

MARS STAR



MARS STAR has gone digital!!

If you currently receive a printed copy, you will continue to receive a printed copy. If you currently receive an electronic copy and wish to receive a printed copy in the future, contact Carl Kaminski at 303-726-1546 or via email at carlkcol66@gmail.com

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

OFFICERS

President	Ken Marts	303-868-2168
President-Elect	TBD	
VP Activities	Linda Duby	303-249-1665
VP Business	Gina Curet	281-691-4200
VP Communication	Dan Ellerhorst	303-263-1944
VP Membership	Carl Kaminski	303-726-1546
Treasurer	Charlie Haupt	303-798-7113
Secretary	Al Nemes	303-908-0157
Historian POC	Barb Sande	303-887-8511
Marketing Committee	Dick Sosnay	303-972-9209

DIRECTORS

Director Chair	Roger Rieger	303-912-6217
Director	Pete Munoz	720-308-1828
Director	Bill Wise	303-771-4887
Director	Robin Zen	303-335-6443
Director	Monte Kopke	303-973-4301
Director	Daniel Crumb	303-909-0490
Director	Debbie Carr	303-503-7113
Director	Heidi Urie	303-588-6762
Director	Mickey Clemons	720-470-0883

MARS STAR

Editor	Tom Pighetti	303-979-7933
Editor	Linda Stearns	303-797-3557
Memorials	Norma Emerson	303-646-1137
Website Team	Dan Ellerhorst	303-263-1944
Volunteers	Judy Nielsen	303-905-3957
<u>Reporting:</u>		
Cape Canaveral	Dick Olson	321-452-4015
Colo Springs	Doug Tomerlin	719-594-6392
Vandenberg	Eunice Souder	805-218-7605

CLUB CONTACTS

Bridge	Dave & Kathy Martz	303-683-9524
Car Club	Roger Rieger	303-912-6217
Golf	Sandy Mossman	303-730-8378
Hiking	Sue Janssen	303-936-8339
Photography	John Chapter (Pres)	303-986-8277

REMINDER:

If you move, please give the membership VP a change of address. Also, if you are a snowbird, let us know when 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.

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IMPORTANT PHONE NUMBERS

Pension related questions should be directed to: Lockheed Martin Employee Service Center (LMESC), 866-562-2363 toll-free within the U.S. 201-242-4397 from outside the U.S. 800-833-8334 for hearing impaired.

OR

HR benefits mailbox, benefits.hr@lmco.com

MARS Important Phone Numbers

(Be sure to have your MARS ID available)

MARS Delta Dental of Colorado

Individual Administrative Team: contact for Billing and Enrollment (change bank account info, update address, etc.) 877-516-6512

Individual@ddpco.com

Customer Experience Team: contact for Claims and Benefit questions 800-610-0201

customer_service@ddpco.com

Assured Partners of Colorado – For additional information dental (Delta Dental and Beta Dental, which is a Colorado only plan) or vision (VSP, which includes Exclusive Member Extras of hearing aids with Tru Hearing and EyeMed, which is part of Delta Dental at no additional cost)

[Joyce Sullivan](mailto:Joyce.Sullivan@apco.com) 303-226-0177

[Jon Elmore](mailto:Jon.Elmore@apco.com) 303-228-2206

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: <https://www.marsretirees.org>

MARS Facebook:

<https://www.facebook.com/groups/MARSAssociates>

Cover:

L: The Scottish style Cherokee Castle is a rare example of a 15th century castle and with its associated Cherokee Ranch was the target of a MARS Special Activity tour. See the Marketing Committee article on page 8.

R: NASA's Sustainable Human Landing System Will Land Crew on the Moon for Artemis V. See LM News on page 20. Photo Credit: LM.

From the Editor's Desk

Dan Ellerhorst(dan.ellerhorst@gmail.com)

Tom Pighetti (tipighetti@q.com)

Linda Stearns (linda80120@comcast.net)

For comments or corrections, contact Tom (issue editor) or Dan Ellerhorst, 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 **in advance** to the V. P. of Communications. Articles will be included as time / space allows.



President's Corner

By Ken Marts
martshouse2@aol.com

Happy mid-summer 2023! I hope you are getting familiar with our new website at www.marsretirees.org. Check-out the latest updates from Barb Sande (This Day in History), and the special events that Dick Sosnay and the Marketing team have planned (and those you have missed in pictures under the Events heading). Also, make sure you signed up to receive MARS Retirees mailings for both the MARS STAR and mass mailings on our activities for information on how to receive our e-mailings that ensure you receive active information from MARS Associates. This edition of the STAR includes the flyer for the upcoming Annual Picnic. Soon, you will see the flyer for the holiday celebration in December. Linda Duby is doing SUPERB work in planning the Picnic and Holiday events. Hopefully, many of you have also signed up for the Rockies game that Linda Stearns organized.

Dan Ellerhorst and his web team have done a GREAT job in bringing us up to current technologies with the website, which enhances our ability to capture event pictures from prior events and near-term events. See Dan's writeup on where we are going forward. Not to repeat myself, but MANY thanks to the prior work Jim Kummer and his team did on our previous website.

I recently had the opportunity to attend a political event at the Colorado Convention Center. It was a gathering of like-minded people with a purpose to organize and institute change. It reminded me of MARS and the activities (five standard events, Special Activities, volunteer activities with Lockheed Martin, and other volunteer activities) for which we have opportunities to engage. MARS Associates and your volunteerism allows ALL of us to engage in helping the community. Volunteering is something we can participate in to "Make A Difference"! Please share your volunteer activities with us so that we can share it with fellow members.

These volunteer activities can be MARS Associates related or those that excite the passion in your lives to enrich the lives of others. MARS Associates is always looking for volunteers for our community involvement. As an example, several of our members are currently working with LM to mentor young LM engineers and other professionals. The Marketing team is also looking for volunteers to lead activities in our Special Activities. Join the Officers/Directors in helping lead the direction of our

organization. Talk to any of the Officers or Directors for opportunities.

Gina Curet has done a thorough update of our Benefit's Website. Please take a look at the Discounts page and see if you can save some money! Also look at Gina's writeup for this MARS STAR with information about 2023-2024 benefit plan updates.

Carl Kaminski is also doing a fantastic job in keeping our membership roster up-to-date and providing name tags at our scheduled events. If you have any friends who are not members, encourage them to join us to stay in the know and partake in our many activities.

Charlie Haupt, as our Treasurer, is in the thankless job of ensuring that our membership dues are wisely spent and provide benefits to ALL our members.

The MARS STAR editorial team is also doing a wonderful job in preparing the quarterly MARS STAR to ensure our members are up-to-date. The MARS STAR is only one of our methods to communicate with our members. Our MARS Associates webpage and Facebook page are also used to communicate events and news to our members.

I'm sad to inform you that the Dinner Club will be dissolving effective July 1, 2023. Gary and Becky Englebright organized lunch and dinner activities at area restaurants for the last several years, managed thru the pandemic and have seen participation fall in the Dinner Club in our pandemic comeback. They have both worked to get interested parties to assume the leadership role in the club with no success. The remaining money in the Dinner Club has been donated to three charities of Dinner Club member choice. I'd like to thank Gary and Becky for their leadership of the Dinner Club over the last several years.

