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MARS STAR





MARS STAR has gone digital!!

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MARS Activities This Quarter: Holiday Event - December 1 - See page 29

MARS Associates: A Social Club for Retirees of Lockheed Martin & United Launch Alliance

OFFICERS

President President-Elect VP Activities VP Business VP Communication VP Membership Treasurer Secretary Historian POC	Dick Sosnay Ken Marts Linda Duby Bill Schrott Mike Carroll Carl Kaminski Charlie Haupt Al Nemes Barb Sande	303-972-9209 303-868-2168 303-249-1665 303-808-3083 303-941-4193 303-726-1546 303-798-7113 303-908-0157 303-887-8511
DIRECTORS		
Director Chair Director Director Director Director Director Director Director	Roger Rieger John Janczy Bill Wise Robin Zen (LOA) Monte Kopke Daniel Crumb Debbie Carr Dan Ellerhorst	303-912-6217 303-973-3847 303-771-4887 303-335-6443 303-973-4301 303-909-0490 303-503-7113 303-794-0750
MARS STAR		
Editor Editor Memorials Webmaster Volunteers Reporting:	Tom Pighetti Linda Stearns Norma Emerson Jim Kummer Judy Nielsen	303-979-7933 303-797-3557 303-646-1137 303-986-3966 303-905-3957
Cape Canaveral Colo Springs Vandenberg	Dick Olson Doug Tomerlin Charlie Radaz	321-452-4015 719-594-6392 805-733-2051
CLUB CONTACTS		
Bridge Car Club Dinner	Dave & Kathy Martz Roger Rieger Becky & Gary Englebright	303-683-9524 303-912-6217 303-973-4062
Golf Hiking Photography	Anita Kannady Bo Rodriguez Sue Janssen John Chapter (Pres)	303-794-9210 303-798-9157 303-936-8339 303-986-8277
REMINDER:		

If you move, please give the membership VP a change of address. <u>Also, if you are a snowbird, let us know when</u> you are leaving and when you plan to return so your MARS STAR can be sent to you. It costs us 70 cents for each STAR package returned.

(Published quarterly by MARS Associates, Retirees of Lockheed Martin Corporation and United Launch Alliance, Denver, CO)

IMPORTANT PHONE NUMBERS	
LM Employee Service Center	1-866-562-2363
MARS Important Phone Numbers	
(Be sure to have your MARS ID available)	
MARS Delta Dental of CO	
Individual Team (representatives)	1-877-516-6512
Ron Rueger (Account Mgr)	303-889-8616
Assured Partners of CO	
MARS Delta Dental "Vision" (EyeMed)	
MARS Vision Service Plan (VSP)	
Jon Elmore	303-228-2206
Hudson Howard	720-510-9505
Sharla Leary	720-510-9507
Aetna/Medicare Plus	1-888-562-8111
Kaiser Advantage Plus	303-338-3800

MARS Associates P. O. Box 1128 Littleton, CO 80160-1128

MARS Website: <u>https://www.marsretirees.org</u> MARS Facebook: <u>https://www.facebook.com/groups/MARSAssociates</u>

Cover:

- L: Three Decades of Mission Support A screen capture from the introductory video of the article about Mission Support on the LM website. See LM News page 24.
- R: ULA LandSAT launch Mission Success Graphic See article on page 22.

From the Editor's Desk

Linda Stearns (<u>linda80120@comcast.net</u>) Tom Pighetti (<u>tipighetti@q.com</u>)

For comments or corrections, contact Linda (issue editor) or Mike Carroll, V.P. of Communications.

MARS welcomes your submissions. Submissions must be relevant to the MARS organization, informative, and appropriate for this newsletter. No personal dialogues or opinion pieces will be accepted.

Please submit your article for approval <u>in advance</u> to the V. P. of Communications. Articles will be included as time / space allows.



President's Corner By Dick Sosnay (richardsosnay@gmail.com)

We want to thank all our members for bearing with our MARS Association as we tried to steer our way through this trying time of a year and a half of the pandemic. We started this year by trying to return to the MARS activities that many of us have enjoyed throughout the year, while keeping an eye on the pandemic. We are trying to expand our activities to entice new members, as well as continue to make our activities more eniovable for existing members. We have had a successful and fun summer so far. We started out with our first Happy Hour on June 30, and Senior Recognition Luncheon on July 14, followed by our Rockies game on August 18, our great Annual Picnic on September 8, and our second Happy Hour on September 29. Thanks to all the MARS members who attended those events and continue to help make our MARS Association a fun and vibrant group.

The last two events were really fun, and both had large attendance, a sure sign we are coming out of the pandemic, and we are anxious to get back to doing fun things. The Picnic was a nice, sunny day (although a little smoky), and we had great attendance. In addition to the chance to see old friends, we had our vendors there including Hearing Rehab, Red Rocks Credit Union, Assured Partners (representing Delta Dental and Vision Service Plan), Aetna and Kaiser Permanente. In addition, we had two guests that provided information about adult learning courses: the Learning Academy and Osher Lifelong Learning Institute (OLLI). And we had great food, beer and wine, and our popular door prizes that included donated prizes, and some nice cash gifts. The last Happy Hour also had great attendance, and since the weather was a little threatening, we moved it inside—another chance to see old friends and meet new ones. We plan to have more Happy Hours throughout the year-a great chance to get out, enjoy yourself and socialize with existing members and potential new ones.

Still coming up this year is our Holiday Celebration on December 1^{st} at the Wellshire Inn. That is a new location for us, with a great menu, and it sounds like it will be another fun MARS event. We hope to see you there.

For next year, in addition to our normal MARS activities, we have been looking at additional activities for our members, including more frequent Happy Hours, tours and more presentations. You can find more discussion on those items in **Next Up**, the article by Ken Marts, President-Elect.

Not all our activities are coming back to normal as fast as we had hoped. Both the Dinner Club and the Hiking Club have been showing reduced attendance in their activities lately. It is sometimes hard to get back into activities after laying off so long, but both clubs are great clubs and provide our members fun things to do. We hope that our members will once again start to respond to those clubs and increase their participation. If you have any ideas on future activities for either of those clubs, make sure you let the club leaders know.

We have had success in identifying authors to write volunteering articles for the MARS STAR. This month's STAR will again include that feature—thanks to Raeanne Frazer for volunteering. As thanks for doing that, the MARS Association provides that volunteer organization a check for \$50. More importantly, it provides information about the volunteer organization and their goals to our membership, and provides other retirees information about volunteer organizations that they might be interested in. If you are interested in writing about your volunteer organization for the January, 2022, MARS STAR (or future MARS STARs) please let me or any of the officers/directors, know.

Volunteers are the heart of this organization. They provide us the means to provide the activities and services that MARS offers. We have other ideas that the marketing committee is currently considering. Any of our potential new activities will also require more volunteers for them to succeed. And we are continually looking for volunteers to step up to fulfill the roles of officers, directors, and the other volunteer positions that make this organization a success. If you enjoy our MARS activities, please step up and volunteer to help backfill existing open positions or put your name down as interested in helping in the future. The officers and directors extend thanks again to all the present and future volunteers who help make MARS the great organization that it is.

I am really looking forward to the upcoming MARS activities as our world gets back to almost normal. Thanks to all our members for bearing with us during this last year or so. We are looking forward to the rest of this year, and we hope you all have a happy Holiday Season.



Next Up By Ken Marts (martshouse2@aol.com)

2020 is a distant memory now and 2021 is racing along to join it in the rearview mirror. The differences in the 2 years are startling. 2020 saw the outbreak of COVID-19, shutting the economy down and keeping most people at home. 2021 allowed us to open up a bit and get back to a more normal lifestyle. MARS events were cancelled for 2020 but 2021 saw us gathering in person again. We had our first Happy Hour June 30 followed by a second one in September. The Rockies baseball game was enjoyed by more than 30 of us on August 18 and the annual picnic drew more than 200 people. Looking forward to 2022, all our events have been planned at the preliminary level as in-person events.

Now that more of us are getting out, I wanted to share some travel experiences my wife and I had this year. 2021 allowed us some time every month to visit several Colorado parks and National Monuments. February was Steamboat Springs for cross-country skiing. March found us in Grand Junction for the Colorado Monument and several wineries. April found us in Estes Park (Rocky Mountain National Park) and Durango (Mesa Verde). Montrose was our destination for May to enjoy some biking and a trip through The Black Canyon of the Gunnison as well as several microbreweries. June was the month to camp in Paonia to hike, bike, and visit several more wineries. August involved a camping trip to Grand Mesa waking up to snow our first morning there (we weren't quite ready for that!). In September we travelled to Carbondale for the fall colors over McClure Pass and some touristy things in Glenwood Springs as well as a slooooooow trip from Marble to the Crystal Mill. Hopefully, some of you have also been able to travel and enjoy the sights.

I mention the travelling we did because it was all in Colorado and there are a ton of sites we didn't visit, but plan to in the future. Learn to enjoy the beauty of our state of Colorado or whatever state you currently live in. Learn some of the secret history you may not know about near where you live. Get out and ENJOY life, regardless of how you define that enjoyment.

The Marketing Committee is still evaluating the results of our recent survey that was mass-e-mailed to most of you. The responses indicate interest in doing NEW things with MARS Associates. These include local day trips to various locations, guest speakers to talk on a variety of topics at our events as well as independent of them, and even some weekend trips. I look forward to hearing more from you on ways you'd like MARS to grow and provide leisurely opportunities. As with all our events and clubs, we rely on volunteer help to organize and plan these activities. Reach out to the Officers or Directors if you would like to schedule an activity or need help in hooking up with others interested in leading these activities. Some activities that are in the preplanning or discovery phases are:

- 1) LM Tour for later this year (Judy Nielsen),
- 2) Museum of Nature and Science in Q1 of 2022 (Dan Ellerhorst),
- 3) Central City Opera House in 2022,
- 4) Durango Train Ride,
- 5) VIA Medicare presentation in late 2021/early 2022 (Ken Marts and Bill Schrott),
- 6) NASA Space-related presentations in 2022 (Barb Sande),
- 7) Breckenridge Sleigh Ride with Dinner, January or February 2022.

Interest sign-up sheets will be available at the Holiday Luncheon, and will go out in a mass e-mailer to indicate your interest in an activity. I appreciate the several MARS members who have stepped forward and become valued members of the Marketing Committee: Bev Baugher, Vicki Ellis, Carol Lovelace, and John Grace.

As always, please contact me if you have suggestions for improvements or items you would like MARS Associates to consider. As the Marketing Committee Chair, I'm open to topics to discuss with the committee to bring forward to the other officers and directors at our monthly meetings. Your input is always appreciated.



Director's Notepad By Roger Rieger Chairperson, BoD (rrieger10731@gmail.com)

Greetings! Hope all of you have had a wonderful summer and are staying safe as we continue adjusting to the craziness of the times. Hope you have been able to participate in the MARS events which have returned this summer and recognize that a lot of work goes into putting together these fun events, and that work is all done by volunteers. The MARS Associates organization, the various MARS clubs, and this newsletter, would not exist without the time, skill and dedication given by your fellow MARS members.

The MARS Board of Directors consists of up to 9 Directors whose charter is to support the Officers in the performance of their duties and implement a succession plan to ensure an orderly transition of duties as Officers and Directors complete their terms of office.

As a 100% volunteer organization, MARS only functions when members step forward and volunteer their time and efforts. I would like to give my sincere thanks to those that are currently serving as Officers and Board members, as well as those who are heading up the various MARS clubs-without you there would not be a MARS organization. We are constantly seeking new input from our club members, and especially have a need for more people willing to volunteer and share their time and talents to further the Club. PLEASE consider volunteering some of your time and energy to the club, most positions require a modest effort, less than 10 hours per month. The members of the board may also be reaching out to you personally as we work to develop a robust succession plan and ensure the continuing viability of the MARS organization.



Communications Mike Carroll (mjcarroll78@gmail.com)

Communications encompasses the MARS Facebook page and group, the MARS web site, and the production of the MARS STAR quarterly newsletter. A hard-working team of volunteers (authors, editors, administrators, and assemblers) produce this wonderful newsletter you are reading. The STAR would not be possible without these dedicated volunteers.

There is an open volunteer position for a <u>Newsletter</u> <u>Editor</u>. The primary needed skill is familiarity with MicrosoftWord and PowerPoint tools.

I welcome any MARS member or friend interested in this editor position to contact me at 303-941-4193 or mjcarroll78@gmail.com for more details.



Activities Updates By Linda Duby

(lindaduby@comcast.net)

On July 14, MARS held its first major activity of 2021 – the Senior Recognition Luncheon. It was held at the Manor House at Ken Caryl and 80 members and guests attended. Everyone who attended thoroughly enjoyed the food, the venue and just being able to get together. The Manor House did an excellent job on the food and service at this beautiful, historic venue. Check out the pictures from the luncheon on the MARS website.

