of breath or nosebleeds, but these signs and

symptoms aren't specific and usually don't occur until high blood pressure has reached a severe or life-threatening stage.

You'll likely have your blood pressure taken as part of a routine doctor's appointment. If not, ask your doctor for a blood pressure reading at least every two years starting at age 18. If you're age 40 or older, or you're age 18-39 with a high risk of high blood pressure, ask your doctor for a blood pressure reading every year. Blood pressure generally should be checked in both arms to determine if there is a difference. It's important to use an appropriate-sized arm cuff. Your doctor will likely recommend more frequent readings if you've already been diagnosed with high blood pressure or have other risk factors for cardiovascular disease. Children age 3 and older will usually have blood pressure measured as a part of their yearly checkups.

Public blood pressure machines, such as those found in pharmacies, may provide helpful information about your blood pressure, but they may have some limitations. The accuracy of these machines depends on several factors, such as a correct cuff size and proper use of the machines. Ask your doctor for advice on using public blood pressure machines.

Causes

There are two types of high blood pressure:

Primary (essential) hypertension

For most adults, there's no identifiable cause of high blood pressure. This type of high blood pressure, called primary (essential) hypertension, tends to develop gradually over many years.

Secondary hypertension

Some people have high blood pressure caused by an underlying condition. This type of high blood pressure, called secondary hypertension, tends to appear suddenly and causes higher blood pressure than does primary hypertension. Various conditions and medications can lead to secondary hypertension, including:

-) Obstructive sleep apnea
-) Kidney problems
-) Adrenal gland tumors
-) Thyroid problems
-) Certain defects in blood vessels you're born with (congenital)
-) Certain medications, such as birth control pills, cold remedies, decongestants, over-the-counter pain relievers and some prescription drugs
-) Illegal drugs, such as cocaine and amphetamines
-) Alcohol abuse or chronic alcohol use

Risk factors

High blood pressure has many risk factors, including:

- J **Age.** The risk of high blood pressure increases as you age. Through early middle age, or about age 45, high blood pressure is more common in men. Women are more likely to develop high blood pressure after age 65.
- J **Race.** High blood pressure is particularly common among black people, often developing at an earlier age than it does in caucasian people. Serious complications, such as stroke, heart attack and kidney failure, also are more common in black people.
- J **Family history.** High blood pressure tends to run in families.
- J **Being overweight or obese.** The more you weigh the more blood you need to supply oxygen and nutrients to your tissues. As the volume of blood circulated through your blood vessels increases, so does the pressure on your artery walls.
- J **Not being physically active.** People who are inactive tend to have higher heart rates. The higher your heart rate, the harder your heart must work with each contraction and the stronger the force on your arteries. Lack of physical activity also increases the risk of being overweight.
- J **Using tobacco.** Not only does smoking or chewing tobacco immediately raise your blood pressure temporarily, but the chemicals in tobacco can damage the lining of your artery walls. This can cause your arteries to narrow, increasing your blood pressure. Secondhand smoke also can increase your blood pressure.
- J **Too much salt (sodium) in your diet.** Too much sodium in your diet can cause your body to retain fluid, which increases blood pressure.
- J **Too little potassium in your diet.** Potassium helps balance the amount of sodium in your cells. If you don't get enough potassium in your diet or retain enough potassium, you may accumulate too much sodium in your blood.
- J **Too little vitamin D in your diet.** It's uncertain if having too little vitamin D in your diet can lead to high blood pressure. Vitamin D may affect an enzyme produced by your kidneys that affects your blood pressure.
- J **Drinking too much alcohol.** Over time, heavy drinking can damage your heart. Having more than two drinks a day for men and more than one drink a day for women may affect your blood pressure.

If you drink alcohol, do so in moderation. For healthy adults, that means up to one drink a day for women of all ages and men older than age 65, and up to two drinks a day for men age 65 and younger. One drink equals 12 ounces of beer, 5 ounces of wine or 1.5 ounces of 80-proof liquor.
- J **Stress.** High levels of stress can lead to a temporary increase in blood pressure. If you try to relax by eating more, using tobacco or drinking alcohol, you may only increase problems with high blood pressure.
- J **Certain chronic conditions.** Certain chronic conditions also may increase your risk of high blood pressure, such as kidney disease, diabetes and sleep apnea.
- J Sometimes pregnancy contributes to high blood pressure, as well.

Although high blood pressure is most common in adults, children may be at risk, too. For some children, high blood pressure is caused by problems with the kidneys or heart. But for a growing number of kids, poor lifestyle habits, such as an unhealthy diet, obesity and lack of exercise, contribute to high blood pressure.

Complications

The excessive pressure on your artery walls caused by high blood pressure can damage your blood vessels, as well as organs in your body. The higher your blood pressure and the longer it goes uncontrolled, the greater the damage.

Uncontrolled high blood pressure can lead to:

- J **Heart attack or stroke.** High blood pressure can cause hardening and thickening of the arteries (atherosclerosis), which can lead to a heart attack, stroke or other complications.
- J **Aneurysm.** Increased blood pressure can cause your blood vessels to weaken and bulge, forming an aneurysm. If an aneurysm ruptures, it can be life-threatening.
- J **Heart failure.** To pump blood against the higher pressure in your vessels, your heart muscle thickens. Eventually, the thickened muscle may have a hard time pumping enough blood to meet your body's needs, which can lead to heart failure.
- J **Weakened and narrowed blood vessels in your kidneys.** This can prevent these organs from functioning normally.
- J **Thickened, narrowed or torn blood vessels in the eyes.** This can result in vision loss.
- J **Metabolic syndrome.** This syndrome is a cluster of disorders of your body's metabolism, including increased waist circumference; high triglycerides; low high-density lipoprotein (HDL) cholesterol, the "good" cholesterol; high blood pressure; and high insulin levels. These conditions make you more likely to develop diabetes, heart disease and stroke.
- J **Trouble with memory or understanding.** Uncontrolled high blood pressure may also affect your ability to think, remember and learn. Trouble with memory or understanding concepts is more common in people with high blood pressure.

Tests and diagnosis

To measure your blood pressure, your doctor or a specialist will usually place an inflatable arm cuff around your arm and measure your blood pressure using a pressure-measuring gauge.

A blood pressure reading, given in millimeters of mercury (mm Hg), has two numbers. The first, or upper, number measures the pressure in your arteries when your heart beats (systolic pressure). The second, or lower, number measures the pressure in your arteries between beats (diastolic pressure).

Blood pressure measurements fall into four general categories:

- J **Normal blood pressure.** Your blood pressure is normal if it's below 120/80 mm Hg.
- J **Prehypertension.** Prehypertension is a systolic pressure ranging from 120 to 139 mm Hg or a diastolic pressure ranging from 80 to 89 mm Hg. Prehypertension tends to get worse over time.
- J **Stage 1 hypertension.** Stage 1 hypertension is a systolic pressure ranging from 140 to 159 mm Hg or a diastolic pressure ranging from 90 to 99 mm Hg.
- J **Stage 2 hypertension.** More severe hypertension, stage 2 hypertension is a systolic pressure of 160 mm Hg or higher or a diastolic pressure of 100 mm Hg or higher.

Both numbers in a blood pressure reading are important. But after age 60, the systolic reading is even more significant. Isolated systolic hypertension is a condition in which the diastolic pressure is normal (less than 90 mm Hg) but systolic pressure is high (greater than 140 mm Hg). This is a common type of high blood pressure among people older than 60.

Your doctor will likely take two to three blood pressure readings each at three or more separate appointments before diagnosing you with high blood pressure. This is because blood pressure normally varies throughout the day, and sometimes specifically during visits to the doctor, a condition called white coat hypertension. Your blood pressure generally should be measured in both arms to determine if there is a difference. It's important to use an appropriate-sized arm cuff. Your doctor may ask you to record your blood pressure at home and at work to provide additional information.

Your doctor may suggest a 24-hour blood pressure monitoring test called ambulatory blood pressure monitoring. The device used for this test measures your blood pressure at regular intervals over a 24-hour period and provides a more accurate picture of blood pressure changes over an average day and night. However, these devices aren't available in all medical centers, and they're rarely reimbursed.

If you have any type of high blood pressure, your doctor will review your medical history and conduct a physical examination.

Your doctor may also recommend routine tests, such as a urine test (urinalysis), blood tests, a cholesterol test and an electrocardiogram — a test that measures your heart's electrical activity. Your doctor may also recommend additional tests, such as an echocardiogram, to check for more signs of heart disease.