In closing, please email me if you have suggestions to improve our communication, recommend events, or ideas to enhance our organization. We welcome your comments!

Thank you and I hope to see you at our upcoming events!



Director's Notepad

By Roger Rieger
 Chairperson, BoD
rrieger10731@gmail.com

Greetings everyone! What a great bunch of new activities so far put on by your MARS Associates club this year! Hope you are as excited as I am by all the opportunities to stay connected with our former work colleagues doing fun things! This is what retirement is all about, thank you to all those who have stepped forward and organized these events. Without their efforts none of these activities would be possible, and a big shout out to Dick Sosnay in his leadership of the Marketing Committee where many of these activities take root and come to fruition.

I would also like to officially recognize Mickey Clemons who recently joined our MARS Board of Directors as a Director. Mickey has attended several Board meetings and we welcome his input and perspective as we continue to serve our fellow MARS members. Our board meetings are open to anyone interested in becoming a member of the management team. Meetings are held the first Wednesday of the month at the Red Rocks FCU headquarters building in Southpark. Meetings start at 9:30 and wrap up around 11am. "New blood" is essential for the continued vitality and growth of your Club, and I ask each of you to consider sharing your talents while having fun and staying connected with fellow MARS members.

The Annual Picnic is the next big event for MARS. It will be on September 13, 2023 and will be held at Clement Park in Shelters A, B and C on the east side of the park. The food will be catered by Smokin' Outlaw Kitchen. Beer, wine, water, and cookies will be provided. The flyer for the event is included in this edition of the STAR. As in the past there will be two methods of payment: electronic payment through the link on the website (<https://marsretirees.org>) or mail in the coupon with a check. The deadline for reservations will be September 2, which means we must have received your mail by September 2. The link for electronic reservations will be active until 7:00 p.m. on September 2. The caterer needs to have a headcount on that date so he can order and prepare enough food for this event.

The final event of 2023 will be the Holiday Celebration on December 6 at the Wellshire Event Center. The information on that event and the flyer will be in the October STAR.

I hope many of you take advantage or have taken advantage of the extra activities that are being planned this summer and along with the regular activities. Have a great, safe summer.



Activities Updates

By Linda Duby

(lindaduby@comcast.net)

MARS is off to a busy summer with activities. This summer along with the regular activities, MARS has been fortunate to have volunteers organize several fun activities.

On April 19, MARS had a happy hour at the Sportsbook Bar & Grill in Highlands Ranch. There were 61 members and guests in attendance to enjoy the appetizers and the camaraderie of other MARS members. There will be one more happy hour this year so watch for announcements on that event.

The Summer Luncheon Honoring Seniors is on July 12 and will be held at the Manor House at Ken Caryl Ranch. As of this writing we have 78 members and guests attending this event. There will be more information and pictures of this event in the next issue of the STAR.

The Rockies Picnic and Game will be on August 2 with the Rockies playing the San Diego Padres. Pictures and more on this event will be in the next issue of the STAR.



Business

By Gina Curet

(orion43@comcast.net)

Happy Summer Everyone!

It's been a very crazy Summer and I hope you all made it through the hail storms and tornado without too much damage. It's actually hard to believe that 1/2 of the year has passed.

Dental benefit renewals are right around the corner so I thought I would start with this topic. MARS Associates will no longer be offering BETA Dental (CO only plan) as an option due to lack of participation. Delta Dental's two plans, Medium and High, will continue to be offered for 2023-2024, with effective dates from September 1, 2023 through August 31, 2024. There has been a 4.6% increase in plan costs (much like everything we have experienced this year), however I believe these are still very competitive industry rates for our retirees. Please review the guidelines for enrollment requirements at retirement and/or Cobra coverage end. Look on the

MARS website under "Benefits," "Dental Plans" for rate comparison information which will be updated soon!

Getting ready to select Medicare benefits or already 65 and receiving benefits, but still confused? Kaiser Permanente is providing a "Medicare 101" class on Wednesday, August 16th from 9-10 AM at Red Rocks Credit Union located at 8195 Southpark Lane, Littleton. We currently have 15 seats available, so email me directly to be added to the registration at orion43@comcast.net. This will be a great opportunity to get educated!

We have a new dropdown page on the website "Benefits" page for "Hearing Aids"! Amplifon Hearing Health Care Corporation offers up to 66% savings from retail pricing and has many other benefits (offered through Lockheed Martin). If you are a VSP Vision Care member, you and your extended family members can utilize TruHearing for savings up to 60% off name-brand hearing aid products. This is one of VSP's exclusive member extras. Check out both on the website!

Pension and Medical Benefits questions? We all have them! There are many methods to get your questions answered: the LM Employee Service Center; (*NEW*) LM HR benefits mailbox, benefits.hr@lmco.com, the ULA Benefits Contact website page, and (*NEW*) ULA benefits mailbox, ulabenefitsadministration@ulalaunch.com. I will always try my best to help you when you have a problem, however these are the best resources for your personal questions.

Discounts - thanks for the great feedback on the Avis article. You have probably noticed that the Corporate Discounts website page has been updated. I will try to highlight a new vendor each issue. This quarter, the discount of choice is "TicketsatWork.com". They provide discounts and special offers for many popular theme parks and entertainment attractions. Company Code: LMC. Visit the website to purchase tickets. I have and it is great savings! Stay tuned for the (*NEW*) "MARS Local Discounts" website page to be updated. Several of the Directors are diligently working to update information for ~40 companies to ensure we provide accurate discount information to you.

The Social Security Administration has an improved benefits website! If you do not have a current online account, you can create one with a Username and Password, including 2-factor authentication for security. The website is secure.ssa.gov and you can review your statements, replace a card, review eligibility and earnings as well as many other topics. Check it out!

Finally, many of us, if not everyone, has been burdened with historic property tax increases this year (mine

increased 57%). You have many rights as a homeowner that I want to share. First, understand your assessment/updated property values and where your tax money goes. If you disagree, you can appeal your assessment. Also, take advantage of the exemptions available to seniors, veterans, and surviving spouses! They are: (1) Senior Property Tax Homestead exemption; (2) the Qualifying Disabled Veteran exemption; and (3) the Gold Star Spouse (surviving husband or wife of a military member who died in the line of duty or from injuries or disease related to service) exemption. Get informed by

visiting: <https://cdola.colorado.gov/divisions-programs/division-of-property-taxation> and vets.colorado.gov. There are requirements and deadlines for each, so don't delay your research!



Communications

By Dan Ellerhorst
(dan.ellerhorst@gmail.com)

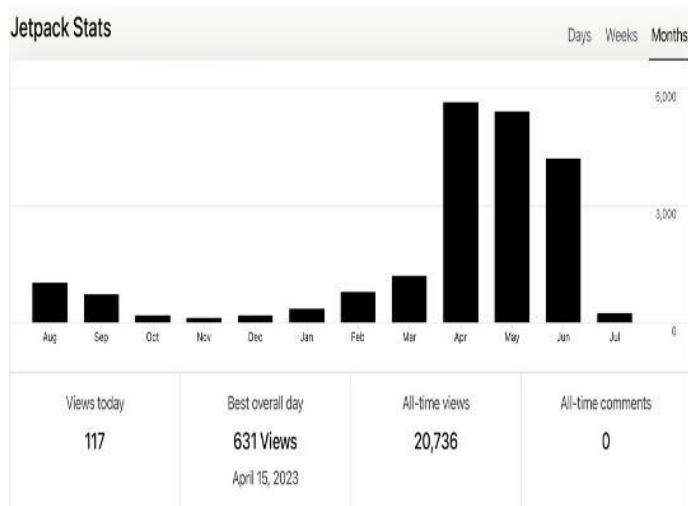
We have made a lot of progress over the past few years in modernizing and expanding our communications capabilities within MARS Associates. Today we have four primary ways of communicating with our membership: 1) the MARS STAR, 2) the MARS Associates website, 3) mail services, and 4) the MARS Associates Facebook Group.