Second was the MARS at the Rockies Picnic and Game – On August 18, 35 members and their guests enjoyed a picnic of hot dogs, brats, chicken legs, mac 'n' cheese and veggie patties, with chips and sides, lots of cookies and fountain drinks. Some also visited the cash bar for stronger libations! They enjoyed watching the Rockies hit two home runs to aid in defeating the Padres 7 to 5. It was a beautiful day (the view somewhat marred by wildfire smoke in the air). Pictures are also on the website.

The next event was the Annual Picnic on September 8. It was held at Clement Park, and Bennett's BBQ again did an excellent job catering the food. We had an excellent turnout with 192 members and their guests attending. The vendors who supported this event were Hearing Rehab Center, Beta Health, Delta Dental, Assured Partners, Kaiser Permanente, Red Rocks Credit Union, and Aetna. We had two new organizations at the picnic this year – The Academy for Lifelong Learning and Osher Lifelong Learning Institute at the University of Denver (OLLI).

The Picnic door prize winners are listed below. Congratulations to all the winners!

Prize & Donor	Winner
\$50 Panera gift card Assured Partners	John Wankum
\$50 Gift Card MARS Dinner Club	Wendy Keil-Gonzales
Gift Bag Kaiser Permanente	Rita Nicholson
\$50 Panera gift card Assured Partners	Dennie Bernier
Gift Bag with electric toothbrush Delta Dental	Judy Sullivan
\$50 Gift Card MARS Dinner Club	John Grace
\$50 Cash Door Prize MARS Associates	Phyllis Brudos
\$50 Cash Door Prize MARS Associates	Don Skinner
\$50 Cash Door Prize MARS Associates	R. J. Jenson
\$50 Cash Door Prize MARS Associates	Van Vandeventer
\$50 Cash Door Prize MARS Associates	Darold Groat

\$50 Cash Door Prize MARS Associates	Rita Valdes
\$100 Cash Door Prize MARS Associates	Debra Lenzotti
\$100 Cash Door Prize MARS Associates	Glenda Haupt
\$200 Cash Door Prize MARS Associates	Carole Dergance
\$300 Cash Door Prize MARS Associates	Tom Jones

The next event coming up is the Holiday Celebration on December 1. This year the event is being held at the Wellshire Event Center located at 3333 South Colorado Boulevard. We are looking forward to having the event at this venue. The flyer with the menu options is in this STAR and on the MARS website. MARS will be collecting donations for Toys for Tots this year. You can bring a new, unwrapped toy or make a monetary donation. We will be collecting those at the check-in table.

There are two methods of payment for the Holiday Celebration – check or electronic payment via STRIPE. If you chose to use STRIPE, please make sure you select a meal for yourself and your guest and that your credit card is charged for each meal. STRIPE will send you an email confirmation of the charge and you can verify your reservation. If you have any questions about the STRIPE reservation, you can contact me at <u>lindaduby@comcast.net</u> or by phone at 303-249-1665.



Business By William Schrott (wmschrott@msn.com)

I'm sure as you read this newsletter my teammates have mentioned the great time we had at the annual picnic. Several of our vendors were there supplying information about their services and products. Hope you were able to attend the picnic, the food was very good and the fellowship was fantastic.

VIA BENEFITS^{**} I would hope that all members of MARS Associates know that VIA is the administrator of the allocation by Lockheed Martin of \$900 to each of their retirees on Medicare for reimbursement of medical expenses, for a total of \$1,800 per year for member and spouse. If you are currently on Medicare—or are approaching the age where you will start Medicare—and you have not been working with VIA, go to their site (my.viabenefits.com) to find out if you qualify. I have had a few phone calls from members telling me about their experience with VIA Benefits.

VIA offers more than handling reimbursement of medical cost. They also provide members with information and estimate costs for Medicare supplement polices, drug insurance plans, vision plans, and dental insurance. Members report that they find better rates and coverages through VIA. I, myself, have found this true in the dental plan area.

I encourage members to explore the VIA web page to evaluate the products they offer. The fall VIA Benefits newsletter is also available. If you do not get it, I'll send it to you. Just email me at <u>wmschrott@msn.com</u>.



Membership Report By Carl Kaminski (carlcolo@centurylink.net)

MEMBERSHIP STATISTICS

As of October 1, 2021, there are 1,272 MARS Associates members, including 642 senior members. We have a total of 78 new members who have joined MARS for the 2021 CY.

Please welcome the following new members who have joined this quarter:

<u>Colorado</u>

Aurora	Ingrid De Greef
Castle Pines	Deborah Morton
Castle Rock	James & Lisa Moehlenpah, Jr.
Centennial	Holly Dupree, Terry & James Lilly, Deborah Mues, Donna O'Neil, Stephan & Therese Saurber
Elizabeth	Gerald Corsi
Highlands Ranch	Lisa Cox, Donald & Melinda Dart, Michael Klein, Jean Ann Pelletier
Lakewood	Norman Luepschen, Linda & John Mc Dowell
Littleton	Joan & Charles Adinolfe, Gary & Lisa Carlsen, Cary Clark, Paul & Teresa Cline, Vicky Ellis, Larry &

Susan Hines, Michelle Hinz, Lillian & Robert Myers, Lori & Jeffrey Rauen, John & Lorraine Wankum, David & Lynne Zimmerman

Morrison Edward Mankowski

Other States

<u>Pennsylvania</u>

Trafford Edward & Katrina Lichtenfels

<u>Texas</u>

Colleyville	George &
	Barbara Standridge

<u>Virginia</u>

Arlington Jon & Joy Watada

NEW MEMBERS

Do you know someone who recently retired from LM or ULA? First year membership in MARS is free for 2021. Direct them to the website for more information or have them contact one of the Officers or Directors.

MEMBERSHIP CARD LOST?

A MARS Associates membership card was attached to your welcoming letter when you first joined MARS. If you're like me however that letter has been filed away someplace and not easily found. If you should have a need for a replacement card, contact the Membership VP.

Change of email address or phone number?

Given the rapidly changing environment we are all dealing with, it's more important than ever that we have current email and phone information for our members. Please remember to include the MARS membership team in your list of people to notify when you have a new phone number or email. We want to make sure all communications are timely.

In Memoriam

By Norma Emerson (emer801@msn.com) Please contact me at the above e-mail address or at 303-646-1137 with information about the passing of a member, the spouse of a member or other MM/LM retirees so they can be acknowledged in the Memoriam section.

MARS Associates expresses our deepest sympathy in the loss of your loved one, and a donation will be made to a charity chosen by the Officers and Board of Directors in their memory.

Members

Crew, Elizabeth "Betty" (D: June 2021) New Port Richey, FL https://tinyurl.com/47zvt4fb

Karas, Theodore "Ted" (D: July 2021) Aurora, CO No obituary published

Koski, Arthur "Art" (D: July 2021) (Survived by Suzanne Koski) Morrison, CO <u>https://tinyurl.com/uyajfv8u</u>

Luhman, Bonnie Mae (D: September 2021) (Survived by Fred Luhman) Lakewood, CO https://tinyurl.com/f89rfahe

Peterson, Anne (D August 2021) Conifer, CO <u>https://tinyurl.com/ax4nhm8b</u>

Pitt, Wallace "Ben" (D: July 2021) (Survived by Patricia Pitt) Denver, CO https://tinyurl.com/t354npbs

Sappenfield, Anna (D: August 2021) (Survived by Carl Sappenfield) Goodyear, AZ No obituary published

Steen, Ronald (D: July 2021) Englewood, CO https://tinyurl.com/432dexar

Tieleman, Carole (D: May 2021) Sedalia, CO No obituary published

Non-Members

Bacon, Sue Ann (D: August 2020) (Survived by Keith Bacon) Littleton, CO <u>https://tinyurl.com/btb4pz8n</u> Berry, James "Jim" W. (D: July 2020) (Survived by Kroyla Berry) Littleton, CO https://tinyurl.com/uuzmw7cz

Blair, Michael (D: September 2021) (Survived by Judith DeNapoli) Littleton, CO https://tinyurl.com/2at7jcjk

Flater, John (D: July 2021) (Survived by Willa Flater) Littleton, CO https://tinyurl.com/2ynn9t4c

Hales, Donald "Donnie" (D: August 2021) (Survived by Beverly Hales) New Smyrna Beach, FL https://tinyurl.com/dycmhxjk

Malone, Thomas (D: July 2021) Merritt Island, FL No obituary published

Rozycki, Barbara Mae (D: August 2021) Centennial, CO <u>https://tinyurl.com/mar4sww3</u>

Schappell, Roger (D: July 2021) (Survived by Margo Schappell) Wheatridge, CO https://tinyurl.com/36bavhp4

Shuey, Robert D. (D: July 2021) Whitesboro, TX <u>https://tinyurl.com/7kbuxzu4</u>

The MARS Associates Website

By Jim Kummer (jkummer@comcast.net)

There is a document on the MARS website that you may not have noticed. At the top of the **Benefits** page there is a document titled "What to Attend to When Your Loved One Dies." This document is not intended to supplant the services of a minister, lawyer or funeral advisor, but does serve as a useful checklist for pre- and post-needs. Death is not a particularly pleasant prospect to consider, but at our age, it is a given that at some time our loved ones are going to leave us. The document can serve as a reminder of official papers we need to keep up to date, and itemizes those we need to contact and also the tasks we must attend to. Take a look – hopefully you'll find it a useful reference. You may want to print a copy for reference. Here are the websites of the month that the web committee has offered for your browsing pleasure.

Jul – Take a Virtual Tour through the <u>National Air and Space Museum</u> Aug - Get the Scoop on Latest Movies at <u>www.moviefone.com</u> Sep – Get the latest tech news at <u>gizmodo.com</u>

Your website committee members welcome your suggestions for improvement of the website. It's been a while since we received any input. If you frequent websites you think would be of interest to our membership as websites of the month, you can email them to me at <u>jkummer@comcast.net</u>. Your website committee members are Bob Knickerbocker, Linda Stearns, Duane "Smitty" Smetana, Al Butvidas, and Jim Kummer (Webmaster).



Project Angel Heart By Raeanne Frazer (raeannecfrazer@aol.com)

"Food is Medicine". That's the tag line of Project Angel Heart (PAH).



Project Angel Heart Denver Office Photo Credit: Project Angel Heart

Project Angel Heart was "born" 30 years ago beginning with one pan of lasagna donated from Racine's Restaurant serving 12 HIV/AIDS patients. Currently PAH has expanded into a 30,000 sq. foot facility in Denver's Globeville neighborhood. This year PAH expects to serve over 3,500 clients who have any life-threatening illness: cancer, COPD, congestive heart failure, kidney disease and many other illnesses. There are no age or income restrictions. Each week PAH provides seven nutritious entrees, bread, fruit, and milk. The entrees are delivered frozen so that clients can reheat the meals whenever they'd like. In February we delivered our 8 millionth meal!



Preparing Meals Photo Credit: Raeanne Frazer

The mission of PAH is to prepare and deliver medically tailored meals to people with life-threatening illnesses at no cost to them. Our professional chefs and registered dietitian prepare all meals from scratch. Incorporating a wide array of culinary traditions and cultures, they create meals that feature fresh, high-quality ingredients—including vegetables and herbs from the PAH garden and local community farms.



Meals ready to distribute. Photo: Project Angel Heart

When COVID-19 hit and the state-wide stay-at-home order was issued, PAH delivered over 16,000 shelf-stable meals in addition to each client's regular frozen meals,

to make sure that no one would be left without food in case we couldn't deliver their weekly meals. Luckily, we were able to deliver all meals each week just as we normally do. Additionally, the PAH facility became a COVID-19 vaccination pop-up site for several months due to its central location for underserved communities in the area.



Adding the meals Photo Credit: Raeanne Frazer

I have been involved with PAH for almost 20 years—first just financially by joining their Bread and Butter Club of monthly donors, and upon retirement 10 years ago I became a weekly volunteer as well. I have enjoyed "honing" my culinary skills in their professional kitchen and now I work at the front desk. Other volunteer opportunities include meal delivery drivers, meal bag decorators, distribution, special events and many other options. Volunteer opportunities range from weekly to once a year. There is a spot for everyone!

Meals are delivered in the Denver/Boulder region including parts of Boulder and Weld counties, metro Denver and west into Golden. Delivery areas also include Highlands Ranch, Parker, and the Colorado Springs metro area. If you live outside of the delivery areas, you can arrange to pick up your meals at PAH or have them delivered to an alternate address such as a friend or family member who lives within the delivery boundaries.

Because PAH is a non-profit that means fundraising is important! A few of the major fundraising events are Dining Out for Life in April, the July virtual cereal drive, A Taste for Life on October 14, and Pie in the Sky from October 1 – November 23. I will be selling pies again this year so if you are interested, please look for my "sellers page" on the PAH website.