Taking your blood pressure at home

An important way to check if your blood pressure treatment is working, or to diagnose worsening high blood pressure, is to monitor your blood pressure at home. Home blood pressure monitors are widely available and inexpensive, and you don't need a prescription to buy one. Talk to your doctor about how to get started. Home blood pressure monitoring isn't a substitute for visits to your doctor, and home blood pressure monitors may have some limitations.

Treatments and drugs

Changing your lifestyle can go a long way toward controlling high blood pressure. Your doctor may recommend you eat a healthy diet with less salt, exercise regularly, quit smoking and maintain a healthy weight. But sometimes lifestyle changes aren't enough.

In addition to diet and exercise, your doctor may recommend medication to lower your blood pressure.

Your blood pressure treatment goal depends on how healthy you are.

Blood pressure treatment goals*

*Although 120/80 mm Hg or lower is the ideal blood pressure goal, doctors are unsure if you need treatment (medications) to reach that level.

Less than 150/90 mm Hg If you're a healthy adult age 60 or older

Less than 140/90 mm Hg If you're a healthy adult younger than age 60

Less than 140/90 mm Hg If you have chronic kidney disease, diabetes or coronary artery disease or are at high risk of coronary artery disease

If you're age 60 or older, and use of medications produces lower systolic blood pressure (such as less than 140 mm Hg), your medications won't need to be changed unless they cause negative effects to your health or quality of life.

Also, people older than 60 commonly have isolated systolic hypertension — when diastolic pressure is normal but systolic pressure is high.

The category of medication your doctor prescribes depends on your blood pressure measurements and your other medical problems.

Medications to treat high blood pressure

) **Thiazide diuretics.** Diuretics, sometimes called water pills, are medications that act on your kidneys to help your body eliminate sodium and water, reducing blood volume.

Thiazide diuretics are often the first, but not the only, choice in high blood pressure medications. Thiazide diuretics include hydrochlorothiazide (Microzide), chlorthalidone and others.

If you're not taking a diuretic and your blood pressure remains high, talk to your doctor about adding one or replacing a drug you currently take with a diuretic. Diuretics or calcium channel blockers may work better for black and older people than do angiotensin-converting enzyme (ACE) inhibitors alone. A common side effect of diuretics is increased urination.

-) **Beta blockers.** These medications reduce the workload on your heart and open your blood vessels, causing your heart to beat slower and with less force. Beta blockers include acebutolol (Sectral), atenolol (Tenormin) and others.
- When prescribed alone, beta blockers don't work as well, especially in black and older people, but may be effective when combined with other blood pressure medications.
-) **Angiotensin-converting enzyme (ACE) inhibitors.** These medications — such as lisinopril (Zestril), benazepril (Lotensin), captopril (Capoten) and others — help relax blood vessels by blocking the formation of a natural chemical that narrows blood vessels. People with chronic kidney disease may benefit from having an ACE inhibitor as one of their medications.
-) **Angiotensin II receptor blockers (ARBs).** These medications help relax blood vessels by blocking the action, not the formation, of a natural chemical that narrows blood vessels. ARBs include candesartan (Atacand), losartan (Cozaar) and others. People with chronic kidney disease may benefit from having an ARB as one of their medications.
-) **Calcium channel blockers.** These medications — including amlodipine (Norvasc), diltiazem (Cardizem, Tiazac, others) and others — help relax the muscles of your blood vessels. Some slow your heart rate. Calcium channel blockers may work better for black and older people than do ACE inhibitors alone.
- Grapefruit juice interacts with some calcium channel blockers, increasing blood levels of the medication and putting you at higher risk of side effects. Talk to your doctor or pharmacist if you're concerned about interactions.
-) **Renin inhibitors.** Aliskiren (Tekturna) slows down the production of renin, an enzyme produced by your kidneys that starts a chain of chemical steps that increases blood pressure.
- Tekturna works by reducing the ability of renin to begin this process. Due to a risk of serious complications, including stroke, you shouldn't take aliskiren with ACE inhibitors or ARBs.

Additional medications sometimes used to treat high blood pressure

If you're having trouble reaching your blood pressure goal with combinations of the above medications, your doctor may prescribe:

-) **Alpha blockers.** These medications reduce nerve impulses to blood vessels, reducing the effects of natural chemicals that narrow blood vessels. Alpha blockers include doxazosin (Cardura), prazosin (Minipress) and others.
-) **Alpha-beta blockers.** In addition to reducing nerve impulses to blood vessels, alpha-beta blockers slow the heartbeat to reduce the amount of blood that must be pumped through the vessels. Alpha-beta blockers include carvedilol (Coreg) and labetalol (Trandate).

- J) **Central-acting agents.** These medications prevent your brain from signaling your nervous system to increase your heart rate and narrow your blood vessels. Examples include clonidine (Catapres, Kapvay), guanfacine (Intuniv, Tenex) and methyl dopa.
- J) **Vasodilators.** These medications, including hydralazine and minoxidil, work directly on the muscles in the walls of your arteries, preventing the muscles from tightening and your arteries from narrowing.
- J) **Aldosterone antagonists.** Examples are spironolactone (Aldactone) and eplerenone (Inspra). These drugs block the effect of a natural chemical that can lead to salt and fluid retention, which can contribute to high blood pressure.

To reduce the number of daily medication doses you need, your doctor may prescribe a combination of low-dose medications rather than larger doses of one single drug. In fact, two or more blood pressure drugs often are more effective than one. Sometimes finding the most effective medication or combination of drugs is a matter of trial and error.

Lifestyle changes to treat high blood pressure

No matter what medications your doctor prescribes to treat your high blood pressure, you'll need to make lifestyle changes to lower your blood pressure.

Your doctor may recommend several lifestyle changes, including:

- J) Eating a healthier diet with less salt (the Dietary Approaches to Stop Hypertension, or DASH, diet)
- J) Exercising regularly
- J) Quitting smoking
- J) Limiting the amount of alcohol you drink
- J) Maintaining a healthy weight or losing weight if you're overweight or obese

Resistant hypertension: When your blood pressure is difficult to control

If your blood pressure remains stubbornly high despite taking at least three different types of high blood pressure drugs, one of which usually should be a diuretic, you may have resistant hypertension. People who have controlled high blood pressure but are taking four different types of medications at the same time to achieve that control also are considered to have resistant hypertension. The possibility of a secondary cause of the high blood pressure generally should be reconsidered.

Having resistant hypertension doesn't mean your blood pressure will never get lower. In fact, if you and your doctor can identify what's behind your persistently high blood pressure, there's a good chance you can meet your goal with the help of treatment that's more effective.

Your doctor or hypertension specialist can evaluate whether the medications and doses you're taking for your high blood pressure are appropriate. You may have to fine-tune your medications to come up with the most effective combination and doses. Adding an

aldosterone antagonist such as spironolactone (Aldactone) often leads to control of resistant hypertension. Some experimental therapies such as catheter-based radiofrequency ablation of renal sympathetic nerves (renal denervation) and electrical stimulation of carotid sinus baroreceptors are being studied.

In addition, you and your doctor can review medications you're taking for other conditions. Some medications, foods or supplements can worsen high blood pressure or prevent your high blood pressure medications from working effectively. Be open and honest with your doctor about all the medications or supplements you take.

If you don't take your high blood pressure medications exactly as directed, your blood pressure can pay the price. If you skip doses because you can't afford the medications, because you have side effects or because you simply forget to take your medications, talk to your doctor about solutions. Don't change your treatment without your doctor's guidance.

Lifestyle and home remedies

Lifestyle changes can help you control and prevent high blood pressure, even if you're taking blood pressure medication. Here's what you can do:

- J) **Eat healthy foods.** Eat a healthy diet. Try the Dietary Approaches to Stop Hypertension (DASH) diet, which emphasizes fruits, vegetables, whole grains, poultry, fish and low-fat dairy foods. Get plenty of potassium, which can help prevent and control high blood pressure. Eat less saturated fat and trans fat.
- J) **Decrease the salt in your diet.** A lower sodium level — 1,500 milligrams (mg) a day — is appropriate for people 51 years of age or older, and individuals of any age who are black or who have hypertension, diabetes or chronic kidney disease.

Otherwise healthy people can aim for 2,300 mg a day or less. While you can reduce the amount of salt you eat by putting down the saltshaker, you generally should also pay attention to the amount of salt that's in the processed foods you eat, such as canned soups or frozen dinners.

- J) **Maintain a healthy weight.** Keeping a healthy weight, or losing weight if you're overweight or obese, can help you control your high blood pressure and lower your risk of related health problems. If you're overweight, losing even 5 pounds (2.3 kilograms) can lower your blood pressure.
- J) **Increase physical activity.** Regular physical activity can help lower your blood pressure, manage stress, reduce your risk of several health problems and keep your weight under control.