The quarterly MARS STAR has always been a mainstay of our communications domain. By moving to a largely digital version, we achieved efficiencies of cost, ease of production and distribution. We have retained a smaller production run of hardcopy versions for those members who still prefer to receive their STAR this way and to provide handout copies for marketing and recruiting purposes. Our last edition involved 279 mailed hardcopies and 1185 e-mailed softcopies. Our two editors Tom Pighetti and Linda Stearns do an outstanding job of assembling and editing these newsletters. Anyone who feels an urge to indulge their latent journalistic impulses in retirement is encouraged to contact me, Tom, or Linda.

The MARS Associates website has completed its initial migration to the Dreamhost/Wordpress based version, and is, in my opinion, looking very good. Our content editors are getting better at using the tools and the content is increasing and becoming more current every week. Steve Sande has agreed to take on the indispensable role of Webmaster, for which we thank him very much. We all continue to learn new things in this environment – I for one have recently learned the acronym SEO (Search Engine Optimization). If you have

noticed recently that your Google search for “MARS Retirees” is taking you to the MARS Candy Company page instead of your favorite, then SEO is involved in the answer. Steve is working on it now and I hope it is largely resolved by the time you are reading this. Steve is assisted by a group of Website Administrators including Rick Gonzales, Mark Brown, Bob Knickerbocker, and Carl Kaminski. There are many content editors, whose names you will see associated with posts and updates on the website. Kudos to all of them for their efforts.

In case you are interested, the chart below gives you an idea of the volume of traffic on our new website. We officially switched over from the old website in April of 2023 – so the traffic you see before that was the setup, training, and beta testing done prior to the switchover. The data below was current as of July 2nd.



Our third communications method is mail services. We use traditional “snail-mail” in cases where we need to be sure to reach a member, such as for a final membership renewal or drop notice. Most mail comes to you digitally via our new e-mail server. This can be an individual message sent to the e-mail address that you provided with your membership information, or more commonly via a group distribution list. Our Dreamhost mail app refers to these as “Announce Lists” and in order to be added to these lists you must take a “Subscribe” action on the website. There are currently two such lists: one for general membership-wide e-mails, and one for announcing the availability of the digital STAR. The general MARS Associates List currently has 655 addresses and the MARS STAR List has 489. Note that subscribing to the MARS STAR announce list does NOT affect your choice of receiving a hardcopy version, if you have already elected that. With only 655 members on the general MARS Announce list – we are clearly somewhat constrained in quickly communicating with our more than 1300 members. So, I once again encourage you to go to the website and subscribe to this list. There is a big blue

button on the homepage labelled MARS EMAIL LISTS. Just click that and follow the instructions. If you have questions or need help, get in touch with me (contact info in the front of the STAR).

Finally, our MARS Associates Facebook Group continues to share many interesting posts. It is a closed group – limited to MARS Members and immediate family, and LM and ULA employees approaching retirement. The group currently has 425 members. If you are a Facebook user, you can search groups for MARS Associates and request to join it.



Membership Report

By Carl Kaminski

carlkc66@gmail.com

MEMBERSHIP STATISTICS

As of July 1, 2023, there are 1,232 MARS Associates members, including 576 senior members. We have a total of 53 new members who have joined MARS for the 2023 CY.

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

Colorado

Broomfield	Henry & Ann Rollert
Castle Pines	Robert & Michelle Havard
Castle Rock	Cindee Molnar
Highlands Ranch	Thomas & Gisela Hillyer, Kent Krause, Dave & Julia Morrow, Michele & Garrett Olson, Jerry & Kari Riechers, John & Julie Tobin
Lafayette	Mark McKercher
Littleton	Guy & Karen Long, Joseph & Peggy Angeli, Frank & Brenda Corl, Tim & Van Gallagher, Kai & Melinda Lo, Kent & Margaret Woods
Parker	Daniel & Cheryl Harris

Other States

Florida

Oviedo Jeff & Julia Hunt

Pennsylvania

Philadelphia Julia Balmer & Kevin Millhouse

Membership Renewal

Drop notices in the form of a bright yellow postcard were sent to all members who had not submitted their membership renewal as of June 8th. Please contact me as soon as possible if you believe you were sent this notice in error.

NEW MEMBERS

Do you know someone who recently retired from LM or ULA? First year membership in MARS is free for 2023. Direct them to the website for more information or have them contact one of the Officers or Directors.

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 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

Andis, Kenneth (D: December 2022)
(Survived by Virginia Andis)
Knoxville, TN
<https://tinyurl.com/3cjnjem9>

Bennett Jr, Fred (D: May 2023)
(Survived by Jean Bennett)
Centennial, CO
<https://tinyurl.com/3fdnnsu8>

Coleman, Verne (D: June 2023)
(Survived by Beverly Coleman)
Littleton, CO
<https://tinyurl.com/33psvaxy>

Costello, Martin (D: May 2022)
Centennial, CO
No obituary published

Detmers, Marliiss (D: December 2022)
(Survived by Wesley "Jack" Detmers)
Springfield, MO
<https://tinyurl.com/yjvezyw4>

Emerson, George W. (D: September 2022)
Littleton, CO
No obituary published

Grant, Charles "Charlie" (D: May 2023)
Centennial, CO
<https://tinyurl.com/2p84t2de>

Jenson, Roy (D: February 2023)
(Survived by Essie Hatch)
Centennial, CO
<https://tinyurl.com/47pmrv3y>

Rivers, James "Jim" (D: June 2023)
(Survived by Patricia Rivers)
Highlands Ranch, CO
<https://tinyurl.com/4xdaju8u>

Stofer, Donna (D: August 2022)
Littleton, CO
<https://tinyurl.com/47342w2v>

Non-Members

Cordova, Jimmy (D: April 2023)
(Survived by Linda Cordova)
Highlands Ranch, CO
<https://tinyurl.com/raht6fsb>

Fester, Dale (D: May 2023)
Littleton, CO
<https://tinyurl.com/2ux62xry>

Garverich, John "Jack" (D: May 2023)
(Survived by Evelyn Garverich)
Littleton, CO
<https://tinyurl.com/336a4see>

Gerlach, Glenn (D: April 2023)
Evergreen, CO
<https://tinyurl.com/6s5jf6dn>

McAnally, Elsielea "Lea" (D: April 2023)
Centennial, CO
<https://tinyurl.com/2d3r2wk2>