Decorated bags ready to deliver to clients. Photo: Raeanne Frazer

If you would like further information about PAH, please visit their website at: <u>www.projectangelheart.org</u> or call 303-830-0202.

Historian Corner

By Barb Sande (barbsande@comcast.net)

Program Profile

This issue profiles the Apollo 15 mission, starting with a personal reminiscence of its launch that I saw from Titusville with my parents. (I was going into my junior year of high school). I met LM pilot Jim Irwin later while in college and developed a mentoring relationship via letters back and forth with him, which is briefly discussed in his biography. I was a space fanatic probably dating back to John Glenn's flight in February, 1962 in the second grade, an unusual interest for a little girl at that time, but I loved math and science and loved reading about the challenges of spaceflight. Apollo 15 was a big step forward in advanced lunar exploration and one of the most exciting times in my life, because I talked Mom and Dad into driving to Florida from Colorado on our summer vacation with the hopes of seeing this launch in person. That trip sealed my fate-I was going to be an engineer working in the space program!

Apollo 15 Mission Overview

Launched: 07/26/1971 13:34:00 UTC LC-39A, KSC Splashdown: 08/07/1971 20:45:53 UTC, North Pacific, USS *Okinawa* recovery ship Saturn V AS-510 Launch Vehicle CSM (Command/Service Module) Call Sign: *Endeavour* (CSM-112) – named after the ship used on one of James Cook's scientific voyages LM (Lunar Module) Call Sign: *Falcon* (LM-10) – named

LM (Lunar Module) Call Sign: *Falcon* (LM-10) – named after the USAF Academy mascot

Crew: Commander David R. Scott, LM Pilot James B. Irwin, CM Pilot Alfred M. Worden (all Air Force crew) 74 total lunar orbits

Landing site: Hadley Rille Area (Mare Imbrium) – 26.1322 degrees N, 3.6339 degrees E lunar coordinates First "J" mission (expanded science operations, use of a lunar rover, extended lunar stay, expanded CM science

operations) Connection to Lockheed Martin/ULA: The contributions of our heritage companies to the Apollo program were listed in the MARS STAR article about Apollo 11 in 2019. This mission used the ALSD (Apollo Lunar Surface Drill), designed and built by Martin Marietta in Denver. The drill never functioned as intended on this mission.



Apollo 15 Crew: Dave Scott Commander; Al Worden, CM Pilot; Jim Irwin, LM Pilot Photo Credit: NASA

A Hot Monday Morning in July, 1971 – A Personal Reminiscence

Just after dawn on Monday, July 26, 1971, I was abruptly awakened by the sound of loud engines. Disoriented, I slowly moved around, realizing that I was laying down on the back seat of our family car. My Mom, in the front seat, woke up and asked loudly, "What is that sound? Did we miss the launch?" My dad was outside with a borrowed sleeping bag from a neighbor parked next to us and he was also getting up, wondering what was going on. Everyone was awake now – the loud engine sounds were from two crop dusting planes releasing mosquito repellents over the large crowds parked or camping alongside the Indian River near the town of Titusville, Florida. Across the river, launch pad 39-A and the beautiful Saturn V were still lit by huge spotlights as the dawn approached. Radios came on, affirming that the launch of Apollo 15 was on schedule for liftoff at 9:34 am EDT, the weather looked good, and no technical issues were being worked. Many of us walked over to the river's edge nearby and looked at the towering Saturn V in the distance, realizing that the crew was likely already on board or on its way to the pad.

Over one million spectators were lining the streets and roads, both within KSC/CCAFS and in places like Titusville, one of the largest crowds since the Apollo 11 launch in 1969. We had scouted out places to park for the launch a few days prior to launch day, driving all the way up to the Cape from Pompano Beach, Florida, where we were staying at a small beach resort. On that visit, we also did the bus tour at KSC, getting a close look at the Saturn V on LC-39A (sadly, I could not find the pictures). I drained my dad's wallet at the souvenir shop at the visitor's center (much smaller than the shops there now), collecting everything I could get my hands on for the Apollo 15 mission. We drove all the way back to Pompano Beach (my dad drove 400 miles that day), tired but excited about the events that were coming in a few days. On the day before the launch (Sunday, July 25), we got up at 4:00 AM, having packed the car the night before, and headed north again, arriving in Titusville and scoring a parking spot for \$20-my dad was outraged by that cost-at a little park area on the south end of town, not far from where the NASA causeway joins Highway 1. We were allowed to leave the parking spot to go to restaurants for meals and to the displays that were in the shopping mall nearby. That evening, everyone in that dirt parking area made lots of friends as we were all watching the activity directly across the river. We retired to the uncomfortable car seats and a borrowed sleeping bag and tried to get some rest.

Back to the morning of the launch: everyone was buzzing about the crop duster planes and the imminent launch. An entrepreneurial person nearby in the parking area was selling cinnamon rolls and doughnuts and the coffee was extremely popular with the adults. Our parking area also had port-a-potties for the "important" stuff (probably justifying the \$20 fee). The sun had risen, and the temperatures started to climb—Florida in July—and we all found places to sit along the Indian River on the ground; a few smart people had chairs or were sitting on the roofs of their cars if they were closer to the river. Of course, several people had radios and even a few small portable TVs. I was bursting with energy and nervousness, clutching my small Kodak Instamatic camera, and shading my eyes from the sun.

The countdown continued. At T-8 seconds, the five F-1 engines of the Saturn V were ignited with their combined thrust of 7.6 million pounds, and the exhaust plumes extending a long way on either side of the launch pad. For the observers across the Indian River, this was a silent event except for cheers and "aahs" of the crowd, as the sound of ignition had not traveled that far yet. At T-0, the huge rocket began its slow climb away from the pad and then the sound hit us in waves!! I was crying and trying to watch and take pictures with my tiny camera all at the same time, while the noise and vibrations shook me and the ground beneath me. I have never heard or seen anything like that since, in the many years of watching Titan, STS, Atlas, Delta and other launches. Those subsequent launches were always impressive, but the Saturn V was in another class. Apollo 15 headed downrange and we were able to see and cheer Stage I/II separation.

The launch was over, a most astonishing experience for everyone gathered there. Mom, Dad and I headed back to the car, laughing at people scrambling to get out and get to the major highways. My dad took a picture with my Instamatic of a pair of shoes that someone had left behind. We finally got on the road around noon and drove all the way to the Huntsville, Alabama, area that evening. The next day, we toured the Alabama Space and Rocket Center, then continued our drive back to Colorado, taking a few more days to get there. We pulled into the driveway of our home in Aurora on Friday, July 30, about one hour before Falcon separated from *Endeavour* and headed to the lunar surface. I raced inside to turn on the TV and did not leave it verv often over the next week. Now it's time to move into the actual program profile of Apollo 15; most of the profile will be about the excursions done on the moon.

Apollo 15 Heads to the Moon

Apollo 15's launch was in a more southerly direction because of the extra weight on-board, resulting in a lower park orbit of 90 nautical miles. The Lunar Module (LM) *Falcon* on this first J-mission weighed 4,000 pounds more than an H-mission LM because of increased fuel and oxidizer tank sizes, added science experiments and instrumentation, additional batteries and solar cells, and the 500-lb weight of the new Lunar Rover Vehicle (LRV), built by Boeing.

At 11:36 minutes into the mission, the S-IVB engine shut down, leaving Apollo 15 in their low orbit. The engine fired again at 2:50:02 into the mission, setting Apollo 15 on its TLI (trans-lunar injection) trajectory towards the moon. The S-IVB stage was jettisoned and impacted the moon about an hour after the crew arrived in lunar orbit. The crew, with Commander Dave Scott, LM Pilot Jim Irwin, and CM Pilot Al Worden, were pleased with the booster performance and they had a nominal LM extraction and docking. Scott was the only veteran astronaut in the group and his first mission (Gemini 8 with Neil Armstrong) was shortened significantly when their spacecraft started spinning uncontrollably after docking with an Agena upper stage due to an RCS thruster failure. He also served as the CM pilot on the Apollo 9 mission in March, 1969. Irwin and Worden were rookies and all three were in the Air Force; coincidentally, all three also attended the University of Michigan for engineering studies.

Arrival at the Moon; *Falcon* to the Surface

After having only minor technical issues on the way to the moon and only requiring two course corrections (four had been planned), Apollo 15 performed a successful SPS (Service Propulsion System) burn on the far side of the moon and entered lunar orbit on July 29. The SPS then performed a descent orbit insertion burn of 24.53 seconds, with both craft now in a much lower orbit of 58.5 by 9.6 nautical miles. As the crew rested, Mission Control noted that the orbit was becoming increasingly elliptical due to mass concentrations on the lunar surface, so corrections were made with the RCS thrusters on July 30 before separation.

Falcon separation was attempted at 100:15:36 mission elapsed time but was unsuccessful; this was due to a loose instrumentation umbilical that was fixed, and separation was successful 25 minutes later. CM pilot Worden executed an SPS burn to raise the orbit of Endeavour to prepare for his scientific work. Falcon began its descent at a slightly higher altitude than planned; the crew could not see surface features initially because of the LM descent attitude, but a pitch-over event allowed them to see the surface in front of them. Commander Scott did not recognize any features from training and was concerned they would overshoot the intended landing site, but he finally recognized the Hadley Rille and began the maneuvering to try and target the planned landing site. The larger engine bell on this J-Mission LM descent stage kicked back so much dust that the surface was invisible; the very second LM Pilot Irwin called "Contact," Scott shut off the descent engine, leading to a hard drop to the surface because they feared reflective energy from the engine would damage the LM structure. Falcon was near a small crater and leaning back at an angle of 6.9 degrees and to the left at 8.6 degrees, still below the maximum acceptable tilt angles; they were also over 2,000 feet from the desired landing site, but that was irrelevant with the ability to use the rover.

Stand-Up EVA; EVA-1

After landing, a sleep period was scheduled for Irwin and Scott, as their first EVA was planned to be seven hours long. Scott was concerned about the landing site and clearances, so they got permission to put on their spacesuits, depressurize the LM and remove the top hatch and docking mechanism. Scott stood on top of the ascent engine cover and put his head outside. He did a 22-picture stereo panorama and other photos of the terrain and was relieved to see that clearances were quite good, with no huge boulders nearby to impede the rover. Thirty minutes after opening the hatch, Scott reentered, closed the hatch and *Falcon* was repressurized.

While Irwin and Scott slept, the pressure inside the descent engine oxidizer tanks slowly dropped; the low-speed telemetry during the night mode made it difficult to understand the cause, but Mission Control was unwilling to wake the crew. Finally, the crew was awakened one hour early, and they transitioned to high-data-telemetry. This revealed that the valve of the urine transfer device was open even though the receptacle was capped, resulting in a loss of about 8 pounds of oxygen (out of 95 total pounds, with half of that being reserve). Scott and Irwin noted in the post-flight debrief that Mission Control should have awakened them as soon as the leak was detected.

Now that the crew was awake, they started preparations for the first lunar EVA. Those preparations took four hours before Mission Control gave the GO to depressurize the LM. Scott backed out of the LM, came down the stairs, and became the seventh man on the lunar surface. His words: "As I stand out here in the wonders of the unknown at Hadley, I sort of realize there's a fundamental truth to our nature. Man must explore. And this is exploration at its greatest." Irwin joined him a few minutes later and they spent some time setting up the new and improved television camera to monitor the deployment of the rover. Irwin also collected a contingency sample in case they had to evacuate the surface in a hurry.

The LRV deployment was relatively easy, using a system of lanyards and pulleys, with most of the deployment being automatic. Let's briefly explore the rover development and design:

Overview – Lunar Rover Vehicle

Boeing won the LRV contract in October, 1969, beating out Bendix, Grumman and Chrysler. A major subcontractor was General Motors Defense Research Laboratories in Santa Barbara, California. Boeing used facilities in Seattle and Kent, Washington, and Huntsville, Alabama, for design, build, integration and test. Four LRVs were built, and development only took 17 months; the LRV proved to be very reliable, safe, and flexible during lunar operations.

The LRV had a mass of 460 pounds and could hold a payload of 1,080 pounds (astronauts in full suits, tools, and collected samples). Built using aluminum alloy tubing for the frame, the LRV had side-by-side seats of

tubular aluminum with nylon webbing. The wheels were unique designs by GM and were called "resilient" wheels; they used aluminum hubs and tires with zinccoated steel strands, along with titanium chevrons on the wheel/surface contact area to provide traction. Each wheel had its own electric drive, a DC motor capable of 0.25 horsepower and brake system. Overall power was provided by two 36-volt silver-zinc-potassium hydroxide non-rechargeable batteries, charged to 121 Amp-Hours. The LRV was driven using a T-shaped hand controller and navigation was provided by a directional gyro and odometer. An operational constraint of LRV operations was known as the walk-back limit, based on the consumables in the astronaut suits if the rover failed and the astronauts had to walk back. The rover was always driven to the furthest planned distance first, then returned along a traverse back to the LM. On Apollo 15, the LRV traveled a total of 17.25 miles, with a maximum range from the LM of 3.1 miles and a longest traverse of 7.75 miles.