For most healthy adults, the Department of Health and Human Services recommends that you get at least 150 minutes a week of moderate aerobic activity or 75 minutes a week of vigorous aerobic activity, or a combination of moderate and vigorous activity. Aim to do muscle-strengthening exercises at least two days a week.

- J) **Limit alcohol.** Even if you're healthy, alcohol can raise your blood pressure. If you choose to drink alcohol, do so in moderation. For healthy adults, that means up to

one drink a day for women of all ages and men older than age 65, and up to two drinks a day for men age 65 and younger. One drink equals 12 ounces of beer, 5 ounces of wine or 1.5 ounces of 80-proof liquor.

- J **Don't smoke.** Tobacco injures blood vessel walls and speeds up the process of hardening of the arteries. If you smoke, ask your doctor to help you quit.
- J **Manage stress.** Reduce stress as much as possible. Practice healthy coping techniques, such as muscle relaxation, deep breathing or meditation. Getting regular physical activity and plenty of sleep can help, too.
- J **Monitor your blood pressure at home.** Home blood pressure monitoring can help you keep closer tabs on your blood pressure, show if medication is working, and even alert you and your doctor to potential complications. Home blood pressure monitoring isn't a substitute for visits to your doctor, and home blood pressure monitors may have some limitations. Even if you get normal readings, don't stop or change your medications or alter your diet without talking to your doctor first.

If your blood pressure is under control, you may be able to make fewer visits to your doctor if you monitor your blood pressure at home.
- J **Practice relaxation or slow, deep breathing.** Practice taking deep, slow breaths to help relax. There are some devices available that promote slow, deep breathing. However, it's questionable whether these devices have a significant effect on lowering your blood pressure.
- J **Control blood pressure during pregnancy.** If you're a woman with high blood pressure, discuss with your doctor how to control your blood pressure during pregnancy.

Alternative medicine

Although diet and exercise are the most appropriate tactics to lower your blood pressure, some supplements also may help lower it. However, more research is needed to determine the potential benefits. These include:

- J Fiber, such as blond psyllium and wheat bran
- J Minerals, such as magnesium, calcium and potassium
- J Folic acid
- J Supplements or products that increase nitric oxide or widen blood vessels (vasodilators), such as cocoa, coenzyme Q10, L-arginine or garlic
- J Omega-3 fatty acids, found in fatty fish, fish oil supplements or flaxseed

While it's best to include these supplements in your diet as foods, you can also take supplement pills or capsules. Talk to your doctor before adding any of these supplements to your blood pressure treatment. Some supplements can interact with medications, causing harmful side effects, such as an increased bleeding risk that could be fatal. You can also practice relaxation techniques, such as deep breathing or meditation, to help you relax and reduce your stress level. These practices may temporarily reduce your blood pressure.

~end~

ADOLPH WYSOCAN – ENGINEERING PIONEER OF THE JET ERA**By David J. Vaughan, Airport Journals 5/8/2015**

Pan American founder Juan Tripp, and legendary American Airlines president C.R. Smith may not be household names, but their accomplishments enshrined them as pioneers in aviation and business circles. But, what do we know of individuals who did not share in the publicity bestowed upon pilots, astronauts and airline founders, such as the engineers who designed and supervised the construction of historic aircraft?

Recently, Adolph Wysocan visited the Scottsdale Business Aircraft & Jet Preview, and participated in the development of the world's first jet aircraft, in Germany, in the World War II era. His career eventually spanned both sides of the Atlantic.

Wysocan was born in Vienna in 1921. He graduated with degrees in mechanical and electrical engineering from the Vienna Technical College in 1939. Late in 1939, the Heinkel Aircraft Company in Rostock, Germany employed him. He assisted in designing and installing the avionics systems for the prototype of the Heinkel 280, a twin-engine jet fighter, which was competing with the Messerschmitt Aircraft Company's ME 262 to become the world's first jet-powered aircraft.

Because the engine wasn't yet ready, "The decision was made to make engine-less gliding trials to evaluate handling and flying characteristics," he said. "A Heinkel 111 would climb to about 10,000 feet with the HE 280 in tow, and the 280 would glide back to the ground. The first powered flight was eventually made on April 2, 1941."

Due to heavy icing, a test pilot was forced to use the ejector seat, which the design engineers had wisely incorporated, making it the first emergency evacuation of its kind.

"The 280, with its top speed of 512 mph—much faster than anything the allies had—and a service ceiling of 38,000 feet, was superior to the ME 262 in many ways," he said. "For one thing, the ME 262 was built with a conventional tail wheel, which handicapped its acceleration on takeoff because the engine thrust was projected largely downward instead of aft. The HE 280 was built with a tri-cycle landing gear, from the onset, to address this thrust problem. Because our HE 280 was superior, we were awarded an order by the German Air Ministry to immediately produce 300 HE 280 aircraft for the Luftwaffe.

"Unfortunately, being a small company with limited manpower and production capabilities, it would've been impossible for us to meet the terms of such a large contract. Thus, it was a great disappointment to all of us at Heinkel when the contract was then transferred to the larger Messerschmitt Company for its unproven ME 262. We suspected that politics also played a role in our losing the contract because Mr. Messerschmitt was very friendly with General Milch, the Luftwaffe contract officer."

In 1942, he was assigned to the production staff of the HE 219, a twin-engine piston night fighter. Recognized as a qualified aeronautical engineer, he was given sole responsibility for the design and installation of radar on the HE 219.

"Radar then was very crude by today's standards," he said. "It could give a bearing fairly accurately, but it had a maximum range of only about four kilometers, or two and

a half miles, and the bearing and range were displayed on two separate scopes. Ours was probably as good as any existing in the world at that time.”

Wysocan said that beginning with the HE 219 in 1942, until the fall of 1944, he flew as a design and test engineer on several different Luftwaffe airplanes.

“They included the Heinkel 111, Messerschmitt 110, the ME 120, and I even made a few flights in the Junker 88,” he said. “As much of my work at that time required me to participate in test flights, I would often occupy a pilot’s seat and occasionally be allowed to fly the airplane.”

“During that time, you might say I experienced both bad and good times,” he said. “By the fall of 1944, Germany ceased virtually all airplane production because of a critical shortage of raw materials, fuel and pilots. This meant there was little or no work for engineers. Thus, my exemption from military service I had before and during the war to that point, because I was classified as an essential civilian engineer, was withdrawn.”

He said he soon found himself with a rifle in the “Wehrmacht”—the German army. “It wasn’t long, maybe two months, and I was captured and sent to a U.S. prisoner-of-war camp in France,” he said.

Because Wysocan learned English while in high school, he was selected to be an interpreter in the POW camp, making his interment much easier. After 16 months as a POW, he was released in March 1946 and returned to his native Austria. As no aircraft manufacturing opportunities were available, he got a job with Pan American Airways in Vienna overseeing airplane maintenance. Later, a dispatcher and then the manager of the Vienna airport in 1952.

In 1955, the Korean War created a shortage of aeronautical engineers in the U.S. and Lockheed Aircraft Company’s chief engineer, Walt Jones, went to Europe in search of qualified engineers. “Walt Jones interviewed me and offered me a position as a senior engineer at Lockheed in Burbank, Calif. After going through immigration, with Lockheed’s help, I came to the U.S. in November 1955.”

He became a department manager for the Data Acquisition and Data Analysis flight test organization. Beginning with Lockheed’s flagship, the Constellation, his flight test responsibilities eventually included the Electra, Navy P2V and P3, the L-1011 Tri Star and the Cheyenne-56. He participated in test flights, working with well known Lockheed test pilots Tony LeVier and Herman “Fish” Salmon, while adding nearly 500 hours to his test engineer flight time. He retired in 1987 after 32 years at Lockheed.

Wysocan was bit by the flying bug while working with the Heinkel Aircraft Company in Germany, but it was many years later when he became a licensed pilot as a member of Lockheed’s employee flying club. He obtained his commercial single and multi-engine certificates, instrument rating and a private helicopter license. He logged over 3,500 hours flying his airplanes throughout North and South America. He ferried a Beech Baron from Los Angeles to Salzburg, Austria, via Newfoundland, the Azores and Lisbon.

Adolph Wysocan, a name you will not find in record or aviation history books, proudly represents the thousands of dedicated engineers who, from Kitty Hawk to modern space shuttles, have silently pioneered and sustained an industry.