Murphy, John Payne (D: April 2023)
Denver, CO
<https://tinyurl.com/rmc565ru>

Pestik, George (D: November 2022)
(Survived by Sheena Pestik)
Punta Gorda, FL
<https://tinyurl.com/2annj9k7>

Prince, Roger (D: February 2023)
(Survived by Joyce Prince)
Littleton, CO
<https://tinyurl.com/2yz748c8>

Reseigh, John (D: June 2023)
(Survived by Amy Reseigh)
Littleton, CO
<https://tinyurl.com/yc7xjhw5>

Rhinehart, Richard "Dick" (D: May 2023)
(Survived by Phyllis Rhinehart)
Hendersonville, NC
<https://tinyurl.com/yc7xu7ws>

Richardson, Margaret "Allie" (D: Dec 2022)
Littleton, CO
<https://tinyurl.com/bdzzkyvh>

Rose, Lawrence "Larry" (D: December 2022)
Castle Rock, CO
<https://tinyurl.com/ytntd8c3>

Tefft, Adeline (D: February 2023)
Littleton, CO
<https://tinyurl.com/yc2crerv>

Tullis, Marta (D: March 2023)
Littleton, CO
<https://tinyurl.com/3bvz29h9>

Watkins, Timothy "Tim" (D: December 2022)
(Survived by Mary Watkins)
Littleton, CO
<https://tinyurl.com/2s3nr87f>

Marketing Committee

By Richard Sosnay
(richardsosnay@gmail.com)

Our MARS Special Activities continue to be heavily supported this year. Out of the eight Special Activities

planned for this year, we have completed 3 of them by the time is going to press with this issue of the MARS STAR, and by the time you are reading this, we will have completed 2 more. We have had a great visit to the Cherokee Ranch and Castle, and an exciting trip up Pikes Peak on the Manitou Springs Cog Railway. The following is a brief summary of our plans and accomplishments for the year.

Event	Date	Comments
Special Activities Accomplished in 2023		
ULA Plant Tour	03/06/23	Great Tour, Will try to add some more tours in 2023
Cherokee Ranch & Castle Manitou (Pikes Peak) Railway	05/16/23	Wonderful Tour. Lunch at Los Dos Potrillos
	06/08/23	Exciting train trip. Lunch at Crystal Park Cantina
Special Activities Planned for 2023		
Wildlife Animal Sanctuary	07/19/23	Morning & afternoon tours, 30 max each
Central City Opera LM	07/26/23	
Waterton Campus Tour	08/10/23	Lunch planned at Airplane Restaurant in Colo. Springs
WWII Museum of Aviation	08/17/23	
Wine Tasting	Fall 2023	

Following is a brief description of each activity for 2023:

ULA Plant Tour

The ULA plant Tour, led by Terry Lilly, toured ULA's Denver facilities on March 6. A great time was shared with MARS members and friends. That tour was written-up in the April 2023 MARS STAR, and a slide show can be found on our MARS Web Site.

Cherokee Ranch and Castle tour

The MARS Members had the pleasure of experiencing a tour at Cherokee Ranch & Castle in Sedalia, CO on 16 May 2023. This tour was coordinated by Peter Munoz. There were 53 people in the group that included MARS Members, family & friends. It was a beautiful sunny day with views from the turret patio where we could see from Pikes Peak to Longs Peak (near Rocky Mountain National Park). At the conclusion of the tour, 29 MARS Members gathered at Los Dos Potrillos in Highlands Ranch to enjoy Mexican food and drink.

The tour started promptly at 10am where we were met by four Castle Docents and 4 tour guide assistant volunteers. The Scottish style Cherokee Castle is a rare example of a 15th century castle. Standing tall, built of locally sourced rhyolite and petrified wood, the Castle houses a collection of world-class art, antiques, and rare books, serving as a public host for an array of cultural, scientific, and civic events, while the expansive property of Cherokee Ranch sustains habitats for native wildlife, flora, and fauna, embodying the heritage of the west. The Foundation that operates this property "is committed to preserving the natural environment, enhancing cultural life in Colorado and providing educational opportunities devoted to western heritage, wildlife, and the arts." The Ranch & Castle includes land that originally belonged to two separate homesteads in the late 1890s; the Flower Homestead was purchased by the Johnson Family in 1924. They then took two years to build the castle. They then sold the property to Mildred Montague Genevieve 'Tweet' Kimball in 1954. Tweet purchased the neighboring Blunt Homestead and renamed the property Cherokee Ranch which includes 3400 acres.

The MARS groups were provided history of not only the castle, but the furnishings, the arts within the property and local history, too. One piece of history is that Tweet Kimball brought Santa Gertrudis cattle from Texas contrary to some men in the cattle business telling her the cattle could not handle the winters and the altitude. Tweet did her research and went against the recommendations. These animals continue to thrive and are shown and competed in the Colorado Stock Show. "In 1966 Tweet worked to protect Cherokee Ranch through a Conservation Easement. The Foundation holds the deed to the land that is now protected as a wildlife sanctuary, and a small herd of the cattle are still bred on the land."

Today you can take your family and friends for a tour, guided hikes on the property, enjoy "Tea at the Castle," a hayride enjoy a wine or whiskey tasting or a Frank Sinatra Tribute show and other concerts throughout the year.

You can learn more about the property and the history by clicking on this link - [Cherokee Ranch & Castle Foundation](#).

If you are interested in seeing the event MARS Photobook click on this link - [Cherokee Ranch & Castle May 2023](#), or go to the slideshow of the Cherokee Ranch and Castle Tour on the MARS web Site. See tour pictures on page 25.

Manitou (Pikes Peak) Cog Railway

This trip was coordinated by Robin Zen. We had 51 members and guests participate in the Manitou Cog Pikes Peak train trip, for a 3-hour tour. This was an exciting 9-mile ride up to the top of Pikes Peak at 14,115 feet elevation! Our group rode on the new cog train from Switzerland (much quieter than the previous trains) and new tracks (known as the world's highest cog railway). The first train on Pikes Peak took passengers to the summit in 1891. At the top, we wandered through the new visitor center gift shop and museum, with some of us enjoying the special high-altitude Summit Donuts!

The train travelled through the Pike National Forest, with views of Ruxton Creek, Minnehaha Falls, Diamond Rock, and Englemann Canyon. The weather was sunny, yet cool at the top (about 34 degrees), and there was a surprising amount of snow, some completely covering the viewing platforms. We lucked out with beautiful weather (as I later discovered that 4 days after our trip, there was a blizzard on the summit!) On the way up and back, we saw birds, marmots, waterfalls, Ponderosa pines, spruce trees, and an old Bristle Cone pine (estimated 1000 years old). The views from the 14,115-foot summit were breathtaking!

Following the train ride, most of the group reflected on the sights seen and wonderful memories of the adventure, while enjoying drinks and homestyle Mexican food at Crystal Park Cantina in Manitou Springs.

Thank you to everyone who joined this adventure! A slideshow of the tour can be seen on our MARS Web Site. See tour pictures on page 27.

The Wild Animal Sanctuary

The Wild Animal Sanctuary tour is being led by Carolyn Malaby. The world's largest carnivore sanctuary is home to over 550 lions, tigers, bears, wolves, leopards, and other animals, and you can see them all safely from their Walk into the Wild walkway ABOVE them where they don't feel threatened and don't pace like they do in zoos. This place is a treasure, and you will help them feed these animals and educate people about the captive wildlife crisis with your entrance fee. By the time that you read this, the tour will have been completed. We will report on this tour in the next issue of the MARS STAR.