Configuration of LRV Diagram Courtesy of NASA

Back to EVA-1: After deploying the LRV, Commander Scott took it for a "spin" in the vicinity of the LM. The Commander always drove, while the LM pilot helped with navigation and observations of formations and possible lunar samples. The LRV had no steering from the front wheels (this mysteriously fixed itself after the first EVA), but this did not hamper the excursion. The EVA commenced at a leisurely 6 mph with the LRV, and Scott and Irwin traveled to the base of Hadley Delta via the Hadley Rille (a rille is defined as a fissure or narrow channel on the moon's surface). They were in search of Elbow crater, which would help them establish exactly where they landed using the vector of distance and direction from their starting point.

Arriving at Elbow crater, they took photographs and Scott aligned the S-Band antenna so that Mission Control could operation the TV camera on the LRV. The crew took four samples from Elbow crater in a radial pattern, then moved on to their second station, St. George crater, which was the main objective of EVA-1. St. George crater was supposed to have ejecta that might reveal information about the interior of Hadley Delta, but no ejecta was seen so they decided to move on to a boulder sitting in the open. They took several samples at the boulder, then collected pebbles from the regolith (surface material). At this point, Mission Control was concerned about the time expended so far on the EVA and directed the crew to proceed back to the LM.

Back at Falcon, Scott and Irwin deployed the ALSEP (Apollo Lunar Surface Experiments Package). Scott had difficulties with the drill used to place heat-flow experiment probes. This drill, the ALSD or Apollo Lunar Surface Drill, was built by Martin Marietta and was one of the only contributions by that heritage company to the Apollo program. Mission Control finally told them to call it a day, after 6 ½ hours of EVA. Apparently, during this entire time on the surface, Irwin was unable to get water from his water bag. This extreme dehydration may have been a factor in Irwin's later health issues (four major heart attacks, the last one being fatal), described in his biography in this profile.

EVA-2

The second EVA targeted the Mount Hadley Delta region again. The first stop was at a site named Front. Scott felt the terrain variation was uninteresting, so they continued to another site about 1.9 miles away up the Delta. There they sampled a fresh-looking 3-foot crater and took other samples. Most were the common breccias, but there was one with porphyritic basalt, which was more significant geologically. Both crewmembers benefited greatly from their extensive geology training prior to the mission; CM pilot Worden also had extensive training to help him in feature identification and observation from orbit.

Scott explored a 40-foot crater nearby and a core sample was taken from inside the crater. Returning to the LRV, they drove 650 feet to a large boulder, which had a greenish tinge due to magnesium oxide. Continuing to Spur crater, they found and collected many small fragments on the rim. At this point, they saw what became the most famous lunar sample collected during the entire Apollo program. Sample #15415, a rock weighing 9.5 ounces, became known as the "Genesis Rock;" it was pure plagioclase or Anorthosite (extruded magma). Initially it was thought to be from the Moon's primordial crust, but later it was determined to be about 4.1 billion years old, forming after the Moon's crust solidified. It was still one of the oldest samples obtained on any mission. Later analyses of the oldest lunar rock samples found evidence of water in some of those samples, although this sample did not yield that same evidence. Plagioclase is in the Feldspar

mineral group and is major constituent mineral on Earth, the lunar highlands and on Mars.



Genesis Rock: Sample 15415 Photo Credit: NASA

Time was running out on the walk-back constraint, so the crew was ordered to collect many small fragments from that same area. They returned to *Falcon* along the same path. At a crater known as Dune, Scott stopped the LRV long enough to collect samples from the area, including from a large basalt rock. Back at the LM, the drilling continued for the heat-flow experiment, but the ALSD would not penetrate more than a few inches before getting stuck. A post-flight analysis found that the drill design was flawed, with the flutes too close together at the joint joining the sections of the stem. A few other experiments were attempted, including an unsuccessful core sample, and the last task of the day was to set up the American flag. The crew had been outside *Falcon* for 7 hours and 12 minutes.



LM Pilot Jim Irwin Salutes the American flag on the Moon (Falcon and LRV in background) Photo Credit: NASA

EVA-3

This third EVA was originally intended to traverse to an area known as the North Complex. This was canceled

so that the crew could spend more time on trying to extract the core sample. Irwin and Scott slowly managed to work the sample out of the ground, finally retrieving a 7.9-foot sample that had 50 distinct layers. The crew continued to fix problems with the LM static TV camera, then made a film of the LRV in action and then finally set off for Hadley Rille. They arrived at a 50-foot crater near their original target area and decided it met the objective, stopping to collect samples. The regolith was extremely soft and turned out to be among the youngest (newest) material walked on by an astronaut on the moon. They continued to the Rille with an objective to sample exposed bedrock; this was attempted in a couple of areas. This also led to the retrieval of a huge basalt rock dubbed "Great Scott," weighing 21 pounds.

Traversing back to the LM, Scott performed the Galileo experiment with a hammer and a falcon feather, demonstrating that the gravity field of the moon, unhampered by atmospheric drag, would cause the same acceleration in the two bodies and they would reach the surface at the same time. The experiment was a success; Scott then drove the rover about 300 feet from the LM so that its camera could observe the ascent stage lift-off. He placed a small Bible on the hand controller and then walked to a small hollow where he placed a plaque bearing the names of the fourteen astronaut and cosmonaut fatalities known at that time in 1971. The plaque was accompanied by a Fallen Astronaut statuette (a matter of some controversy after the mission). Scott and Irwin were outside the LM for 4 hours and 50 minutes on EVA-3.

Endeavour in Orbit

After Falcon departed for the lunar surface, Worden took the CSM to a higher orbit. *Endeavour* was designed with an upgraded Scientific Instrument Module (SIM) bay that had a door that could be jettisoned (that occurred during the translunar coast). The SIM contained a gamma-ray spectrometer and laser altimeter, a mapping camera, and a panoramic camera. Many of the instruments caused difficulties during assembly, integration and test before the launch. Also present were an alpha particle spectrometer and a mass spectrometer, located on a boom. Worden had difficulty with the booms during his scientific observations (an artifact of testing on Earth that could not fully simulate space conditions), but many photographs and analytical data were obtained. A Particles and Fields Subsatellite was released from the SIM bay into lunar orbit after the *Falcon* crew returned; this satellite operated for 17 months, returning data about plasma and energetic particle interactions and mass concentrations on the lunar surface.

Worden also did exercises to ensure he retained muscle integrity and he greeted NASA after emerging from the far side of the moon in different languages. Worden was in orbit alone for nearly four days. Just before Falcon left the surface, he had to perform an 18-second SPS burn to correct for drift over the launch site.

Falcon Departs the Moon; Return to Earth

The ascent stage of Falcon departed the moon at 17:11:22 GMT on August 2 after 66 hours and 55 minutes on the lunar surface. The camera on the LRV captured the launch and the Air Force theme played as they rapidly ascended (fed from Endeavour through Mission Control). Two hours later, Falcon docked with Endeavour, equipment and samples were transferred, and the LM ascent stage was jettisoned and intentionally crashed on the lunar surface. Seismometers left from Apollo 12, 14 and 15 picked up the impact. During the EVAs on the surface, doctors had noticed irregularities in both Scott's and Irwin's heartbeats but did not inform them (Scott was not happy about that decision). As noted earlier and in Irwin's biography, he had several serious heart problems after returning and died in 1991 of a heart attack. The doctors theorized they had both suffered from potassium deficiency due to the hard work on the surface.

The crew spent two more days in orbit around the moon, doing more observations and releasing the subsatellite. On August 4, at 21:22:45 GMT, the SPS engine burned for 2 minutes and 21 seconds, sending the crew into a trans-earth trajectory. The next day, Worden performed a 39-minute EVA at approximately 171,000 nautical miles from Earth to retrieve the film canisters in the SIM. Endeavour approached Earth on August 7, jettisoning the service module and re-entering Earth's atmosphere. One of the main parachutes failed after deploying, but only two were required for a safe splashdown. The crew were recovered by the USS Okinawa after a phenomenally successful mission lasting 12 days, 7 hours, 11 minutes, and 53 seconds. At home, I was so, so happy after seeing the launch and then sharing in the exploits of the crew on the lunar surface (some of those EVAs were after a proper bedtime, but my folks were indulgent and let me watch as much as possible on my summer break). This mission did result in an increase in interest in the Apollo program, primarily due to the interesting scenery at the landing site and the use of the LRV. Sadly, none of the crew ever flew again due to a controversy with a deal they made to carry (without NASA's knowledge) first day covers that they would bring back and sell to fund their children's education. The Fallen Astronaut statue that Scott left on the moon was supposed to be the only version, but the artist tried to sell limited editions of the statue, causing another controversy. The crew was reprimanded, although they did get a partial exoneration after a successful lawsuit by Al Worden and the covers were returned to them.

The first J-mission was a resounding success and NASA now turned to two more J-missions on the manifest: Apollo 16 and Apollo 17. These two missions, which launched in 1972, will be profiled in future MARS STAR editions, coinciding with their 50th anniversaries.

David R. Scott Biography

David R. Scott was born in San Antonio, Texas, on June 6, 1932. His father, Tom William Scott, was a fighter pilot in the Army Air Corps during WWII and rose to the rank of brigadier general; Scott recalls him as being a strict disciplinarian. Young David was sent to a military institute during the three years his father served in the war. By the time his father returned, he was very interested in aviation and was able to go up in military aircraft with his father. Although Scott wanted to attend West Point, he was unable to get an appointment, so he attended the University of Michigan on a swimming scholarship. In the spring of 1950, he received and accepted an invitation to attend West Point, primarily due to his swimming prowess. When Scott graduated from West Point in 1954, he volunteered to be commissioned in the Air Force (the USAF Academy opened that year), graduating 5th out of 633.

Scott did pilot training at Marana Air Base in Arizona, then went through additional training at other US Air Force bases before being posted to the 32nd Tactical Fighter Squadron in the Netherlands. Hoping to pursue a career as a test pilot, he was advised to get a graduate degree, so Scott enrolled at MIT and received a Master of Science Degree and the degree of Engineer in Aeronautics /Astronautics in 1962. He was chagrined when he was ordered to the USAF Academy to be an instructor and found a sympathetic ear at the Pentagon. His orders were changed to report to the USAF Test Pilot School at Edwards, under the command of Chuck Yeager. He was selected for the Aerospace Research Pilot School, flying high-altitude missions.

In 1963, Scott applied to be part of the third group of astronauts. He intended this to be a temporary detour from his military career. He was accepted and assigned to MIT to supervise the development of the Apollo Guidance Computer. He also served as CAPCOM for the Gemini IV and V missions. He was selected by Deke Slayton as a crew member on Gemini VIII with another space flight rookie Neil Armstrong, impressing other members of the Group 3 astronaut corps, as he had not served as a backup on any missions. The Gemini VIII mission attempted the first docking with the Agena upper stage. The two spacecraft began spinning after the docking and the crew, out of communication range with Mission Control, worked to immediately undock. The Gemini spacecraft began rotating much faster and Armstrong used the RCS (Re-entry Control System) thrusters to stop the tumble. In the mission rules, this use of the RCS required an immediate abort of the mission, necessitating a splashdown in the north Pacific. The main thruster failure was attributed to an electrical short.

Scott was assigned as a backup crew member for Apollo 1 and he and the other crew members spent much of their time at the North American Rockwell plant in Downey, California, supervising the build of the CSM for that mission. In the interim, the Apollo 1 fire took the lives of the primary crew on January 27, 1967 and Scott was assigned to a team to help redesign the CM hatch. He was then assigned to Apollo 8, but that mission was changed and Commander Jim McDivitt preferred to wait for the Apollo 9 mission, testing the LM and CM in earth orbit. Scott followed McDivitt to the Apollo 9 mission as CM pilot. He had extensive responsibilities on that mission that performed rigorous tests and rendezvous and docking maneuvers of the LM and CM.

Scott was named the backup commander of Apollo 12, along with Irwin and Worden as the other backup crew. This put them in line to be the prime crew for Apollo 15, which was publicly announced on March 26, 1970. After returning from that mission, the first-day cover scandal broke. Scott was assigned as a special assistant on the Apollo-Soyuz Test Project. He did work on this project in Moscow and became friends with Alexei Leonov. In 1973, Scott was offered the job as deputy director at Dryden Flight Research Center, then he became the Center Director (a civilian role, requiring him to retire from the USAF). He retired from NASA in 1977. After NASA, his career included business projects and consulting work; he had a lucrative career working with Hollywood on various space films, including Apollo 13 and the HBO miniseries From the Earth to the Moon; he also worked with the BBC on reporting and space projects and did a dual biography/history of the space race with Alexei Leonov.