IN THE NEWS

By Pete Harrigan

NON-PRODUCT RELATED

After Meeting with CEOs, Trump Invites F-35 vs. F-18 Dogfight – After meeting with the chief executives of the nation’s two largest defense contractors, President-elect Trump stepped up his pressure on the sector by suggesting he could use Boeing’s F/A-18 as a substitute for Lockheed Martin’s F-35, the *Wall Street Journal* reported. Trump met separately on December 21 with Boeing’s Dennis Muilenburg and Lockheed Martin’s Marillyn Hewson after slamming the cost of the F-35 and threatening to cancel the new Air Force One, under development by Boeing. The next day, Trump tweeted: “Based on the tremendous cost and cost overruns of the Lockheed Martin F-35, I have asked Boeing to price-out a comparable F/A-18 Super Hornet!” Experts noted that the president can’t unilaterally award government contracts and pointed out that the two aircraft serve very different roles. Boeing declined to comment on whether Trump had raised his request about the F/A-18 at his meeting with Muilenburg, but said it is “committed to working with the president-elect and his administration to provide the best capability, deliverability and affordability across all Boeing products and services to meet our national security needs.” Lockheed Martin declined to comment.

Trump Attacks Foreshadow War on Defense Industry – Aides said President-elect Trump intends to keep pushing to cut the costs of military hardware, *Reuters* reported. Trump criticized the F-35’s cost and threatened to cancel the new Air Force One, though Senate Armed Services Committee Chair John McCain (R-AZ) noted that the president can’t unilaterally scrap a contract. Referring to the F-35, McCain said: “He can reduce the buy over time, next year, as we look at it again.” Unwinding such a large program, involving contractors in nearly every state and eight partner nations, is unlikely, Baird Equity Research analyst Peter Arment said. “But what is likely ... is the message to the industry of potentially more risk-sharing on costs. This is potentially a new paradigm for the industry.” Trump transition spokesman Jason Miller said scrutiny of contracts will continue. “I would expect this to be wide-reaching and impact all of government as we look to come up with better deals,” he said. “Some of these deals that have been in place, we’re going to look for opportunities to go back through and make sure that we’re not getting taken advantage of.”

Hewson Calls for Stable Defense Spending – Lockheed Martin executives told members of President-elect Trump’s transition team that stable defense budgets should be a priority of the new administration, *National Defense* reported. “It’s important for industry and for our customers to have rational, stable budgets,” Chairman, President and CEO Marillyn Hewson said during a panel discussion at the fourth annual Reagan National Defense Forum in California. “We would like to see spending aligned with a national security strategy,” she added, while also calling for less procurement red tape and more advocacy for defense exports. She was among a number of defense officials and industry executives to speak at the daylong conference, focused on the issues and national security environment the Trump administration will face.

Hewson Says Trump's Position on NATO Isn't New – President-elect Trump was met with skepticism when he suggested NATO allies should shoulder more of the collective global security burden and rely less on the U.S., but Lockheed Martin Chairman, President and CEO Marillyn Hewson said that's a message that's been heard before, the *Washington Business Journal* reported. "Relative to a recognition that countries should support their own defense capabilities and capacity, I don't think that's a new message," Hewson said at an investor conference in Palm Beach, FL. She noted that, at NATO's 2016 summit in Warsaw, allies expressed a strong desire to bring defense spending levels to 2% of their gross domestic product. "As they do that I think there are opportunities for Lockheed Martin to continue to sell products and services to them to build up their defense capability," Hewson said. She added that Lockheed Martin is "working with the transition team" and will "look forward to working with the new administration" on defense spending.

Lockheed Martin Denies Link to South Korea Political Scandal – The company denied allegations it was aided by Choi Soon-sil, the scandal-linked confidant of impeached South Korean President Park Geun-hye, *The Korea Times* reported. Lockheed Martin dismissed as "false" reports claiming it had worked with Choi or others on behalf of programs including the Terminal High Altitude Area Defense (THAAD) system and the F-35. "Lockheed Martin would like to clarify that our Chairman, President and CEO Ms. Marillyn Hewson has never visited Korea and has never met with Choi Soon-sil," the company said. The statement came after a member of the main opposition Democratic Party of Korea claimed Choi met with Hewson in June. In addition to denying any wrongdoing, the company stressed that THAAD deployment in South Korea was a "government decision." Park's downfall was triggered by prosecutors' accusations that she shared confidential documents with a longtime friend and helped her extract money from business groups including the Samsung and Hyundai conglomerates.

Lockheed Martin Gets Extension for Job-Related Incentives – Brevard County commissioners approved an extension to the deadline for Lockheed Martin to earn a \$1.75 million economic incentive package tied to job creation on Florida's Space Coast, *Florida Today* reported. Under a deal finalized in April 2016, the company would get up to \$1.75 million in return for creating up to 300 jobs paying an average of \$89,000 a year, with 25 of those jobs added by the end of 2016. But the company never said how those jobs would be created, and subsequently requested a two-year extension when it became clear the deadline wouldn't be met. Only one commissioner opposed the extension, describing the incentives as "corporate welfare".

Boeing CEO Succeeds Hewson as AIA Chair – The Aerospace Industries Association (AIA) elected Boeing Chairman, President and CEO Dennis A. Muilenburg to serve as 2017 Chairman of the organization's Board of Governors. Muilenburg succeeds Lockheed Martin Chairman, President and CEO Marillyn Hewson, who remains on the Board of Governors. Raytheon Chairman and CEO Thomas A. Kennedy will serve as 2017 Vice Chairman. AIA advocates for policies and funding in support of the nation's aerospace and defense industry.

Retired Lockheed Martin Exec Named to Textron Board – Textron Inc. named Ralph Heath to its board of directors, the *Wichita Business Journal* reported. Heath retired in 2012 as executive vice president of Lockheed Martin's aeronautics business, following a 37-year career. Heath was on the board of directors of Hawker Beechcraft from 2013 to 2014 prior to its acquisition by Textron.

Generation Space Program Graduates 1st Group of UAE Students – The first group of young professionals graduated from a training program intended to boost the United Arab Emirates' space industry, *The National* reported. The Generation Space initiative offers coursework, professional development and mentoring in the UAE and the United States. It was launched last year by the UAE Space Agency, Mubadala and Lockheed Martin. The four-month program includes 350 hours of practical training and coursework, with visits to UAE's space industry centers and the Kennedy Space Center in Florida. Dr. Khalifa Al Romaiti, UAE Space Agency chair, said the program aligns with the agency's goal to support and develop a generation of engineers and scientists. Robert Harward, Lockheed Martin UAE CEO, said the company "is proud of our partnership to train and inspire the UAE space explorers of tomorrow, and we look forward to watching the next generation accomplish great things for their country and for the industry."

Fort Worth Employees Donate Over \$200K in Cash, Gifts – Employees at Lockheed Martin's plant in Fort Worth, TX, donated more than \$200,000 in cash and gifts to brighten the holidays for those less fortunate, the *Star-Telegram* reported. The contributions were distributed to several local charities during the company's Holiday Charities Parade, held in the huge plant where the F-16 and F-35 are built. Youngsters from a local center for children with developmental or behavioral disabilities selected bicycles and then rode through the plant, accompanied by a high school marching band and a Marine Corps color guard. The annual event is a favorite of Executive Vice President Orlando Carvalho, who thought for a couple of seconds when asked what he felt while watching the bike parade. "Pride," he answered. "I'm so proud of the men and women who work for our company and what they do to give back to the community."

ENERGY & TECHNOLOGY INITIATIVES

Lockheed Martin Loses Sandia Contract – The National Nuclear Security Administration (NNSA) selected National Technology and Engineering Solutions of Sandia (NTESS) to operate Sandia National Laboratories, ending a 23-year run by Lockheed Martin, the *Albuquerque Journal* reported. NTESS, a subsidiary of Honeywell International, is supported by Northrop Grumman and Universities Research Association. The award is valued at \$2.6 billion annually over 10 years, if all options are exercised. Lockheed Martin's contract expires on April 30, 2017, allowing for a four-month transition period. With more than 10,500 employees, Sandia maintains U.S. nuclear weapons and performs work for the Department of Defense and U.S. intelligence agencies. Lockheed Martin was one of 19 bidders for the new Sandia contract. An NNSA spokesman said Honeywell's proposal represented the best value "based on the collective mix of strengths and weaknesses identified" among the bids. A Lockheed Martin spokesman said the company was disappointed by NNSA's decision but would aim for a smooth management transition.