Central City Opera

The Central City Opera visit is being led by Sue Janssen. We are planning on seeing a matinee performance of *Kiss Me, Kate* at the wonderful Central City Opera house on Wednesday, July 26. *Kiss Me, Kate* is a sophisticated, romantic, and delightfully hilarious opera with a sparkling Cole Porter score. By the time that you read this, the tour

will have been completed. We will report on this tour in the next issue of the MARS STAR.

LM Waterton Campus Tour

The LM Waterton Campus tour is being led by Judy Nielsen. We are planning the tour on August 10, 2023. There will be a morning and an afternoon tour, with each having a max capacity of 30 people. Judy will send out an email to all of those who have expressed interest in an LM tour, giving details and allowing them the opportunity to sign up for this tour. Thanks to LM HR for sponsoring this exciting opportunity for our members.

World War II Museum of Aviation in Colorado Springs

The World War II Museum of Aviation is being led by Judy Nielsen. The museum is located near the Colorado Springs airport. Opened to the public in 2012, the National Museum of World War II Aviation documents the role that military aviation played in the emergence of our nation as a world power during the Second World War. Through a combination of its aircraft collection, exhibits, interactive displays, and docent led tours, the museum tells the story of our nation's tremendous technological advancements during the War, and describes the lasting social and economic changes that were essential to the success of the Allied war effort. Following the tour, we will be having lunch at the Airplane restaurant in Colorado Springs. We are planning on a visit to the museum on August 17, 2023, so there is still time to contact Judy and let her know if you are interested.

Wine Tasting

We are still working on setting up the Wine Tasting Tour, but we have been informed by the Winery that we were planning on visiting, that they wanted a large deposit and a committed minimum spending plan, so we are looking at other options to see if we can find a wine tour that would be more accommodating for our group. Stay tuned and we will let you know as soon as we find out.

Volunteer Activities

By Judy Nielsen

jniel129@gmail.com

For this edition of MARS STAR, we do not have a volunteer team report. So, this gives me an opportunity to remind our retirees, that if you serve your community, we would like to hear from you.

Each quarter, we like to highlight a volunteer and their organization in the MARS STAR. If you are interested in sharing your volunteering experience(s), please send your write-up to Judy Nielsen, MARS Volunteer Activity Coordinator, at jniel129@gmail.com. Not only will this

provide recognition for the good work being done, but it will also encourage others and provide information for those looking to volunteer. Additionally, MARS Associates will donate \$50 to that volunteer's charity/organization.

As for volunteer opportunities within Lockheed Martin and United Launch Alliance, I am happy to report that things have opened up. We recently received a request from LM Space for volunteers to support the upcoming Waterton Auto Show (and show their classic cars), as well as a request for Bike-to-Work Day volunteers. We also are providing several volunteers for ULA in October for their Young Minds at Work event. We expect to have more volunteer requests for events later this year at both companies. So, if you have not already submitted your name and email address for volunteer consideration, please send an email to jniel129@gmail.com.

There are other volunteer activities you can become involved in within MARS, so please contact Judy Nielsen, or any officer/director to find out more.

Happy Volunteering!

Historian Corner

By Barb Sande

barbsande@comcast.net

Program Profile

This issue continues a multi-part series on the Skylab orbiting laboratory and the crewed missions for their 50th anniversaries.

ANNOUNCEMENT: Starting in 2023, I will be exploring the Skylab missions for their 50th anniversary. I am calling for all retired folks who worked on Skylab to consider writing a short story, anecdote, or technical problem that they were involved with during the development of Skylab (include short biographical details). Please submit these **written** stories to me by **SEPTEMBER 30, 2023** (deadline extended from July 31) through email (see above). The stories can be in the body of an email or a short, attached document (MS Word or Pages is fine), and pictures are also welcome if you have any (maximum word limit is 1500 words). These stories will be included in a write-up later in 2023 or early 2024 that summarizes the Skylab initiative. **Written stories only, please!** I have no plans to do a roundtable or accept oral stories on a phone call.

Planned Articles:

Skylab Part I: History of a Space Station Concept; Skylab is Born – COMPLETE, in 2023 Q2 MARS STAR

Skylab Part II: Mission Objectives and Plan, Technical Features of the Skylab Design; Integration and Test, Launch of Skylab I; Skylab Anomalies – This issue Q3 MARS STAR

Skylab Part III: Skylab 2 – Skylab Anomaly Resolution; Crew Selection and Training, First Crew; Skylab Repairs – Q4 2023

Skylab Part IV: Skylab 3 –Memories from Martin Marietta Retirees – Q1 2024

Skylab Part V: Skylab 4 – Second Crew/Third Crew, Demise of Skylab (possible split into two articles) – Q2 2024

Introduction to Part II

At the end of the first article describing the efforts to create a space station concept, I ended the article with a first look at the final Skylab elements and where they came from and the specific contract awards for our heritage companies (Martin Marietta, General Electric). As the elements are briefly discussed in an upcoming section, contractors are identified and graphics shown where appropriate. This article also talks about the integration and testing process, the launch integration, and the launch of Skylab itself on the last Saturn V on May 14, 1973. The launch resulted in serious damage to the Skylab orbiting laboratory, requiring heroic efforts by the first crew to repair those defects (those repairs and the first manned mission to Skylab will be covered in Part III).

As I did research for supporting documentation for these profiles on Skylab, I was extremely fortunate to stumble across an on-line archive of a fantastic NASA book about Skylab that was published in 1981 and is contained in their history library (see link at the end of this article). A lot of the details in these articles will come from this NASA book (SP-4208 Living and Working in Space: A History of Skylab). In addition, I found another NASA document published in October, 1971 that was a program description of Skylab for release to the media plus I found a useful chronology of the Skylab program in NASA document SP-4011. I also happened across another NASA document, SP-107, entitled SKYLAB: A Guidebook, plus NASA has a Skylab good program description in their archives. I will include personal written stories from former Martin Marietta/LM employees (see announcement) later in this multi-part series.

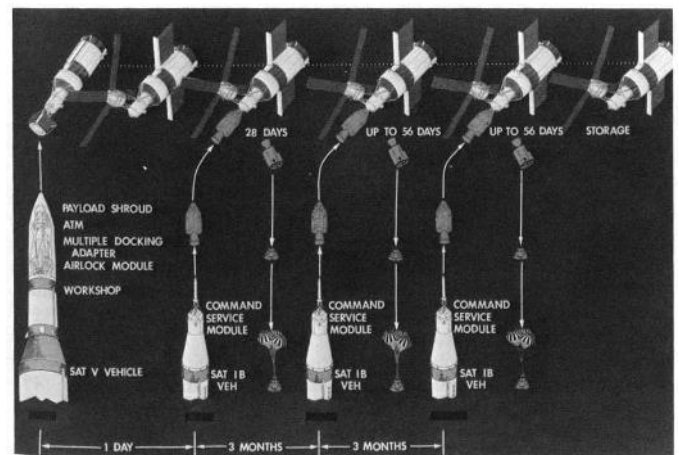
NOTE TO READERS: If you detect an error or omission in this article and future articles because you have first-hand knowledge, please let me know and I will publish those corrections with future articles.