Scott was married twice, first to Ann Ott in 1959 and they had two children. Later, he divorced Ann and married Margaret Black, the former vice-chairman of Morgan Stanley. They currently live in Los Angeles (Scott is still alive as of the writing of this article in August, 2021). Scott was forgiven over time for the first-day cover scandal and he was the recipient of many honors and awards, including being inducted into the US Astronaut Hall of Fame in 1993.

Alfred M. Worden Biography

Al Worden was born in Jackson, Michigan, on February 7, 1932. He was the second of six children and lived on a family farm. He received a one-year scholarship to the University of Michigan, but also applied and was accepted at West Point and at the US Naval Academy. Worden headed to West Point in 1951 and enjoyed the demanding life at that Academy, graduating 47th out of 470 in his class. He chose a commission in the Air Force after graduating, hoping for a faster promotion path. He received flight training at Moore Air Force Base in Texas. He found out he loved flying and worked his way through different aircraft types in different squadrons. In 1961, he asked to advance his career by studying Aerospace Engineering at the University of Michigan, earning Master of Science degrees in Aerospace and Instrumentation Engineering in 1963.

Worden then applied to the USAF Test Pilot School but was not selected. His superiors recommended him for an exchange program with the Royal Air Force in the UK at the Empire Test Pilots School in Farnborough. Returning to the States, Worden served as an instructor at the Aerospace Research Pilot School serving under its commander, Chuck Yeager. Worden applied for the third group of astronauts in 1963, but NASA did not want to interfere with (at that time) his pending orders for Farnborough. In 1966, the fifth group of astronauts was recruited; at the same time, the Air Force was seeking qualified candidates for the Manned Orbiting Laboratory (MOL). Worden felt that the MOL project would never get off the ground (very prescient) and he applied to NASA. At the age of 34, he was one of 19 candidates selected.

His early assignments including working on a team in 1966 headed by Pete Conrad to oversee the design and build of the Block II Command Module, which became the version that flew to the Moon. He was at the North American Rockwell plant in Downey when the fire occurred on the pad on January 27, 1967, killing the crew of Apollo 1. When missions picked up again, Worden was assigned to the support crew for Apollo 9, then was elevated to backup CM pilot for Apollo 12, making him the prime CM pilot candidate for Apollo 15. Worden became life-long friends with Apollo 12 prime CM pilot Dick Gordon, and they worked on contingency techniques so that the CM Pilot could bring a crippled craft home.

In 1970, Worden was picked to be prime crew on Apollo 15. As this mission turned into the first J-mission, Worden's training and responsibilities grew and he spent a lot of time working with the legendary Egyptian-American geologist Farouk El-Baz. He did geology training with the rest of the crew and supervised the construction and testing of the CSM at North American Rockwell. Before the mission, Worden appeared on *Mister Rogers' Neighborhood* to talk about space travel and take questions from the children.

After returning from the mission, where he enjoyed his isolation in orbit around the moon, the first-day cover incident was revealed. At the time, the three members of Apollo 15 were assigned as the back-up crew for Apollo 17. The astronauts were reprimanded and congressional hearings were scheduled (of course). Irwin retired, but Worden was still looking for another job at NASA. Dale Myers, the associate administrator for Manned Space Flight, helped Worden get a position at the Ames Research Center in California. Worden

retired from NASA and the Air Force in 1975, having reached the rank of Colonel.

After retiring, Worden worked to re-establish his reputation with other astronauts through the Mercury 7 Foundation, ran for the House of Representatives from the 12th congressional district in Florida (losing the primary) and sued NASA about the first-day cover situation; NASA conceded the lawsuit and returned the covers to the astronauts in 1983. Worden held various positions with companies before retiring from the business world in 1996. He wrote a fantastic and best-selling autobiography, *Falling to Earth: An Apollo 15 Astronaut's Journey to the Moon*, and accepted most of the responsibility for the first-day cover incident in that book. (I highly recommend this book—very truthful, funny, and well-written.) He also wrote a children's book about space exploration and a book of poems.

Worden was married three times, had two daughters with his first wife Pamela Vander Beek and a stepdaughter from his third marriage to Jill Hotchkiss. He married Vander Beek in 1955 and they divorced in 1969, making him the first astronaut to be divorced before flying in space. Worden died on March 18, 2020, in assisted living, after suffering an infection at home. He received many awards and accolades for his contributions to the Apollo program and is in the Astronaut Hall of Fame.

James B. Irwin Biography/My Remembrances

Irwin was born on March 17, 1930, in Pittsburgh Pennsylvania. His grandparents on his father's side emigrated from County Tyrone, Ireland. At the age of 12, Irwin told his mother that wanted to go to the moon and hoped to be the first (he ended up being the eighth on the lunar surface). He graduated from high school in Salt Lake City and received an appointment to the US Naval Academy, graduating in 1961. Irwin continued his studies at the University of Michigan, receiving Master of Science degrees in Aeronautical and Instrumentation Engineering. Irwin moved to the Air Force, receiving initial flight training at Hondo and Reese Air bases. He graduated from the Air Force Experimental Flight Test Pilot School in 1961 and the Aerospace Research Pilot School in 1963. Prior to joining NASA, he was chief of the Advanced Requirements Division at the Air Defense Command and received numerous citations.

Irwin was a developmental test pilot for the Lockheed YF-12 (Mach 3 fighter-interceptor and precursor to the SR-71). A student pilot that Irwin was teaching in 1961 crashed their plane, resulting in numerous injuries to both; Irwin had compound fractures, amnesia and nearly lost a leg but for the skills of an Air Force orthopedic surgeon. Irwin applied to NASA and was selected in the group of 19 astronauts in 1966 (same group as Worden). He worked on a team performing environmental qualification testing of the Lunar Module, then was assigned to the support crew of Apollo 10. Irwin was back-up LM pilot for Apollo 12, leading to his assignment on the primary crew for Apollo 15.

After the Apollo mission, Irwin resigned from the Air Force and NASA following the reprimands for the firstday cover incident. While on the Moon, Irwin had a spiritual epiphany and felt the presence of God. He and his wife became born-again Christians and started a ministry known as the High Flight Foundation, which was based in Colorado Springs at that time. Irwin's health was never the same after Apollo 15. In fact, the arrythmia he suffered from on the Moon was considered very serious by Mission Control and they were concerned he had a heart attack at that time. He suffered three heart attacks, starting two years after returning (resulting in a triple-bypass) and finally culminating in his death from a fourth heart attack on August 8, 1991, making him the first moonwalker to pass away. He and his second wife, Mary Ellen Monroe, were married in 1959 and had five children. Irwin wrote several books and did expeditions trying to find Noah's Ark on Mount Ararat. He is in the Astronaut Hall of Fame.

In 1973, I was a freshman struggling (like most of us did) through the basic classes in Electrical Engineering at the University of Colorado in Boulder. I read that Jim Irwin had published an autobiography of his experiences on the Apollo 15 mission and his deep Christian belief. I called my parents in excitement because Irwin was going to sign the book at a Bible bookstore in Aurora. My Dad went and got a signed copy of "To Rule the Night: The Discovery Voyage of Astronaut Jim Irwin" (I was deep into my second semester, so I couldn't skip classes) and talked to Irwin about my interests and our viewing of his launch in 1971. He gave Irwin our home address. During my sophomore year, I received a short letter from Irwin at the High Flight Foundation telling me that he was doing a presentation at the Engineering school in Boulder about the Apollo 15 mission. My parents came up and we attended the presentation together; I introduced myself and my parents to Irwin after the presentation (he remembered my dad) and we started a real correspondence after that point. He wrote me four or five letters encouraging me in my Engineering studies and I wrote right back, asking him questions and getting advice. It was a wonderful followon to have this mentoring after seeing the launch of Apollo 15. Sadly, I have looked in about every storage box in our house and have not found those letters or my pictures of the launch. I will have to be content with the memories and my eternal gratitude to my late parents for taking me to see the launch.

Resources and Links

Apollo Flight Journal: <u>https://history.nasa.gov/afj/</u>

<u>To Rule the Night: The Discovery Voyage of Astronaut</u> <u>Jim Irwin</u> - Irwin, James B & Emerson, William A. Jr., Published by A.J. Holman, 1973 – Available at Amazon and secondary markets

Falling to Earth: An Apollo 15 Astronaut's Journey to the <u>Moon –</u>Worden, Al & French, Francis, published by Smithsonian Books, 2012 – Available at Amazon and Smithsonian books

Apollo 15 Mission report:

https://www.nasa.gov/mission_pages/apollo/missions/a pollo15.html

Wikipedia: Astronaut Biographies, general overviews of the mission:

https://en.wikipedia.org/wiki/Apollo 15

On This Date in History

This section has milestones retrieved from publicly available information for LM, ULA and heritage programs from 10 to 60 years ago (2011, 2001, 1991, 1981, 1971, 1961). Delta launches prior to the formation of ULA, unless it included an LM or heritage company payload or upper stage, are not listed. No classified programs are identified, even if the program is now considered unclassified, except for the Discoverer program (Corona). The events reflect milestone activity in the quarter before the release of the MARS STAR-where appropriate, key press releases are also included; significant milestones are in bold. The list is not intended to be all-inclusive due to historical record inaccuracies. Occasionally, a major space milestone not accomplished by any of our heritage programs will be included due to its significance.

Events in July (10 to 60 years ago)

- 07/08/2011: STS-135 (*Atlantis*) launched, LC-39A, KSC; 4-person crew, Raffaelo MPLM for ISS; Last STS flight
- 07/15/2011: GPS-IIF-2 launched by ULA Delta IV-M+ (4/2), LC-37B, CCAFS
- 07/12/2001: STS-104 (*Atlantis*) launched, LC-39B, KSC; 5-person crew, ISS assembly/components
- 7/23/2001: GOES-12 launched by LM Atlas IIA, LC-36A, CCAFS
- 07/29/1991: Lockheed UGM-133 Trident D-5 (four) launched, USS *Pennsylvania*, ETR
- 07/11/1981: Lockheed UGM-73 Poseidon C3 (four) launched, USS *George C. Marshall*, ETR
- 07/16/1971: Classified launched by Thorad SLV-2H Lockheed Agena-D, SLC-1W, VAFB
- 07/26/1971: Apollo 15 launched, LC-39A, CCAFS; first use of Lunar Roving Vehicle and First J-Mission; Subject of the Program Profile in this edition of the MARS STAR History Corner

- 07/01/1961: MM MGM-31 Pershing 1 launched, LC-30A, CCAFS
- 07/07/1961: GD SM-65E Atlas launched, LC-13, CCAFS
- 07/07/1961: Discoverer 26 launched, Thor DM-21, Lockheed Agena-B, LC-75-3-5, VAFB
- 07/12/1961: RCA Tiros-3 (Tiros-C) launched by Thor DM-19 Delta, LC-17A, CCAFS
- 07/12/1961: MIDAS-3 launched by GD Atlas LV-3A Lockheed Agena-B, LC-1-2 Point Arguello; maiden flight of Atlas LV-3A Lockheed Agena-B
- 07/13/1961: Lockheed UGM-27 Polaris A2 launched, LC-29A, CCAFS
- 07/20/1961: MM MGM-31 Pershing 1 launched, LC-30A, CCAFS
- 07/21/1961: MM HGM-25A Titan I launched, LC-20, CCAFS
- 07/21/1961: Mercury-Redstone 4 (Liberty Bell
 – Gus Grissom) launched, LC-5; spacecraft sank
 during recovery operations. Second manned US
 spaceflight; significant space milestone
- 07/21/1961: Discoverer 27 launched by Thor DM-21 Lockheed Agena B, LC-75-3-4, VAFB; LAUNCH FAILURE
- 07/25/1961: MM HGM-25A Titan I launched, LC-19, CCAFS
- 07/31/1961: GD SM-65E Atlas launched, LC-11, CCAFS

Events in August (10 to 60 years ago)