Company Takes Stake in Chip Designer – Lockheed Martin is investing in a chip designer and targeting military communications and technology for the next generation of cellphones as part of the revamp of its venture capital arm, the *Wall Street Journal* reported. The company acquired a minority stake in San Diego-based IQ-Analog Corp., its first investment since starting a \$100 million fund in the summer. With the Pentagon scouting for technology that can be repurposed for military use, Lockheed Martin said it wants to groom young firms that could become potential suppliers or even acquisition targets. Chris Moran, who was hired in the summer as general manager of Lockheed Martin Ventures, said he is looking at more than 100 firms. Lockheed Martin's Rotary and Mission Systems business unit, which handles the bulk of its semiconductor work, spent a year preparing for the investment. Financial terms of the IQ-Analog investment weren't disclosed.

Lockheed Martin, Virginia Tech Sign Collaboration Agreement – The new agreement will allow for increased collaboration, and more recruiting and technical engagement between the two entities, the *Roanoke Times* reported. Under an earlier agreement, Lockheed Martin has established several scholarships at Virginia Tech, sponsored student teams in engineering competitions, provided internships for more than 100 students and hired more than 80 grads. The company and the university also have partnered on projects related to electrical and computer engineering, wireless communications, cognition and signal processing. Terms of the new agreement weren't disclosed.

AERONAUTICS

USAF Says F-35 Overruns Are in the Past – The U.S. Air Force general in charge of the F-35 program disputed President-elect Trump's contention that costs are out of control, saying the days of price and schedule overruns in development of the new fighter jet largely ended in 2011, the *Wall Street Journal* reported. "The program is not out of control," Lt. Gen. Chris Bogdan said, adding that he hoped to talk to the new administration, lay out the facts and let them make their own judgment on whether previous corrections were effective. Lockheed Martin and its suppliers already are investing to reduce production costs, and Bogdan said more competition between suppliers and multiyear purchases of the plane to generate economies of scale were two avenues to explore further. The Trump transition team didn't immediately respond to requests for comment.

Pentagon Provides \$1.3B Advance for F-35 Production – Lockheed Martin received a \$1.28 billion advance from the Pentagon to continue F-35 production while negotiations continue on a contract valued as much as \$7.19 billion for 90 aircraft, *Bloomberg News* reported. "With a complex production line and a dynamic supply chain, it was important to obligate funds" using the down payment process to prevent major delays, said Joe DellaVedova, spokesman for the Pentagon's F-35 program office. He added that officials "are confident" the Lot 10 production contract will be agreed to "over the next few months." That would be a change from the Lot 9 contract, which the Pentagon unilaterally imposed after talks with Lockheed Martin dragged on. Both parties were close to agreement before the company rejected the Pentagon's

“best and final offer,” according to industry and government officials familiar with the ninth contract.

Pentagon Arms Buyer “Hopeful” F-35 Block Buy Will Proceed – Frank Kendall, the Pentagon’s chief arms buyer, is hopeful that a proposed three-year block buy of F-35 fighter jets will proceed as planned, *Reuters* reported. The block buy would include more than 400 aircraft for the U.S. military and international customers. Kendall said defense officials had debated postponing or scrapping the block buy until after operational testing and evaluation had been completed, a course advocated by the Pentagon’s chief weapons tester. Scrapping the block buy, which covers fiscal years 2018 through 2020, would have been another blow to the F-35 program, and allies counting on the deal to lower production costs.

Pentagon Provided Misleading Info on F-35, Test Chief Says – Pentagon officials have projected a misleading assessment of progress on the F-35 program, *Bloomberg News* reported. “If not changed, the existing responses would at best be considered misleading and at worst, prevarications,” Michael Gilmore, director of operational test and evaluation, wrote in an internal memo criticizing the draft response to questions about F-35 testing from Senate Armed Services Committee Chair John McCain (R-AZ). The memo is the latest example of Gilmore’s vocal doubts about the F-35, critiques that are at odds with the Pentagon’s narrative that the program is on course after earlier problems. Spokesmen for Deputy Defense Secretary Robert Work and Pentagon acquisition chief Frank Kendall said they were aware of Gilmore’s concerns and that the tester’s input “was and continues to be used to help senior leaders make informed decisions.”

Loose Bracket Sparked USMC F-35 Fire – The fire that broke out on a U.S. Marine Corps F-35B during a training flight in October was caused by a loose bracket in the weapons bay, *Defense News* reported. U.S. Air Force Lt. Gen. Christopher Bogdan, the Pentagon’s F-35 program chief, said the loose bracket triggered sparking in electrical wiring adjacent to hydraulic lines and other flammable materials. “We knew about this problem long before that [incident], and all of our airplanes were being retrofitted with a new bracket,” Bogdan said. The F-35B pilot was able to land the aircraft safely and wasn’t injured. The incident was the F-35B’s first Class A mishap, which involve loss of life or damage of more than \$2 million.

USN Considers More F/A-18s to Offset F-35 Delays – The U.S. Navy is considering buying more Boeing F/A-18 Super Hornets to make up for a shortfall of carrier-based jets due to delays with Lockheed Martin’s F-35s and long maintenance times for older model Hornets, *Reuters* reported. The plan, which is still being finalized, could be implemented as part of the fiscal 2018 budget, a service official said. Sources familiar with Navy plans said delays in the fielding of the F-35’s carrier variant, longer-than-expected maintenance times for older model Hornets, and higher usage rates have left the service facing a shortfall of about 70 fighter jets in coming years. If implemented, the plan would provide dozens of new orders for Boeing and keep its St. Louis production line running for several more years.

F-35 Test Aircraft Need Service Life Extension – The F-35 hasn't flown a combat mission yet, but its taxed developmental aircraft need a service life extension, *FlightGlobal* reported. The Pentagon announced its intention to award Lockheed Martin a sole source contract to examine the airframe, hardware, software and structure of test aircraft, and to bring them up to the latest configuration. Through October, individual test aircraft had flown between 314 and 1,200 hours, well below their service life of 8,000 hours. But upgrades are necessary because some of the flight operations were at the extreme ends of design limits so necessary flight test data could be gathered, a Pentagon spokesman said. The value of the proposed service life extension program wasn't disclosed.

F-35 JPO Gets a Reprieve – The compromise version of the 2017 National Defense Authorization Act protects the F-35 Joint Program Office (JPO) from elimination, but requires the Pentagon to report on alternatives for the management of the joint strike fighter by the end of March, *Defense News* reported. Senate Armed Services Committee Chair John McCain (R-AZ) previously sought to disband the JPO after the F-35 reaches full-rate production in April 2019, transferring control to the military services. The compromise keeps the JPO in place but asks the Pentagon how it could be wound-down in the coming years.

First F-35s Built Outside of U.S. Operational in Italy – Italy took delivery of two F-35 jets at its Amendola Air Base, the first joint strike fighters built outside the United States to become operational, *Defense News* reported. The jets were flown to Amendola, in southern Italy, from Italy's F-35 final assembly and maintenance line in Cameri, in northern Italy. Italy has to date rolled out six F-35s at Cameri, with the first four flying to Luke Air Force Base in Arizona to take part in pilot training. Italy is expected to procure 90 F-35s; it committed to building a final assembly line in the hope it will turn into a profitable maintenance hub.

Israel's First F-35s Arrive – Israel's first two F-35s arrived at Nevatim Air Force Base, near Be'er Sheva, after a flight that was delayed due to poor weather conditions, *Haaretz* reported. Among those witnessing the arrival were U.S. Defense Secretary Ashton Carter, Prime Minister Benjamin Netanyahu, Israel Defense Force brass and officials from Lockheed Martin. Netanyahu said Israel's military strength is receiving a highly significant boost with the addition of the F-35s to the Israel Air Force arsenal. "Our long arm has now become longer and mightier," he stated. Carter told the audience that the F-35s were critical to maintaining Israel's military edge in the region.

U.S. Reps Remain in Israel to Support F-35s – About 30 Lockheed Martin specialists and three U.S. Air Force representatives will remain in Israel indefinitely to help the Israel Air Force (IAF) operate and maintain its new F-35s, *Defense News* reported. While USAF personnel are expected to return to home bases in about six months, many of the Lockheed Martin employees will remain at IAF's Nevatim base in the Negev desert years after the service declares initial operational capability, expected by the end of 2017. A Lockheed Martin spokesman noted that the highly computerized, sensor-fused, fifth-generation aircraft comes with a steep learning curve at the beginning of its operational life, given all the data that must be tracked before, during and following flight. Even after the IAF masters logistical and operational procedures,

the spokesman said company personnel will be present to assist Israel and other F-35 partner and customer nations as new software updates come online.