Skylab Mission Objectives and Plan

The mission objectives for the Skylab project were finalized over the last few years of its development. They fall into four different categories:

1. Conduct Earth resources observations
2. Advance scientific knowledge of the Sun and stars
3. Study the processing of materials under weightlessness
4. Better understand manned space flight capabilities and basic biomedical implications.

The elements, experiments and systems of Skylab were integrated together to meet these objectives. The vehicle plan called for operation in space for approximately eight months with the unmanned launch of the orbital station and three visiting manned missions (the first manned mission was planned for launch the day after Skylab – this was changed by the reality of the launch damage to Skylab). The plan called for Skylab to be inserted into a nearly circular orbit at an altitude of 235 nautical miles and an inclination of 50 degrees to the equator.

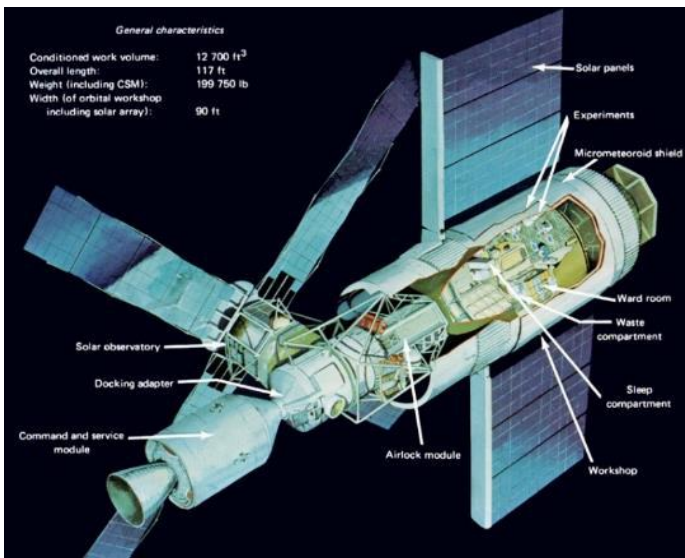


Skylab Mission Plan EP-107 Skylab: A Guidebook

The Elements of Skylab

The major elements of the orbiting workshop and the support systems included the Orbital Workshop (OWS), the Apollo Telescope Mount (ATM), a Multiple Docking Adapter (MDA), an Airlock Module, Solar Arrays (OWS and ATM), an Instrument Unit, a Payload Shroud, supporting systems for the OWS and ATM, experiment packages, a Command and Service Module, and a modified Saturn V launch vehicle for Skylab itself and Saturn IB launch vehicles for the crews, along with appropriate ground systems. The following subparagraphs describe some of these elements in the most basic and top-level ways, as details would make this article too long. Elements of a back-up Skylab system was also built during the production phase.

The planned cluster configuration of the orbital Skylab system is shown in this NASA artist's conception:

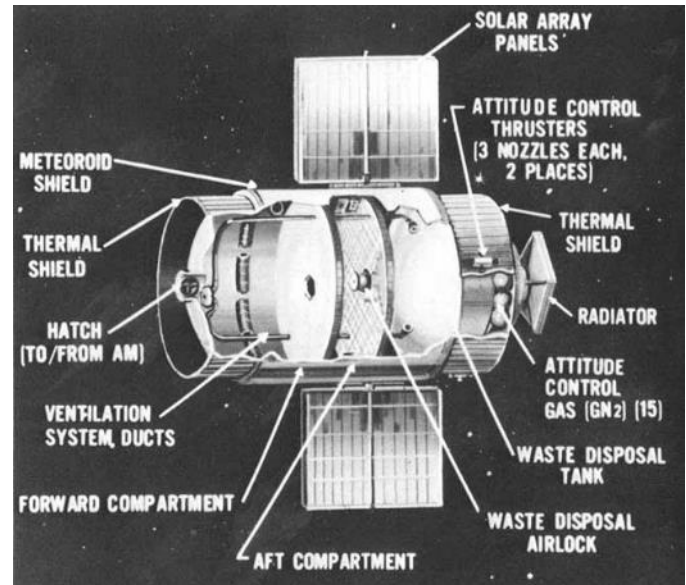


Skylab Orbital Workshop from History.NASA.gov

1. Orbital Workshop (OWS)

The heart of the Skylab system was the OWS, which provided the primary on-orbit living and working quarters for the crews and platforms for additional experiments that were not associated with the ATM. The OWS was made from the structure of a Saturn IVB stage, provided by McDonnell-Douglas Astronautics (primary location, Huntington Beach, California) in a contract managed from Marshall Space Flight Center. The OWS was 21.6 feet in diameter by 48 feet in length with a total habitable volume of 9,550 cubic feet; it weighed 78,000 pounds and was divided into two major compartments. The upper compartment formed a two-level habitable area, while the lower level has accommodations for sleeping, food preparation and consumption, hygiene, waste processing/disposal and performance of life science and physics experiments.

Two solar array wings were mounted outside the workshop to generate electrical power (along with fuel cells) and to augment the power from another set of solar arrays on the Apollo Telescope Mount. Thrusters were installed at one end of the workshop to allow orientation changes. A shield enveloped the OWS, about six inches from the outer surface providing protection against micrometeoroid damage to the inhabited areas, plus secondary thermal control (more on this shield and arrays later in the discussion about the launch anomalies).



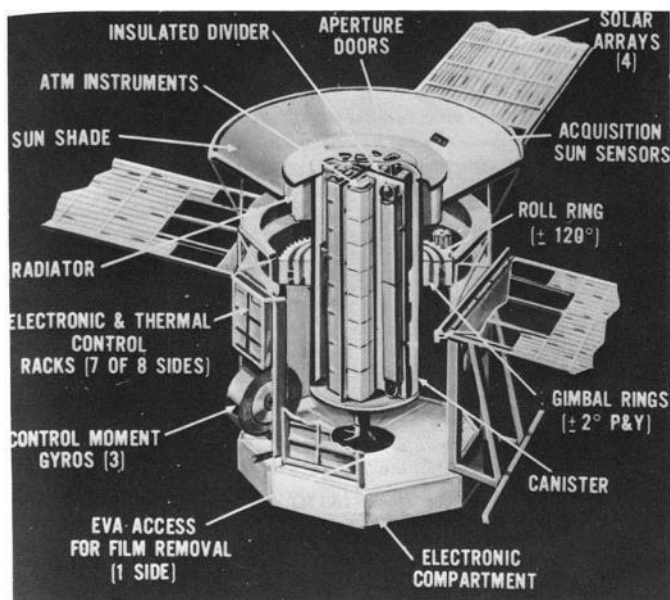
OWS Basic Configuration from EP-107: Skylab, A Guidebook

Work on creating the OWS began in April, 1969. McDonnell-Douglas took the S-IVB state 212 out of storage and began modifying it. Almost immediately, significant revisions to the complex OWS were encountered due to changing requirements and difficulties in implementing various subsystems. However, despite significant delays, the OWS flight hardware was finally delivered to the Cape in September, 1972, ready for stack preflight testing. The complexity of the OWS has been compared to the challenges in creating a completely new type of aircraft, like the Concorde. The supporting OWS systems like electrical, environmental, thermal, water, and habitability are discussed in a separate subparagraph.