- 08/05/2011: LM/NASA Juno Spacecraft launched (mission to Jupiter) by ULA Atlas V 551, LC-41, CCAFS
- 08/06/2011: LM BSAT-3c/JCSAT-110R launched on Ariane 5 ECA, ELA-3, Kourou, French Guiana (also launched Astra 1N satellite).
- 08/06/2001: DSP-21 launched by LM Titan IVB (402)/IUS, LC-40, CCAFS
- 08/08/2001: LM Genesis launched by Delta II 7325-9.5, LC-17A, CCAFS; Genesis parachute failed to deploy on September 8, 2004, but samples were obtained (PARTIAL SPACECRAFT FAILURE AT RETURN)
- 08/10/2001: STS-105 (*Discovery*) launched, LC-39A, KSC; 7-person crew, ISS assembly, Leonardo MPLM
- 08/02/1991: STS-48 (Atlantis) launched, LC-39A, KSC; 5-person crew, TDRS-5 deployment
- 08/30/1991: Lockheed UGM-133 Trident D-5 launched, USS *Kentucky*, ETR
- 08/06/1981: FLTSATCOM 5 launched by GD Atlas SLV-3D/Centaur-D1AR, LC-36A; LAUNCH FAILURE, Payload Fairing collapsed
- 08/13/1981: Lockheed UGM-96 Trident 1 C4 (four) launched, USS *John C. Calhoun*, ETR
- 08/22/1981: Lockheed UGM-73 Poseidon C3 launched, USS *Nathanael Greene*, ETR
- 08/28/1981: Lockheed UGM-96 Trident 1 C4 launched (four), USS *Simon Bolivar*, ETR
- 08/07/1971: Multiple technology demonstration satellites launched, GD Atlas E/F, BMRS-A2, VAFB

- 08/12/1971: Classified launched by Titan III (24)B, SLC-4W, VAFB; maiden flight of Titan III (24)B
- 08/02/1961: Lockheed UGM-27 Polaris A2 launched, LC-29A, CCAFS
- 08/04/1961: Discoverer 28 launched, Thor DM-21 Lockheed Agena-B, LC-75-3-4, VAFB; LAUNCH FAILURE
- 08/04/1961: MM HGM-25A Titan I launched, LC-20, CCAFS
- 08/09/1961: GD SM-65F Atlas launched, LC-13, CCAFS; maiden flight of Atlas F
- 08/10/1961: MM MGM-31 Pershing 1 launched, LC-30A, CCAFS; LAUNCH FAILURE
- 08/12/1961: Lockheed UGM-27 Polaris A1 launched (six); USS *Abraham Lincoln*, ETR
- 08/18/1961: Lockheed UGM-27 Polaris A2 launched, USNS Observation Island, ETR; LAUNCH FAILURE
- 08/22/1961: MM MGM-31 Pershing 1 launched, LC-30A, CCAFS
- 08/23/1961: GD SM-65D Atlas launched, LC-576B-3, VAFB
- 08/23/1961: Ranger 1 launched by GD Atlas LV-31 Lockheed Agena-B; PARTIAL FAILURE OF AGENA
- 08/30/1961: Discoverer 39 launched by Thor DM-21 Lockheed Agena-B, LC-75-3-4, VAFB

Events in September (10 to 60 years ago)

- 09/10/2011: LM/NASA GRAIL A/B launched by ULA Delta II 7920H, LC-17B, CCAFS; last launch of Delta II heavy, last launch from LC-17
- 09/08/2001: USA-160 and 160-2 launched by LM Atlas IIAS, SLC-3E, VAFB
- 09/30/2001: Four technology demonstration satellites launched by LM Athena I, Kodiak LP-1, Alaska; last flight of Athena I; first orbital launch from Kodiak
- 09/12/1991: STS-48 (Discovery) launched, LC-39A, KSC; 5-person crew, UARS deployed
- 09/17/1991: MM LGM-118 Peacekeeper launched, LF-01, VAFB
- 09/03/1981: Classified launched by MM Titan III(32)D, SLC-4E, VAFB
- 09/22/1981: MM MGM-31A Pershing launched (two), Fort Bliss
- 09/29/1981: MM MGM-31A Pershing launched (two), Fort Bliss
- 09/01/1971: LAR-2 launched by GD Atlas E/F, BMRS A-1, VAFB
- 09/10/1971: Classified launched by Thorad SLV-2H Lockheed Agena-D, SLC-3W, VAFB
- 09/07/1961: MM HGM-25A Titan I launched, LC-20, CCAFS
- 09/08/1961: MM HGM-25A Titan I launched, LC-19, CCAFS
- 09/08/1961: GD SM-65E Atlas launched, LC-13, CCAFS; **FAILURE**

- 09/09/1961: Samos 3 launched by GD Atlas LV-3A Lockheed Agena-B, LC-1-1, Point Arguello; LAUNCH FAILURE
- 09/12/1961: Discoverer 30 launched by Thor DM-21 Lockheed Agena-B, LC-75-3-5, VAFB
- 09/13/1961: Mercury-Atlas 4 launched by GD Atlas LV-3B, LC-14, CCAFS (test flight)
- 09/13/1961: MM MGM-31 Pershing 1 launched, LC-30A, CCAFS
- 09/17/1961: Discoverer 31 lunched by Thor DM-21 Lockheed Agena-B, LC-75-1-1, VAFB; SPACECRAFT FAILURE
- 09/23/1961: MM HGM-25A Titan I launched, LC-395A-1, VAFB
- 09/26/1961: MM MGM-31 Pershing I launched, LC-30A, CCAFS
- 09/29/1961: MM HGM-25A Titan I launched, LC-20, CCAFS
- 09/29/1961: Lockheed UGM-27 Polaris A1 launched, LC-25A, CCAFS

Reference websites:

https://nssdc.gsfc.nasa.gov/planetary/chronology.html# 2014 https://en.wikipedia.org/wiki/Timeline_of_spaceflight https://www.ulalaunch.com/missions https://news.lockheedmartin.com/newsreleases?year=2021 https://space.skyrocket.de http: www.astronautix.com

Next Edition

Tune in for a History on the Road edition! In the next MARS STAR, I will explore the Kennedy Space Center and the Cosmosphere (in Hutchinson, Kansas). Coming soon: 60th anniversary of the flight of John Glenn, Apollo 16, 25th Anniversary roundtable of the Titan/Centaur Cassini launch, Apollo 17.

Barb Sande, MARS STAR and MARS Facebook Page Historian. Contact me at <u>barbsande@comcast.net</u> or 303-887-8511 or find MARS Associates on Facebook.

Bridge Club

By Dave & Kathy Martz (martz20@comcast.net)

MARS Bridge is up and going strong! After the Buck Center closed for maintenance, the bridge group came back in September as a **Duplicate Bridge Club**. We would love to have new members join us, so if you're interested in playing bridge with our group, please give us a call. We meet monthly for some fun and good games of bridge! All MARS members and their guests are welcome. We play on the **3rd Friday of each month at the Buck Community Recreation Center in Littleton from 10 AM to 2 PM.** You'll need to pack a lunch, as we stop midday to eat. The club provides the cards and all required items for the games. We also provide coffee, tea, and hot water. There is a small fee for the Buck Center, as well as a small fee to the club (which helps with supplies and the year-end party in December).

We have couples, as well as singles, playing. If you're a single, invite a friend to be your partner. Your partner does not need to be a member of MARS to play.

If you want to join us for bridge or have any questions, please contact any of the following Bridge Club Officers:

Presidents: Dave & Kathy Martz, 303-683-9524 Vice-President: Bill Kacena, 303-973-2685

The 3rd Quarter 2021 winners are as follows:

July 16 (2 ¹/₂ tables)

1st – Bart & Diane Wright 2nd – Dave & Kathy Martz 3rd – Ernie & Cecile Berliner 4th – Mike Davis & Mary Stirling

August - (Buck Center closed for maintenance)

September 17 (5 tables)

N/S 1st – Bill & Mavis Kacena N/S 2nd– Dave & Kathy Martz and Ernie & Cecile Berliner tied E/W 1st– Jack & Margie O'Boyle E/W 2nd– Ed & Laurie Bock

Car Club

By Roger Rieger (<u>rrieger10731@gmail.com</u>) 303-912-6217

Carol Lovelace (cyberbear51@comcast.net) 303-358-7459

Hello fellow MARS Car Clubbers! The summer driving has been spectacular! If you haven't taken the time see the beautiful Colorado fall colors through your windshield, do not let more time pass. Winter, and snow (hopefully) are not far in our future and fall colors will be history!

The Car Club met several times at the Cars and Coffee events held the first Saturday of each month at

Cornerstone Church in Lone Tree. This is a great, lowkey show with lots of cool and interesting cars to see. If the weather continues to be nice we hope to be able to continue showing our cool, MARS Car Club rides into November. Several club members got together July 22 and visited the Rambler Ranch Museum in Elizabeth, CO, with a stop for lunch afterwards at El Abuelo. In August the club held its first cruise and lunch, driving the backroads up to Evergreen Lake, Boettcher Mansion, and then stopping for lunch at the Buffalo Rose in Golden.

The big event for the club was our annual Club Car Show which was held in conjunction with the annual MARS picnic at Clement Park. Seventeen fellow MARS Club members brought out their pride-and-joys to share with the rest of the MARS membership. Monies raised from the show entrance fee will be donated to the US Marines Toys for Tots program. Photos for all these fun car club events can be seen on the MARS Associates website, under the "Car Club" tab.



Overview of Car Show Exhibits

Happy motoring and hope to see you soon at a club event! There is nothing special you need to do to join the MARS Car Club, all it takes is to be a MARS member in good standing, and a desire to have fun! If you are interested in joining the club, please drop either Carol or myself an email, we'd love to have you!



Ford Transit--Mark and Ruth Brown

Dinner Club

By Becky and Gary Englebright englebright@me.com 303-941-3167 (Gary) 303-263-6457 (Becky), and

Anita Kannady

(anitakannady@yahoo.com) 303-794-9210

On a happy note, we did have a wonderful Chinese lunch at Imperial Chinese in September. Considering everything, we had a relatively good turnout and, as always, Imperial provided excellent food. The only thing wrong with the event was that the service was much slower than usual because of staffing shortages.

In all cases, the restaurant staff went out of their way to ensure that all the necessary protections were in place and followed. The good news is that we have not heard that any of the attendees have become ill.

We were supposed to go to Hickory House BBQ in Parker for October and Maggiano's for November. Given the way things have been going with the Delta variant and, since there was so little interest in both, we cancelled these events. We have not made any reservations for the first part of next year. We hope to start up again sometime in the spring when we might be able to find restaurants that have patios/decks where we can sit outside. Details will be coming in future emails and posted on the MARS website as plans are finalized.

A big thank you to everyone for their patience and understanding with the cancellations of the luncheons. If you're reading this and have not been getting an update email from us, it is probably because we don't have an email address for you. If you would like to be added to our email list, you can call or email us your email address. See contact information above. Any email information sent to us will be kept in confidence.

We want to encourage anyone who is interested to join us for any of the luncheons. Please send us an email so that you can be added to our mailing list.

On a different note, we are looking for someone to take over the Dining Club, whether full-time or part-time. It would involve deciding on restaurants, scheduling them, and collecting the money. If you, or anyone you know, is interested, feel free to call or email us.

Golf League By Bo Rodriguez (boandpat@comcast.net) The 2021 MARS golf league season is nearing its completion at the end of October. This year, the MARS golf league increased its membership to 52 paid members. As we have in recent years, all our golf league events were played at Broken Tee Golf Course in Englewood, Colorado. Overall, we have had good weather throughout the season, although July and August presented some hot days and some smoky haze from the fires from other western states.

We had our annual two-day league championship tournament on August 12th and August 19th at Broken Tee. The combined net score of the two rounds determined the overall winners as:

1st place – Don Johnson - net score 137 2nd place – Ken McDowell - net score 146 3rd place – Andy Munoz - net score 147* 4th place – Don Norgaard - net score 147 5th place – John Alfeld - net score 148* 6th place – Terry Graber - net score 148 *Last nine holes on 2nd day score determines tiebreaker.

Closest to the pin:

August 12^{th -} hole #5 – Bob Sedar hole #7 – Ken Baier hole #10 – Terry Graber hole #17 – Allen Sanders

August 19th - hole #5 – Martha Lell hole #7 – Rick Loman hole #10 – Andy Munoz hole #17 – Loren Schuessler

Medalist Winners – Paul Boykin with the lowest gross score of 168.

This year there were no holes-in-one made thus far in league play. Therefore, our hole-in-one pool is up to \$230.

I want to give my thanks and appreciation to several of our members who volunteered their time as co-chairs for each event to make this season a success. Special thanks to Tom Ripper for orchestrating the use of the Golf Genius system for scheduling tee times and posting golf scores for our league. Tom also served as one of the Event Managers along with Bob Knickerbocker, Terry Graber and Ken McDowell in managing the weekly scheduling and scoring activity. Thanks also to Tom Cooke our Treasurer for managing our banking account. A big thanks to Don Johnson who assisted in the Vice-President's role. Don Purkey, if you read this, the MARS Golf Club wishes you a complete recovery from your summer long-illness and rehabilitation ordeal. Your leadership contributions are surely missed, and we will see you back next spring in full swing.

For those MARS Associate members that are interested in joining our golf league next season, please check into our MARS website: <u>https://www.marsretirees.org</u> and click on "Golf" in the Clubs listing section. Each year in the month of March the MARS Golf League has its Kick-off Meeting. The announcement for next year's event is forthcoming.