Israel to Acquire 17 More F-35s – Israel approved the purchase of another 17 F-35 fighters, boosting its stealth force to 50 aircraft, *Defense News* reported. Prime Minister Benjamin Netanyahu's office did not disclose the deal's cost, but defense and industry sources said it will exceed \$2.5 billion, including support equipment. The U.S. government has approved Israel for the purchase of up to 75 F-35s. Israel initially ordered 19 aircraft in 2010 under a \$2.7 billion package. That was followed by a \$2.82 billion order in February 2015 for another 14 planes.

Lockheed Martin Offers F-35 in Finland Competition – Finland received information from five aircraft primes regarding the replacement of its air force's Boeing F/A-18C/D fleet, *FlightGlobal* reported. Boeing, Dassault, Eurofighter, Lockheed Martin and Saab responded to a solicitation with information, respectively, on the F/A-18E/F, Rafale, Typhoon, F-35 and Gripen E aircraft. The government is expected to issue a formal request for proposals in April 2017, once the initial submissions are analyzed. A subsequent request for proposals is expected to be issued in 2018, and the government has indicated that a selection for the estimated \$10.5 billion program will be made in 2021. *Defense News* reported that the Finnish government is expected to give priority to bids that contain a strong degree of long-term domestic industrial participation, to stimulate domestic growth and jobs. Finland currently operates 61 F/A-18s, which it plans to phase out by 2025.

Boeing Met Frequently with Canadian Officials Ahead of F-18 Buy – Boeing, tapped by Canada to provide 18 F/A-18s to the air force, met with government officials roughly seven times more often than representatives from rival F-35 maker Lockheed Martin, *CBC News* reported. The federal lobbyist registry revealed that Boeing representatives met 23 times with officials from the Defence, Industry, Public Services and Procurement departments, and even with senior staff in Prime Minister Justin Trudeau's office. Lockheed Martin had only three meetings. The discrepancy raises questions about how level the playing field was ahead of the Trudeau administration's decision to scrap an F-35 contract and buy the F-18s ahead of a new fighter competition set to begin next year.

Critics Question Canada's Fighter Jet Plans – Political critics say the Canadian government's proposal to buy 18 F/A-18s as a stopgap measure before proceeding to a full competition for a new fighter jet is not only a waste of time and money but illegal, *Defense News* reported. Defence Minister Harjit Sajjan justified the move as necessary because a capability gap had emerged with the current fleet of CF-18 fighters. But when Lt. Gen. Michael Hood, the commander of the Royal Canadian Air Force, testified in April before the Commons defence committee, he didn't mention a gap and instead he told lawmakers the CF-18s could continue operating until 2025 or beyond. James Bezan, the defense critic for the Conservative Party, said the capability gap issue was concocted to support the sole-source purchase of the F/A-18s.

Canada, Though Cool to F-35, Says It's Still an Option – Canada will consider Lockheed Martin's F-35 in an open competition for fighter jets, despite domestic and

foreign criticism about the program's cost, *Reuters* reported. Canada's ruling Liberals came to power in 2015 on a promise not to buy F-35s because the planes were too expensive. But the party has since softened its position and said that all suppliers could bid to replace its aging fighter CF-18 jet fleet. "It's an open and transparent competition we're going to be engaged in and the various aircraft and aircraft producers will have an opportunity to make their best case," Prime Minister Justin Trudeau told a news conference when asked whether Canada might be more likely to opt for the F-35 if the costs fell.

As Trump Pushes Domestic Jobs, U.S. Plans to Build Jets in India – As a new president bent on retaining American jobs prepares to take office, the Obama administration and the U.S. defense industry are working on a deal with the Indian government to build iconic U.S. combat aircraft in India, the *Washington Post* reported. Both Lockheed Martin and Boeing have offered to manufacture the F-16 and F/A-18, respectively, in India as the country seeks to modernize its rapidly aging fleet of fighters. The proposals have the strong backing of the Obama administration, which has sought a closer connection with the Indian military in recent years. "What will be the U.S. policy posture now that the new president-elect is in the mix?" said one high-level official at an American defense firm in India. "Is he going to continue the policy of engaging in India on co-production and co-development? All of those are unknown at this point." Officials at Lockheed Martin and Boeing claim that any partnership to manufacture jets in India would not result in a net loss of American jobs.

Hewson Says Low Risk, Technical Maturity Key in USAF Competitions – Chairman, President and CEO Marillyn Hewson said Lockheed Martin is emphasizing offerings that are "low-risk" and "mature" in the upcoming competitions to replace the U.S. Air Force's aging training aircraft and ground surveillance planes, the *Washington Business Journal* reported. Speaking to investors at a conference in Florida, Hewson said the company is pitching Korean Aerospace Industries' proven T-50 to replace the T-38, a twin-engine, two-seat, supersonic jet used to train bomber and fighter pilots. "We believe we have the best offering today," Hewson said. "We've flown about 100,000 hours on the aircraft, it is very mature, it's proven, it's low-risk and we can provide it to the Air Force very quickly." Competitors Boeing and Northrop Grumman are expected to offer new designs in the competition, while a Raytheon-led team will offer an existing Italian airframe. Meanwhile, to replace the service's fleet of E-8C Joint Surveillance Target Attack Radar System (JSTARS) aircraft, all three competitors – Lockheed Martin, Boeing and Northrop – are expected to propose existing platforms.

Lockheed Martin Receives \$170M for French C-130Js – The company received contracts to commence work on four C-130Js that France will buy to compensate for delays in delivery of its Airbus A400M transports, *Jane's Defence Weekly* reported. The order includes two C-130J-30 transports and two KC-130J tankers. All four aircraft will be delivered in 2020.

German Economic Ministry Questions C-130J Buy – Germany's economic ministry questioned a defence ministry plan to buy U.S. transport planes, proposing instead the purchase of a Brazilian aircraft that could lead to subcontracts for German firms, *Reuters* reported. After a visit to an Embraer facility in Brazil, Brigitte Zypries, a state

secretary in Germany's economic ministry, said Embraer presented its own KC-390 transport aircraft as a "very convincing" alternative to the purchase of Lockheed Martin C-130Js. The Defence Ministry proposed buying four to six of the Lockheed planes and operating them jointly with France, as a complement to a fleet of A400Ms built by Airbus. It was not immediately clear whether Zypries' suggestion would prompt a review by the defence ministry. Lockheed Martin said it remained ready to work with Germany on meeting its airlift needs and referred questions to the German government.

Competitor Challenges Lockheed Martin to Airship Race – Solar Ship challenged Lockheed Martin to an intercontinental race, pitting the companies' airship designs against each other and promoting the benefits of using lighter-than-air technology for cargo transport, *FlightGlobal* reported. The Canadian manufacturer proposed that its Wolverine solar-powered aircraft fly against Lockheed Martin's hybrid airship in a "friendly race" covering two legs – one from California to the Arctic, then to Africa, and the second from South Africa to Uganda. Both companies have reported receiving launch orders for their airships. Lockheed Martin did not immediately respond to Solar Ship's challenge.

ROTARY AND MISSION SYSTEMS

LCS Program Rapped at Congressional Hearing – If President-elect Trump wants to eliminate wasteful spending, Rep. Jackie Speier thinks he should first look at the littoral combat ship (LCS) program, the *Washington Post* reported. Speier (D-CA), who called the ship a "dud" at House Armed Services Committee (HASC) hearing in early December, isn't the only one taking aim at the program. Earlier this month, Sen. John McCain (R-AZ) said it "is an unfortunate, yet all too common example of defense acquisition gone awry." The Navy planned to purchase 55 ships for \$220 million each, but cost overruns and delays have forced the service to revise its plan to 40 ships costing \$478 million each. They're also prone to breakdowns. Speier pointed to multiple engine failures, hull cracks and software malfunctions, saying "we have a ship that the Chinese don't even want to copy." Vice Admiral Thomas Rowden told the HASC that the Navy is "already seeing the benefits of our new approach on the waterfront," adding that LCSs have spent 500 days at sea, testing with other nations and performing humanitarian and relief operations. "The ship works," Navy acquisition chief Sean Stackley said. "We have reliability issues. We'll get through those, but the ship works."

USN's Troubled LCS Program at Crossroads, GAO Says – Congressional auditors warned that the U.S. Navy's littoral combat ship (LCS) program "stands at a crossroads" as the service prepares to ask Congress to authorize spending as much as \$14 billion to buy more of the troubled vessels, *Bloomberg News* reported. Congress must decide "whether a ship that costs twice as much yet delivers less capability than planned warrants an additional investment," the Government Accountability Office (GAO) said in a report. The Navy plans to ask early next year for authorization to build the final 12 of 40 ships, described as "frigates" that will be better-armed than the existing designs. The last two defense secretaries have cut back plans for the ship, built in two versions by Lockheed Martin and Austal. But it may gain a champion in President-elect Trump, who has vowed to increase the Navy's fleet to 350 ships from 272 today.