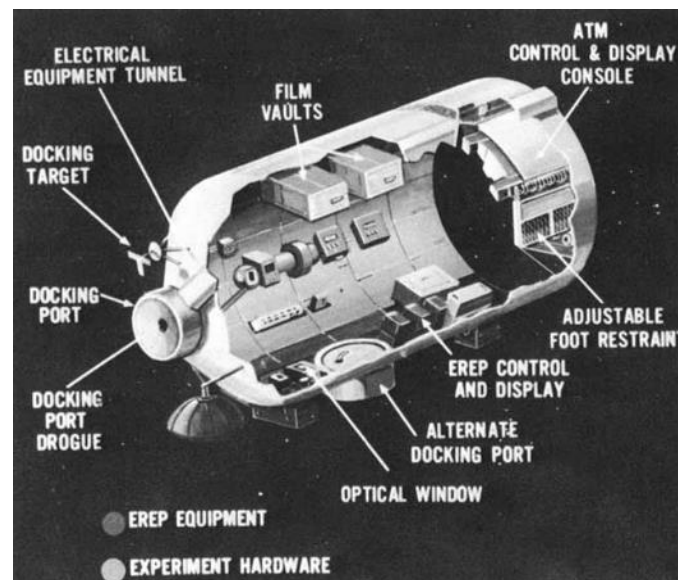
2. Apollo Telescope Mount (ATM)

The ATM was a crewed solar observatory that was designed and constructed at Marshall Space Flight Center. The ATM consisted of eight major observational instruments from a variety of subcontractors (Naval Research Laboratory, Harvard College Observatory, General Electric, Honeywell, American Science & Engineering, Itek, Goddard Space Flight Center, Cutler-Hammer Airborne Instruments). These instruments made observations across several wavelengths, including X-ray, Ultraviolet and visible light. Here is a list of the major instruments and their designations:

- Two X-ray telescopes (S-054 and S-056)
- Extreme ultraviolet spectroheliograph (S-028A)
- Ultraviolet spectroheliometer (S-028B)
- Ultraviolet spectrograph (S-055)
- Visible light coronagraph (S-052)
- Two Hydrogen Alpha telescopes (designated 1 & 2)



ATM Basic Configuration from EP-107: Skylab, A Guidebook



MDA Basic Configuration from EP-107: Skylab, A Guidebook

The ATM weighed 24,500 pounds and was 14.7 feet in length and 11.3 feet in diameter, with no habitable volume for crew. A Command & Display crew console for the ATM was located inside the OWS. Consisting of two concentric elements, the ATM had an outer rack supporting the inner solar experiment canister and the four ATM solar arrays, the attitude control system, a communications system, and thermal controls to maintain the observing equipment within the design limits. The ATM support structure connected the rack to the forward end of the fixed airlock shroud on the Airlock Module.

The solar experiment canister was mounted on gimbals that allowed it to rock 2 degrees on perpendicular axes and had two work stations for astronauts to perform the EVA task of changing the film in the cameras. The ATM design required testing in zero-G environments, which was done in a new neutral buoyancy facility at Marshall Space Flight Center. A thermal vacuum test of the ATM was performed at JSC.

3. Multiple Docking Adapter (MDA)

The MDA provided the docking port for the arriving and departing manned CSMs (Command/Service Modules) and was the control center for the ATM and Earth Resource Experiment Package (EREP) experiments. The MDA contract, as noted near the end of the last article, was awarded to Martin Marietta in Denver to give the company a hardware build task in addition to the Payload Integration and spacecraft support tasks. The shell of the MDA was built at Marshall Space Flight Center, then shipped to Denver for outfitting and testing.

The MDA weighed 12,000 pounds and was 17.3 feet in length and 10.5 feet in diameter and had a habitable volume of 1,140 cubic feet. Two ports were provided on the MDA for docking the CSM. The primary port was axial and located at the forward end of the MDA and the alternate port was radial and located on the side of the module. The two docking ports allowed for possible rescue operations or a second crew if considered a feasible option. Cameras and EREP sensors were located adjacent to the alternate docking port. The control and display console for the ATM was located at the rear of the MDA, which contained the controls and instruments required for operation and observation of the ATM solar astronomy experiments.

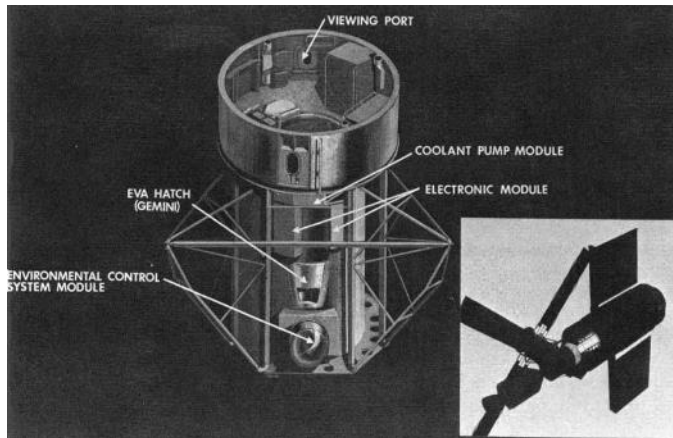
The completed MDA was shipped to McDonnell-Douglas in St. Louis in December, 1971 for integration with the Airlock Module. No significant problems were noted that delayed this element. Martin Marietta built zero-g and neutral buoyancy trainers to aid in the training and testing of the MDA. The Airlock Module and the MDA arrived at KSC in October, 1972 for further testing and integration.

4. Airlock Module (AM)

This structure was the environmental and electrical control center for Skylab. Built by McDonnell-Douglas in St. Louis, the Airlock Module weighed 49,000 pounds, was 17.6 feet in length and 10.5/21.6 feet in diameter, with a habitable volume of 613 cubic feet. This airlock contained a port that was used for egress for EVA (extravehicular activities) for the crew.

The AM was attached to the forward end of the OWS and provided structural support for all modules mounted or docked forward of its location (MDA, ATM/solar panels, CSM). It consisted of two concentric cylinders with truss

structures bridging the gap between those cylinders and the outer structure having the same diameter as the OWS (21.6 feet). The inner cylinder contained the EVA airlock and the passageway that comes from the MDA leading to the OWS.



AM Basic Configuration from EP-107: Skylab, A Guidebook

The airlock, in the central portion of the tunnel, had two hatches that closed off each end of the central cylinder and the EVA third hatch in the outer wall. The tunnel also housed the controls for cluster pressurization and atmosphere purification, electrical power and communications, and the caution and warning system. High pressure containers stored the oxygen and nitrogen that provided the internal atmosphere and they were mounted between the fixed Airlock Shroud and the tunnel.

The AM evolved significantly from early designs, growing in complexity, function, and structural support for the rest of the cluster, which led to its final weight growing from less than 5,000 pounds to 49,000 pounds. The MDA and AM required extensive integration work be performed between the McDonnell-Douglas (St. Louis) and Martin Marietta (Denver) contractors.