Hiking Club

By Sue Janssen (<u>susan.g.janssen@gmail.com</u>)

Time to go to the high-country and enjoy fall hikes before the snow flies!

Our August hike was organized by Sue Janssen to Square Top Lakes above Guanella Pass. The skies were fairly clear of smoke and clouds and the wind was calm. The trail starts at about 11,600 ft. but drops to cross a stream and pass through the willows. Then it is a steady ascent through alpine meadows to a good resting rock for sweeping views of Mount Bierstadt and the Sawtooth Ridge. As we were sipping water and nibbling snacks, two young men came down the trail carrying heavy packs and snorkeling gear!?!? We politely asked why they were so heavily equipped. They explained Colorado Parks and Wildlife are monitoring the lakes for whirling disease. The whirling disease parasite has a two-host life cycle, alternating between a small worm and a fish. Without these two hosts, the parasite cannot complete its life cycle and will die without multiplying. All the trout have been removed and biologists periodically go for a swim in the alpine lakes to test for the existence of parasites in the worms.



Learning about effort to eradicate whirling disease in high-country lakes. Tyler Swarr--Aquatic Biologist, Lee Janssen, Bob & Debbie Adamoli, Jeff Schnackle, Val Gregory, Anne Herrington, Al McKinney. Don Foley not pictured. Photo by Sue Janssen

After our break, we continued up the trail to Lower Square Top Lake. Some of the group enjoyed another break at the lake and others made the quarter-mile trek to Upper Square Top Lake. Lee Janssen didn't stop there and headed for the summit of Square Top Mountain with an elevation of 13,794 ft.



Upper Square Top Lake Panorama



Lower Square Top Lake with Mount Bierstadt and Sawtooth Ridge across the valley. Photo by Sue Janssen

The return to our cars was speedy, but we still took some time to inspect wildflowers, especially the deep blue Parry's Gentian. We headed to Georgetown and enjoyed lunch and beer at Cabin Creek Brewery before returning to the city.

September is prime leaf-peeping time in Colorado. The third week of September found Ken and Cheryl Marts adventuring to the Western Slope and Carbondale in search of aspen colors. They saw more colors on the east side of the divide than on the western side because they were about a week or two early for McClure Pass and the golden colors it has to offer. But fall colors are ready to pop as evidenced by cooler temperatures at nights and in the mornings. While in Carbondale, Ken and Cheryl journeyed up the 6-mile jeep trail from Marble to Crystal and the Crystal Mill. It's a slow journey but well worth the scenery and the iconic picture at the end.



Historic Crystal Mill. Photo: Ken Marts

September's hike was a stroll up the Abyss Trail off Guanella Pass Road on Thursday, 9/23. Timed to coincide with the aspen color peak for the area and allow for lunch at the Shaggy Sheep in Grant (they're closed Tuesdays and Wednesdays), the off-schedule day resulted in just a few MARS hikers.



Autumn color at the 2-mile mark. Photo credit: Val Gregory

We were amply rewarded when the color became visible at around the 2-mile mark. The ridge to the west was glorious in Colorado's cathedral of gold, orange, and red.



Lenny and Jill Demchek, Val Gregory Photo credit: Sue Janssen

The well-traveled trail was lined with lovely aspen in their best fall colors.



Aspen in their best fall colors. Photo: Val Gregory

Just shy of our agreed-upon turn-around time, Sue and Lenny noticed a small pond on the west side of the trail, and we were treated to a Monet watercolor of a leafdappled pond reflecting the colors of the trees around and the ridge beyond. After a short break for more photos (WOW!), we aboutfaced to head down the trail to the cars and lunch at the Shaggy Sheep! Cheers!



Hidden pond reflecting the surrounding scene. Photo: Val Gregory

Soon we will be snowshoeing. If you wish to join the MARS Hiking Club, contact Sue Janssen at susan.g.janssen@gmail.com who will add you to the club distribution list. Please provide your email address, home phone and cell phone for the roster. The schedule of hikes is posted on the MARS website (http://www.marsretirees.org/). Even if you have never gone snowshoeing or hiking you are welcome to join in the fun. Happy trails!



Photography Club

By John Chapter johnchapter@msn.com 303-986-8277

The last MARS Photography meeting was virtual, using the Zoom program on September 9, 2021. Tom Frickel

presented a program of a hiking backpack trip to Canada. The unusual surprise was that the Tom's hiking trip was about *fifty years ago*. The presentation was a well-enjoyed trip down memory lane for the photo-club members. Photo club members enjoyed the excursion and we all thought that everything seemed indeed like it was 50 years ago! Perhaps, though, this may have been in our minds only! Still, quite the adventure.

Our MARS Photography Club meeting on October 14, 2021, featured a professional photography DVD presentation. Most of our selected professional DVD presentations are by National Geographic.

Before the COVID-19 pandemic we met at the Littleton Public Library (Bemis) for many years and since September 20, 2020, all our meetings have been virtual. We checked with the Littleton Library—they will not host any in-person meetings for rest of 2021. We will continue using Zoom until further notice. We all are looking forward, hopefully, not too far in the future, to restart in-person meetings.

Interested new MARS Retirees members are encouraged to give us a try at one of our virtual meetings. Please check the MARS Retirees Website for the latest Photo Club meetings.

Thanks, and regards, John Chapter and Jim Kummer MARS Retirees Photo-Club

Colorado Springs Lockheed Martin Retiree Group News

By Doug Tomerlin (dougincs@aol.com)

We held a retiree luncheon on Wednesday, August 25th, at Cheddar's Scratch Kitchen in Colorado Springs. Fortytwo attended the luncheon with quite a few attending with their spouse or significant other. Due to the COVID-19 virus, it was November, 2019, since our retiree group held a luncheon. The group was honored to have in attendance Dick Sosnay, the president of MARS Associates retiree group in Denver and Mike Carroll, Vice President of Communications of MARS Associates. Dick addressed the group, discussing the benefits of retirees joining MARS Associates. He provided information packets to those interested in the group.

Group coordinator Doug Tomerlin introduced several first-time attendees. He announced the retirees and spouses who passed away since the last luncheon and held a moment of silence in remembrance. Retirees had a great time at the luncheon with many staying for a long while visiting with other retirees.

We welcome the following retirees who have joined the Colorado Springs Lockheed Martin Retiree Group since the last newsletter:

Rich Carnes Brian Caldwell

We are fortunate, as we know at this point, that no members of our retiree group passed away since the last newsletter.

If you would like more information about the Colorado Springs Lockheed Martin Retiree Group or luncheons, please contact Doug Tomerlin at <u>dougincs@aol.com</u>.

Cape Canaveral News

By Dick Olson (<u>olsons5145@aol.com</u>)

Luncheons

August 2021– A real light turnout this month. Don't know if it was due to my late reminder or the uptick in COVID cases. Present were regulars: Bill Rhode, Abe Smith, Jimmie Weddle and Bob Rodamer. Also joining us was Jack Johnston who was down from Tennessee and we had a good visit. Jack mentioned he was planning to have lunch with Charley Holloway while he was here.

Bill Rhode mentioned that he had run into Jerry Moskovitz at a ham radio club meeting and the Jerry is doing fine and told Bill he would put our luncheon on his schedule so hope to see him back. Still have no news on Larry Gleason.

September 2021–Had a light but little better turnout this month. Present were regulars Bill Rhode, Don Bollinger, Jimmie Weddle, Abe Smith, Bill Masterson, and Bob Rodamer. Couple guys we haven't seen for a while, Larry Gleason and Cecil Snipes, made the scene. Glad to see them back.

Abe mentioned that he had seen a posting on Facebook from Hank Ambrose and that he is slowly making headway following a stroke. Good luck with your progress, Hank, and would sure be nice if you could join us again. We discussed the status of Joe K. and nobody seemed to have any info. Last I heard of him was from Rich Tennis and that was some time ago. Anyone?

Wish everyone a happy Labor Day weekend and stay healthy.

October 2021– A light, but I guess normal, turnout this month. Present were Wendell McDaniels, Abe Smith,

Roger Wright, Bob Matschner, Bob Rodamer, Larry Gleason, Bill Rhode and Don Bollinger.

Roger reported that Ken Webb had suffered a fall and was in the hospital but figured he would be back with us next month and that Lynn Johnson was not quite ready to join us yet.

Wish everyone a happy Columbus Day. Isn't it nice for us retirees to have those long weekends? Also, Halloween is coming up so stay clear of the goblins and stay healthy. See you next month.

Recent Obituaries

Thomas A. Malone, 69, passed away peacefully the morning of July 31, 2021. He enjoyed over 30 years as an electrician assisting with Atlas and Titan launches.

Joe Dean, 90, passed away Aug. 7th. Joe worked in Quality and was one of the old timers—he moved to Titusville in 1956.

Glenn Stelzer, 90 passed away on 1 September. My recollection is that Glenn worked activations on both CX 41 and 40 in Purchasing.

Lockheed Martin (LM) News

Drivers of Discovery: Flying NASA's Most Important Missions

Lockheed Martin's Mission Support Area Celebrates Milestones, New Paths

Lockheed Martin Space designs, builds and tests spacecraft – and most people don't realize: we fly them, too.

Ours is the only industry company offering that level of turn-key service. Our Mission Support Area (MSA) in Denver plays a central role in making it possible.

From 30 years of mission operations that have logged 1 million flight hours and counting, we take a look at our flight operations by the numbers.

Three Decades of Mission Operations

The MSA got its start in 1989 with Magellan, NASA's first foray into Venus exploration. Lockheed Martin will again be involved in <u>NASA's grand return</u> to Earth's gaseous sister planet at the end of the decade.

The team built the Magellan orbiter in partnership with NASA's Jet Propulsion Laboratory (JPL). Lockheed Martin then set up an extension of the JPL flight operations

network at our Littleton, Colorado, facility to provide the voice, video and data infrastructure needed to fly the spacecraft around Venus.

And just like that, Lockheed Martin's mission operations team was born.

Kyle Martin, now chief systems engineer for mission operations, had just joined Lockheed Martin in the summer of 1989 when a supervisor approached him and asked, "How would you like to help us out with the Magellan Venus orbiter? We just launched it."

"I said, 'Sure,' went over there and never left," Kyle recalls. He helped lead the effort to build out the MSA's processes. "We had to develop everything – 'How do you send commands to a spacecraft? How do you approve them?' – and put together the processes that we still use today."

15 Different Spacecraft, Three Types of Missions

In all, the MSA has flown 15 different Lockheed Martinbuilt missions for NASA. Those spacecraft have orbited the Moon, Mars, Jupiter and Venus, touched down on Mars, and collected samples from solar wind, a comet and an asteroid.

The missions fall into three main categories:

- **Robotic orbiters and probes:** The MSA has several <u>robotic orbiters and probes</u> since Magellan traveled to Venus, including the GRAIL (Gravity Recovery and Interior Laboratory, 2011) lunar orbiter and the Juno (2011) mission to Jupiter. The trip to <u>Mars</u> has become a familiar one for the MSA, starting with the Mars Global Surveyor (MGS) in 1996. Other missions include Odyssey (2001), Mars Reconnaissance Orbiter (MRO, 2006) and MAVEN (Mars Atmosphere and Volatile Evolution, 2013).
- Landers: The MSA has also guided landers to the Martian surface. Phoenix touched down in 2008 and <u>InSight</u>, short for Interior Exploration using Seismic Investigations, Geodesy and Heat Transport, returned to the Red Planet in 2018. It's Lockheed Martin's 21st Mars mission and 11th Mars spacecraft.
- Sample return spacecraft: The MSA also has flown every one of NASA's sample return missions since Apollo. Genesis (2004) collected solar wind particles. Stardust (1999) captured bits of comet dust. The latest mission, <u>OSIRIS-REx</u> (Origins, Spectral Interpretation, Resource Identification, Security-Regolith Explorer) launched in 2016 and will return asteroid regolith to Earth in 2023.



A Lockheed Martin engineer focuses on the task at hand during OSIRIS-REx's departure from asteroid Bennu in May 2021. Photo: Lockheed Martin.

The MSA team is lean, with about 70 members working on multiple missions.

"It's common to find somebody that works on two, if not three or more, of our flying missions," Sandy explains, "because we keep all of our procedures and processes consistent across missions. That makes it easier for us to add staff if a program is coming up for a big event like an orbit insertion."

The teams include "aces" – the engineers who send commands through the DSN – as well as systems engineers, test engineers and subsystems engineers.

They do things like:

- Support in-flight maneuvers, testing and conduct special scientific research requests
- Monitor data to analyze general spacecraft health and evaluate trends
- Share data through the worldwide Deep Space Network (DSN) antennas
- Develop and validate commands to operate spacecraft
- Create background sequences and other routine functions that allow spacecraft to transmit data back to Earth
- Redesign mission capabilities to extend science collection

MSA team members are involved in every phase of a mission. "What we do is unique," Kyle says. "As soon as the mission contract is funded, we have our mission operations people involved at the very beginning with design. We're testing like we're flying."