SASC Worried About Quick Transition from LCS to Frigate – Members of the Senate Armed Services Committee (SASC) questioned the Navy’s ability to ensure a smooth evolution of the littoral combat ship (LCS) to a frigate, given that current plans call for awarding contracts for 12 ships even before the first frigate is built and tested, the *U.S. Naval Institute News* reported. SASC Chair John McCain (R-AZ), long critical of the LCS program, bluntly declared that “this idea of a block buy before it’s a mature system is absolutely insane.” Navy acquisition chief Sean Stackley said the two LCS contractors, Lockheed Martin and Austal, are working on their frigate designs ahead of release of a formal request for proposals next summer. The exact details of the “block buy” plan are not yet decided and would be outlined in the FY 2018 budget request, Stackley said. Government Accountability Office chief Paul Francis encouraged lawmakers to make the frigate a separate acquisition program, and to base contract awards “on the demonstrated performance of the ships.”

USN Wants to Network LCS, Subs, Unmanned Systems – The U.S. Navy is looking to expand the web of connections currently linking its ships, planes and weapons to include submarines, smaller ships and unmanned systems to create a warfighting network that would be challenging for an adversary to bring down, *U.S. Naval Institute News* reported. Rear Adm. Ronald Boxall, the service’s surface warfare director, said that the Navy is comfortable with its Aegis Combat System and the Naval Integrated Fire Control-Counter Air construct built around it, but would have to expand networking to keep up with global threats. This means bringing in submarines, small ships like the littoral combat ship (LCS) and unmanned systems. Boxall said the addition of an over-the-horizon missile to the LCS is exciting because it helps extend the reach of the LCS ships individually and helps them take a more aggressive offensive posture, while also fitting in with this idea of a more netted Navy.

Sikorsky to Retain Marine One Support Work – Sikorsky will continue to perform maintenance on the Marine One helicopter fleet in Connecticut despite earlier plans by the U.S. Navy to take the work in-house and move it to a facility in Florida, *WTLV-TV* reported. Last July, the service announced plans to shift the maintenance duties to the Fleet Readiness Center in Jacksonville after contract talks with Sikorsky broke down. But the service and the company subsequently reached agreement on a deal to keep the work in Connecticut, a Sikorsky spokesman said.

Sikorsky Opens Combat Rescue Helicopter Testing Facility – Sikorsky opened a new testing facility to support development of the U.S. Air Force’s new combat rescue helicopter, *United Press International* reported. The new Systems Integration Lab will enable engineers to test avionics, flight controls, electrical power and integrated vehicle diagnostic systems for the planned fleet of 112 new combat search-and-rescue helicopters, intended to replace the service’s aging HH-60G Pave Hawks. Sikorsky program director Tim Healy said the lab “will identify any issues before advancing to test flight, and will help reduce the number of required flight test hours, resulting in time and cost savings for the customer.” He added that the lab will help to meet the Air Force’s desire to accelerate delivery of the new helicopters by at least six months. The lab is part of an initial \$1.2 billion contract that includes delivery of four HH-60W helicopters, six aircrew and maintenance training devices and support equipment.

Sikorsky to Provide H-60 Technical, Logistics Services – The U.S. Army awarded Sikorsky a \$93.8 million contract to perform technical and logistics services for H-60 helicopters, *United Press International* reported. The H-60 rotary-wing aircraft family encompasses a variety of helicopters including the UH-60 Black Hawk. Lockheed Martin markets the helicopter as a versatile platform capable of serving assault and transport roles. The vehicle has been utilized in military and humanitarian operations.

Sikorsky Signs Black Hawk Contract with Chile – Sikorsky signed a contract with the Chilean Air Force for six S-70i Black Hawk helicopters in a direct commercial sale, *Politico* reported. Sikorsky beat out offerings from AgustaWestland, Airbus, Korean Aerospace Industries and Rosoboronexport. Financial terms of the contract, while calls for delivery of the helicopters in 2018, weren't disclosed.

H-60 Still Favored for USAF Huey Replacement – The U.S. Air Force released its first draft for a replacement to the UH-1N Huey helicopter fleet, and appears to have rejected a potential requirement for a new aircraft to carry more troops than the current model, *Defense News* reported. If the service upped its requirement for troop capacity, it would have significantly limited its options, leaving Sikorsky's UH-60 Black Hawk as the likely winner. That prospect might not have necessarily troubled the Air Force, which initially considered sole-sourcing a contract to Sikorsky before lawmakers intervened. Richard Aboulafia, an aerospace analyst with the Teal Group, was skeptical that any other platform had a chance against the UH-60. "The definition of nine troops has gotten heavier over the years," he said. The service plans to buy up to 84 helicopters, and the winner of the competition will be responsible for providing training devices and courseware.

Sikorsky Reaches Settlement Over Fatal USN Crash – Sikorsky Aircraft agreed to settle wrongful death and negligence claims in a lawsuit filed over the 2014 crash of a U.S. Navy helicopter that killed three of the five crew members on a training exercise off the coast of Virginia, the *Associated Press* reported. Sikorsky reached a "settlement in principle" with the widows of the three crewmen and a survivor of the crash who filed the lawsuit in federal court in Connecticut last year. Terms of the deal have not been disclosed and await approval of a judge. The MH-53E Sea Dragon helicopter crashed on January 8, 2014, about 18 miles off the coast of Virginia Beach during what the Navy said was routine mine countermeasure training. A Navy investigation concluded that insulated electrical wires had likely chafed against a damaged fuel line, allowing a spark to escape through damaged wiring insulation and ignite fuel through holes in the line. The pilots became disoriented because of thick smoke from the fire, which led to the helicopter crashing into the ocean, investigators said. A lawyer for Sikorsky declined to comment, and a company spokesman did not return messages seeking comment.

Lockheed Martin Named Preferred Bidder for \$1B Chilean Frigate Upgrade – The company was selected as the preferred option to become the main contractor on a midlife upgrade program for Chile's three British-built Type 23 frigates, *Jane's Defence Weekly* reported. Sources said firms bidding for the contract, potentially worth up to \$1 billion, were informed of their status in early December. BAE Systems was listed as the second preferred option if negotiations between the Chilean Navy and Lockheed Martin

fail to reach an agreement, the sources said. Chile's three 4,900-tonne Type 23 multipurpose frigates, also known as the Cochrane class, were procured second-hand from the United Kingdom in 2005 and transferred between 2006 and 2008.

Lockheed Martin Revamps Training Division – The company is revamping its Training and Logistics Solutions division, *Defense News* reported. A news release spoke of “deriving solutions from a core repository of highly complex technical data that sets a baseline for training and logistics products.” Lockheed Martin's existing training and logistics products will fall within five areas labeled “Scios” (Latin for “knowledge”): SciosView for logistics products, SciosTrain for training systems, SciosTest for test and support equipment, SciosLive for Live Virtual Constructive training, and SciosReady for performance-based training programs. The company said the move will “better leverage internal resources to bring greater innovation and affordability to the market.”

MISSILES AND FIRE CONTROL

Lockheed Martin Awarded \$1.45B for PAC-3 Missiles – The company received a \$1.45 billion contract for Patriot Advanced Capability-3 (PAC-3) missiles, spare parts and ground support. The contract includes missiles and services for the U.S. Army, as well as for South Korea, Qatar, Saudi Arabia, Taiwan and the United Arab Emirates, the Pentagon said.

U.S. Approves Sale of JASSM-ER to Poland – The U.S. State Department approved the sale of Lockheed Martin's Joint Air-to-Surface Standoff Missile-Extended Range (JASSM-ER) to Poland, *United Press International* reported. The U.S. Defense Security Cooperation Agency estimated the sale's value at \$200 million. It includes 70 JASSM-ERs, several flight test vehicles and upgrades to Poland's fleet of F-16s so they can launch the missiles. Poland purchased the basic JASSM in 2014. The extended-range version entered service with the U.S. Air Force in 2014. Both versions carry a 2,000-pound warhead and use infrared seekers in combination with anti-jam global positioning system data to precisely strike targets.

U.S. OKs \$3.5B Apache Sale to UAE – The U.S. State Department approved the possible sale of Apache AH-64E attack helicopters to the United Arab Emirates (UAE), *United Press International* reported. The foreign military sales request includes 28 remanufactured helicopters from Boeing. They would be equipped with sensors including Lockheed Martin's Modernized Target Acquisition and Designation systems, and weapons capabilities supporting Lockheed Martin's Hellfire missiles. The total estimated cost of the program is \$3.5 billion.

USAF Awards \$67M for Saudi Spares – Lockheed Martin received a \$67 million contract from the U.S. Air Force to deliver spare parts for targeting and navigation systems used aboard the Royal Saudi Air Force's F-15 fighters, *United Press International* reported. The agreement covers parts for the company's Infrared Search and Track (IRST) systems, Sniper advanced targeting pods, and Low Altitude Navigation and Targeting Infrared for Night (LANTIRN) extended range navigation pods. Lockheed Martin has provided sensor systems for the kingdom's fighter fleet since 1996. Deliveries of the spares are expected to begin in 2018.

Japan Considering THAAD – Japan moved closer to the introduction of a U.S. anti-ballistic missile shield as Defense Minister Tomomi Inada said such systems would strengthen Japan's defense capabilities, *Bloomberg News* reported. The government doesn't have a concrete plan to introduce the Terminal High Altitude Area Defense (THAAD) system, but Defense Ministry and military officials are "considering what can be done," Inada said. Japan, which faces a growing threat from North Korea, already has a two-layer ballistic missile defense system. Its ship-based Aegis system targets missiles in space and land-based Patriot Advanced Capability-3 batteries intercept them as they near the ground. THAAD is capable of intercepting missiles in or outside the Earth's atmosphere. The *Yomiuri* newspaper reported that the government will set up a panel to consider THAAD, and Inada will visit Guam to inspect the technology at a U.S. base.

Lockheed Martin Conducts Additional TACMS Test – The second test of the company's modernized Tactical Missile System (TACMS) was successfully conducted at White Sands Missile Range, NM, *Jane's Defence Weekly* reported. In the test, the upgraded TACMS missile was fired from a Lockheed Martin-built High Mobility Artillery Rocket System (HIMARS) launcher and flew a short-range trajectory. The test demonstrated the missile's proximity sensor height of burst enhancement, the company said, adding that qualification tests should be completed by July 2017.

SPACE SYSTEMS

Company Completes Upgrade of GPS Ground Control System – Lockheed Martin completed a major upgrade to the ground control system for the U.S. Air Force's Global Positioning System (GPS) satellite constellation, *GPS World* magazine reported. The Commercial Off-the-Shelf Upgrade #2 project, awarded to Lockheed Martin in 2013, is the latest step in the service's multi-year plan to refresh technology and modernize the GPS ground control system. The system manages transmissions, performs data analysis and issues commands to GPS satellites; it includes a master control station, 11 command and control antennas and 15 monitoring sites. The upgraded system is now managing the 31 GPS IIR, IIR-M and IIF satellites that make up the GPS constellation.

ULA Launches New USAF Communications Satellite – A United Launch Alliance (ULA) Delta IV rocket successfully boosted a U.S. Air Force communications satellite into geostationary orbit from Cape Canaveral Air Force Station in Florida, *Space.com* reported. The Wideband Global SATCOM-8 spacecraft, built by Boeing, was the eighth in a planned constellation of 10 satellites intended to service as the backbone of the U.S. military's global communications. ULA is a joint venture of Boeing and Lockheed Martin.

Atlas V Launches High-Speed Internet Satellite – On its final mission of the year, a United Launch Alliance (ULA) Atlas V successfully launched a broadband satellite for EchoStar, *Space News* reported. The EchoStar 19 satellite was built by Space Systems Loral and is designed to provide broadband Internet access to customers of HughesNet service in North America. In August 2015, EchoStar switched the launch from Arianespace to ULA in order to launch the satellite sooner. The launch was the 12th of

the year for ULA and the 115th since the Boeing-Lockheed Martin joint venture was formed in 2006. Current manifests call for about 14 ULA missions in 2017.

Pentagon Watchdog Clears DoD, ULA after Investigation – The Pentagon’s inspector general found that the Defense Department did not provide an unfair advantage to United Launch Alliance (ULA) in a competition for space launches, *Politico* reported. The investigation, launched in March 2016 at the request of Defense Secretary Ash Carter, found that the Pentagon “did not give an unfair advantage and did not collude” with the Boeing-Lockheed Martin joint venture for National Security Space (NSS) launch contracts. Furthermore, the investigation concluded that ULA did not improperly transfer five Russian-made RD-180 rocket engines from NSS launch missions to commercial launch missions to influence congressional legislation. The probe was prompted by claims of a former ULA executive that the Pentagon wasn’t pleased that ULA didn’t bid against rival SpaceX on a military space launch in 2015, even though the government “bent over backwards to lean the field in our advantage.”

ULA Receives \$269M Launch Services Contract – The Pentagon awarded United Launch Alliance (ULA), a joint venture of Boeing and Lockheed Martin, a \$269 million contract modification for Delta IV Heavy launch vehicle services, *United Press International* reported. The award covers services for the U.S. Air Force through 2020. The Delta IV Heavy is one of five configurations of the Delta IV family of launch vehicles. The heavier variant uses two additional common booster cores, or CBCs, to supplement the first-stage CBC during launch.

USAF Awards Funding for ICBM Sustainment – Lockheed Martin received \$60 million to sustain and modernize intercontinental ballistic missile re-entry systems for the U.S. Air Force, *United Press International* reported. The funding raised the cumulative value of the sustainment contract, initially awarded in 2010, to almost \$107 million. The Boeing-made Minuteman III intercontinental ballistic missile, or ICBM, entered service in the 1970s; it is the only land-based ICBM in service in the U.S.

Lockheed Martin Reps Visit Cheyenne Ahead of ICBM Bid – Company representatives visited Cheyenne to gauge the services and businesses the city offers ahead of its bid to upgrade the U.S. Air Force’s land-based intercontinental ballistic missiles (ICBMs), the *Wyoming Tribune Eagle* reported. Boeing and Northrop Grumman also are competing for the estimated \$60 billion program to upgrade missiles at Air Force bases in Wyoming, Montana and North Dakota. Lockheed Martin officials said that identifying potential local partners in advance would give it a head start on the program’s next phase. Sometime in the second half of 2017, the Air Force is expected to select two of the three bidders to move on to a three-year concept development competition, with one winner ultimately selected for the whole project.

USN Awards Funds for Trident Sustainment – Lockheed Martin received a contract modification worth \$88 million to support the U.S. Navy’s Trident II missiles. The company will provide field processing and deployed system support services for missiles deployed with both the U.S. and British navies, the Pentagon said. The new funding supports work through September 2021.

Lockheed Martin Moving 100 Jobs from California to Colorado – The company said it will move 100 jobs from San Diego to Littleton, CO by May in a cost-saving move, *KGTV* reported. “We continually evaluate our operations to identify opportunities to increase affordability,” Lockheed Martin said in a statement. “...Reduction of duplicate laboratories and facilities operating costs improves the affordability and efficiency of our business, which better serves our customers.” It was not immediately clear how many of the employees might accept the company’s offer to relocate. Lockheed Martin said it will maintain a customer support field office in San Diego.

~end~

IN MEMORIAM DEC 2016

George (Andrea Estrada) Graff	Nov. 13, 2016.
George (Pat) Wiltsey	Dec. 7, 2016.
Barbara Todd	Nov. 15, 2016.
Roger (Mary) Todd	Oct. 27, 2016.

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We are pleased to announce the Credit Union will once again pay a Loyalty Dividend to qualifying members. The 2017 dividend will total \$3 million and will be credited to accounts in February (what a great way to start the year!).

We wish our Star Duster friends all the best in 2017.

To learn more, visit www.lfcu.com or give us a call at (800) 328-5328.

Logix Federal Credit Union is pleased to support the Star Dusters newsletter publication.

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Associate Editor: John Shelton
editor@lmstardusters.org

STAR DUSTERS SOUTH COAST SATELLITE LUNCHEON
MONDAY, FEBRUARY 20, 2017
GEMMELL'S RESTAURANT, DANA POINT HARBOR
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949-234-0064

- HAPPY HOUR:** 11:00 AM (no host bar)
- LUNCHEON:** 12:00
- COST:** \$26.00 per person
- DEADLINE:** Reservations must be received by February 13, 2017
- SPEAKER:** TBD
- CANCELLATIONS:** Refunds will be made when requested before the luncheon, with a self-addressed, stamped envelope.

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COST: \$26.00

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JULIUS OLZER

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