"Then, we take all that knowledge we gain through design, development and testing back to the MSA where we fly the spacecraft all the way to the mission end," he remarks.

Six Missions in Flight Now

In June 2021, the MSA marked an incredible <u>1 million</u> hours of flight time.

With six missions still flying, that number will only continue to rise. The MSA currently runs mission operations for InSight, MRO, Odyssey, Juno, MAVEN and OSIRIS-REx. All except OSIRIS-REx have surpassed their original mission lifespan, and that's just because it hasn't returned its asteroid sample to Earth yet.

Like the spacecraft they fly, the MSA teams can handle even the most complex missions.

Our engineers developed and carried out delicate proximity operations for OSIRIS-REx as it orbited the tiny asteroid Bennu. It was the first time anyone has ever operated a spacecraft so close to a small celestial body and in a microgravity environment. When OSIRIS-REx's special TAGSAM (Touch and Go Sample Acquisition Mechanism) collection mechanism made contact with the asteroid Bennu to collect a sample, the MSA team was at the controls.

The MSA also handles shifting demands of extendedmode missions. The ability to adapt to their changing science and orbital requirements shows the MSA's versatility, says Sandy Freund, mission operations manager.

"A lot of these missions fly much longer than anyone anticipates during the design phase," she explains. "We might have to adjust to a new orbit that we hadn't analyzed before or figure out how to work within the constraints of the spacecraft to meet the science team's needs."

Four Missions Ahead



Seen here in production at Lockheed Martin, NASA's Lucy spacecraft will launch Oct. 16, 2021, and the MSA team will fly the mission after liftoff. Credit: Lockheed Martin.

And the excitement keeps growing, with four new MSA missions launching in the next several years.

First is the <u>Lucy</u> mission, with a launch window opening Oct. 16. The MSA will guide Lucy on its 12-year, 4-billion-mile odyssey to Jupiter's Trojan asteroids –the first spacecraft to explore those "fossils" of the solar system.

Next up is Janus, a pair of small satellites that will study two binary asteroids. One of <u>NASA's Small Innovative</u> <u>Mission for Planetary Exploration (SIMPLEx)</u> finalists, Janus will launch in 2022 to reach the asteroid system in 2026.

Also ahead are the newly awarded <u>VERITAS and</u> <u>DAVINCI</u> missions for NASA's Discovery Program, set for launch in the 2028-30 timeframe. Both missions will aim to discover how Venus – which may have been the first potentially habitable planet in our solar system – became inhospitable to life.

New Network for Future Mission

Starting with Lucy, our Ground Data Systems (GDS) team will pioneer an integrated ground services infrastructure dubbed MONET, or Mission Operations Network. Development of the system began back in 2018.

"MONET will provide integrated voice, video, and data infrastructure to support multi-mission development, test and flight operations. The architecture consists of the core MONET infrastructure, plus mission specific zones for external partner interfaces and unique needs," says Lance Tanaka, Ground Data Systems manager for the MSA.

The new infrastructure will allow efficient "As-A-Service" **capabilities for users while enabling future, standalone** mission operations services like mission planning, science processing or navigation. Plus, having this infrastructure also allows us to more easily integrate our digital transformation tools for things like data analytics or spacecraft monitoring and control," remarks Lance.

As the Lockheed Martin mission operations team prepares to add even more transformative technologies and spacecraft to its line-up, the team looks forward to all those missions will discover – one command at a time.

United Launch Alliance News

United Launch Alliance Successfully Launches Important Earth Science Mission for NASA

Landsat 9 Launch Blog Mission Photo Album

Vandenberg Space Force Base, Calif. (Sept. 27, 2021) – A United Launch Alliance (ULA) Atlas V rocket carrying the Landsat 9 mission for NASA lifted off on Sept. 27 at 11:12 a.m. PDT from Space Launch Complex-3 at Vandenberg Space Force Base. To date ULA has launched 145 times with 100 percent mission success.

"Thank you to our mission partners for the tremendous teamwork as we worked through a challenging health environment to launch this significant capability that will continue to enable future discoveries about our planet," said Gary Wentz, ULA vice president of Government and Commercial Programs. "We are proud to empower critical Earth science research through our long-standing NASA partnership."

The Atlas V delivered Landsat 9 into a near-polar, sun synchronous orbit around Earth, continuing the Landsat program's vital role of repeat global observations for monitoring, understanding and managing Earth's natural resources. The addition of Landsat 9 will continue Landsat's irreplaceable record of Earth's land surfaces with high-quality, global land imaging measurements for decades to come. This was the 88th launch of the Atlas V rocket and the mission marked the first four-burn Centaur mission for ULA on an Atlas V rocket. The first burn placed the Landsat spacecraft into the desired near-polar, sun-synchronous orbit, the second and third firings of the Centaur upper stage served to lower the orbital altitude and slightly change the orbital inclination to release the four CubeSats. A fourth and final burn by the Centaur's RL10C-1 cryogenic main engine executed the deorbit maneuver to dispose of the stage in a safe manner that does not contribute to space debris or cause an uncontrolled re-entry.

The mission launched on an Atlas V 401 configuration rocket that included a 13.7-ft (4-m) Extra Extended Payload Fairing (XEPF). The Atlas booster was powered by the RD AMROSS RD-180 engine. Aerojet Rocketdyne provided the RL10C-1 engine for the Centaur upper stage.

This was the 20th mission launched on an Atlas V in partnership with NASA's Launch Services Program (LSP). ULA's next launch, the Lucy mission for NASA, planned for Oct. 16, 2021, from Cape Canaveral Space Force Station, Florida, continues that partnership.

With more than a century of combined heritage, ULA is the nation's most experienced and reliable launch service provider. ULA has successfully delivered more than 140 missions to orbit that aid meteorologists in tracking severe weather, unlock the mysteries of our solar system, provide critical capabilities for troops in the field, deliver cutting-edge commercial services and enable GPS navigation. For more information on ULA, visit the ULA website at www.ulalaunch.com, or call the ULA Launch Hotline at 1-877-ULA-4321 (852-4321).



The Officers and Directors of MARS Associates invite you to join the 2021 Holiday Celebration on **WEDNESDAY**, **December 1, 2021**, at **The Wellshire Event Center**, 3333 South Colorado Boulevard, Denver, Colorado. This year we are offering you the choice of Prime Rib topped with Au Jus; French a l'Ancienne Chicken Breast with creamy mushroom sauce; or, Colorado Honey Glazed Salmon garnished with sweet corn and sweet peppers. Lunch will include a field green salad with red wine vinaigrette, fresh homemade bread with butter, Holiday Green Beans, Roasted Fingerling Potatoes and Wellshire's Sweet Table Dessert. Coffee and tea will also be provided.

The "cash" bar will open at 11:00 a.m. Lunch will be served at 12:00 noon. Please note that the Wellshire Event Center does NOT accept cash; credit or debit cards only, please!

The cost for members and one guest is \$27.00 per person. The cost for additional guests or non-members is \$52.00 per person. These prices include taxes and gratuities. Please specify your choice of entrée(s) on the reservation form below and mail it with your check (made payable to **MARS Associates**) to the address on the form below by November 19, 2021. Or you can make your reservation by using the STRIPE link below:

STRIPE (CTRL+click): https://form.jotform.com/210906787851061

Reservations must be received by November 19, 2021.

MARS Associates will be collecting donations for **Toys for Tots** again this year. If you wish to make a monetary donation, or wish to donate an *unwrapped* toy, we will be collecting them at the check-in table.

If you make a reservation and later find you cannot attend, please notify Linda Duby <u>lindaduby@comcast.net</u> or Charlie Haupt at 303-725-7595 or <u>qcrfccoach@gmail.com</u>, Carl Kaminski at 303-726-1546 or <u>carlcolo@centurylink.net</u> no later than **November 19, 2021** to receive a refund. Admission is by reservation only.

------ DETACH HERE ------

Holiday Celebration - December 1, 2021. Please print clearly. Mail to: MARS Associates, PO Box 1128, Littleton, CO 80160-1128

Member:	Beef		Salmon		Chicken	<u></u>
Spouse/Companion/Guest:	Beef	\$27.00	Salmon	\$27.00	Chicken	\$27.00
Other Guests:	Beef	\$52.00	Salmon	\$52.00	Chicken	\$52.00
(Add sheet for additional guest names) Member Phone No.						
Member e-mail address						
Member/Spouse/Companion/Guest @ \$27.00 = \$	Other guests @	\$52.00	= \$			
TOTAL ENCLOSED \$ Check #						





Senior Recognition Luncheon – July 14, 2021 Our Super Seniors!



Standing: Ron Gedeon, Clare Haag, Dick Brier Jr., Gene Horak, Fred Luhman, Leo Maloney, John Kimpton, George Dameron, Leo Johnson, Mike Davis Seated: Fritz Berns, Bob Boyce, Margo Breen, Illa Toney, Hazel Chapman, Barbara Maloney, Horace Clair, Gerald Mason



Jackie and Chuck Bird



Richard and Carolyn Hurley



Tom and Joy White



Fritz Berns



Ken Marts, Ray Head



Rod and Trudy Halverson



Art and Gloria Rosener



Horace Clair and David Clair

Rockies Game and Picnic – August 18, 2021



John Perrizolo, Norma Croucher and Denise Perrizolo



Jeanne Dowe and Donald Linden



Marion and Woody Norman



Joe Carroll All the way from Florida



Van Vandeventer and Larry Jones



Carolyn Malaby, Jill Walker and Paula Pinkley

MARS Associates Annual Picnic – September 8, 2021







Mary Ann Laurch, Academy (Vendor)



Becky Stout, OLLI (Vendor)



Winner #1: Phyllis Brudos



Winner #16: Tom Jones

More photos from the Senior Recognition Luncheon, the Rockies Baseball Picnic and Game, Annual Picnic and Car Show are posted on the website (<u>https:marsretirees.org</u>) and on the MARS Associates Facebook page. If you currently receive a printed copy you will continue to receive a printed copy. If you wish to receive hard (printed) copies in the future, contact Carl Kaminski at 303-726-1546 or via email at <u>carlcolo@centurylink.net</u>.

Schedule Addendum (See last page)

NOTES:

- 1. BOD meets as required
- 2. Officers/Directors meet 1st Wednesday of every month at 09:30 am.
- 3. Bridge Club meets 3rd Friday of every month at 10:00 am at Buck Recreation Center.
- 4. Car Club meets as noted on their website and periodic newsletter.
- 5. Dinner Club (All events are lunch unless otherwise noted): Check website for details
- 6. Golf club meets every Thursday from April through Oct of each year.
- 7. Hiking Club: Outings on 3rd Wednesday of the month. Check website for Point of Contact for each hike.
- 8. Photo Club meets 2nd Thursday every month (except Jun, Jul & Aug) at 1:00 pm on Zoom
- 9. Web Committee normally meets on last Tuesday of month, prior to BOD/Officer mtg, at a designated restaurant or by email.
- 10. Marketing Committee meets on a monthly basis as determined by members with guests invited (Typically last Thursday)
- 11. 2021 Holiday Celebration Dec 1 at Wellshire Inn
- 12. 2022 Annual Meeting Mar 9 at TBD location
- 13. 2022 Senior Recognition Luncheon July 13, 2022 TBD Location
- 14. 2022 Annual Picnic Sep 14 at Clement Park
- 15. See MARS website (https://marsretirees.org) for additional information on these events.

Please review dates and times and notify Ken Marts (martshouse2@aol.com) if you have any changes or additions.



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DATE: Nov 2021	2021 MARS ASSOCIATES EVENT SCHEDULE											
	2021 2022											
EVENT/MONTH	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct
Officers/Directors	3	11/30	5	2	2	6	4	1	6	3	7	5
Bridge Club	19	17	21	18	18	15	20	17	15	19	16	21
Car Club												
Dinner Club	-	-	-	-	-	-	TBD	TBD	TBD	TBD	TBD	TBD
Golf Club	-	-	-	-	-	Thur						
Hiking Club	17	15	19	16	16	18	20	15	20	17	21	18
Photo Club	11	9	13	10	10	12	14	-	-	-	14	13
Web Committee	29	28	25	22	29	26	31	28	26	30	27	25
Marketing Committee	29		27	24	24	28	26	30	28	25	29	TBD
MARS Events												
Happy Hour			TBD			TBD			TBD			TBD
Holiday Celebration		1										
Annual Meeting					9							
Senior Recognition Luncheon									13			
Annual Picnic											14	
MARS STAR Schedule												
Items due for MARS STAR												
STAR Input to Editor			4			5			5			4
STAR Repro. Deadline			17			18			18			17
STAR Mailing			26			27			27			26