5. Instrument Unit (IU)

The Instrument Unit, in a ring at the forward interface of the Saturn V second stage and the SIVB (third stage or in this case, the Skylab cluster) is 22 feet in diameter and 3 feet in length and weighs 4,600 pounds. This unit guided the Saturn V from liftoff through the separation of Skylab, remaining with Skylab to provide battery power to send commands to various Skylab systems (orbital positioning, refrigeration systems, Payload Shroud jettison, shield deployment, and oxygen pressurization). The IU was designed by Marshall Space Flight Center and manufactured by IBM. It became inert after battery lives were expended (7 ½ hours into flight).

6. Payload Shroud

The shroud or fairing protected the ATM, the MDA and part of the AM during launch to orbit and also protected the enclosed modules in the OWS from weather before launch. It was jettisoned in four segments after orbital insertion. The shroud required for Skylab was the largest one built up to that time. It weighted 25,600 pounds, was 56 feet in length and had a diameter of 21.6 feet. The shroud was built by McDonnell-Douglas Western division.

7. Supporting Systems

Skylab had many supporting systems, summarized below:

1. **Attitude and Control Pointing System (APCS):** This system, composed of rate gyros, measures the attitude rates, and derives vehicle attitude for rotating to predetermined attitudes, holding at desired orientations, and providing precision pointing for the ATM experiments. Control moment gyros were the primary mechanisms for executing maneuvers. A secondary maneuvering system was the Thruster Attitude Control System using gas thrusters.
2. **Electrical Power:** All of the electrical power for Skylab was intended to be generated by two sets of solar arrays (more on that situation later). The OWS had two solar array wings and the ATM had four wings. Under ideal full-sun conditions these sets of arrays would generate 23,000 watts. However, for actual periods of orbital darkness (1/3 of every orbit), the power was predicted to be reduced to 7200 watts total from the various arrays. The power system was self-contained for the OWS and ATM, but power sharing capability was provided. The AM housed the OWS power systems (batteries, chargers) and the ATM had power components in a rack in that module.
3. **Environmental and Thermal Control:** This system provided a breathable atmosphere inside Skylab and maintained the temperature within tolerable limits for the crew and equipment. Before the crew arrived, Skylab would be pressurized to 5 psi (pounds per square inch) with a mixture of nitrogen and oxygen (76%/23%), like Earth. Purification and humidity control relied on carbon dioxide removal equipment and water condensers, along with charcoal filters. The CO2 removal process was a design improvement over the Apollo systems, with a reusable system using two beds for absorption and removal. An active thermal control system was provided for times of non-occupancy.

4. Instrumentation and Communication: A 13-station internal communication system enabled the crew to talk to each other anywhere in Skylab or at an EVA station. Measurement systems were put in place with sensors to acquire information on systems and experiments; these various values were recorded or transmitted to the ground. Spacecraft-to-ground communication was done through the CSM and there were five TV cameras available on-board the cluster.
5. Habitability: The OWS contained provisions for feeding, clothing, personal hygiene, and waste disposal for the crews as well as living and working spaces. The habitability of Skylab will be discussed more in future articles about the crews.

8. *Experiments*

Skylab had over 70 experiments planned for the three manned missions in physical science (mostly involving the solar observatory in the ATM), biomedical science, Earth applications, and Space applications. Specifics about the experiments and results will be covered in the future articles about the manned missions. The number and complexity of the experiments grew over the years of development and many late experiments were added to the manifest.

9. *Command/Service Module*

Crews were flown to Skylab using the Apollo designed Command/Service module, built by Rockwell North American/International. The CSMs used for low earth orbit missions such as Apollo 7, the three Skylab missions and the Apollo-Soyuz Test Project were launched on a Saturn 1B. These CSMs were launched with less than half the full-Service Propulsion System loads because of the lesser capabilities of the Saturn 1B and the Skylab CSMs had other modifications due to their passive electrical operations and low-earth orbit locations.

10. *Launch Vehicles*

The crews were launched on Saturn 1B vehicles, a much smaller Saturn-family launch vehicle. The Saturn 1B will be described in further detail in the articles about the crew missions. Skylab itself was launched on a modified Saturn V, with the cluster replacing the normal Stage III of that launch vehicle. KSC Pads LC-39A and B were used for the Skylab program.

Skylab Testing and Integration

Some of the elements of Skylab were previously demonstrated during the Apollo program, but the program managers wanted to ensure that any new

equipment or repurposed systems were exhaustively tested. Two primary documents defined the Skylab test program: The mission requirements document specified exactly what each mission was to accomplish and the cluster requirements specification defined permissible materials, design, construction practices, and human engineering standards.

There were two main phases in the overall test program: Development tests were used by contractors to determine the best design trade choices and qualification tests were performed to demonstrate that a component was adequate for its intended function. Since almost everything on Skylab functioned as part of a larger system, compatibility was as important as reliability. As assembly of elements proceeded, systems tests were conducted at progressively higher levels of complexity. Some elements could not be properly tested, like the jettisoning of the Payload Shroud, the deployment of the ATM, or the unfolding of the solar arrays. Each of these operations was verified by analysis, testing with nonflight hardware, and simulations. Some contractors (McDonnell-Douglas, Martin Marietta) built neutral-buoyancy test facilities for their subsystems. Appropriate vibration and thermal vacuum tests were done on various elements before their shipment to the Cape. Integrated testing was done with all elements except the CSM in the Vertical Assembly Building at KSC.

Test teams from each element manufacturer were created to follow their elements through various phases of integration. This approach led to a more efficient test program as problems could be resolved with the right personnel in place. Quality and reliability requirements dictated that a failure-mode analysis also be conducted to screen out single-part failure modes in the designs. Quality also had considerable oversight over procurement functions.

For checkout purposes, the experiments on Skylab were divided into three groups based on complexity. Half of the experiments fell into the simplest category, which did not require continuous support from the developer or contractor. 40% of the experiments in the second group warranted continuous support from the developer and there were complicated interfaces with many of those experiments. Finally, about 10% of the experiments involved no functional hardware. The checkout of experiments fell to the element owner or contractor.

Launch Preparations and Launch of Skylab

In August, 1972, a visitor to the Vertical Assembly Building (VAB) at KSC would have noted the busy preparations in three of the cells in that building. Apollo 17 was completing its final tests before rollout, the booster for Skylab occupied a second bay, and the 39-

foot pedestal for the Saturn 1B was being processed in a third bay. The launch vehicles were certified in June, 1972, the CSMs certified in August, 1972 and the cluster systems certified on October 19, 1972.

The Skylab elements began to arrive at KSC after their design certifications in the fall of 1972 and the pace of work on Skylab quickened after Apollo 17 was moved to the pad. On September 15, 1972, a Skylab Mission Operations design certification review was held at Marshall Space Flight Center and the certification of all mission operational requirements was achieved, pending closure of any open action items.

The ATM arrived at KSC on September 22, 1972 and it was transported to the Operations and Checkout Building. The OWS arrived by NASA barge from Huntington Beach on September 23, 1972 and was mated on the forward end of Stage II of the Saturn V on September 28. Testing and verification of the meteoroid shield deployment on the OWS was problematic and it had to be "rigged" to properly deploy; some of the experiments had difficulties in end-to-end tests and many were replaced during these checkout operations. The finished AM/MDA arrived at KSC on October 6, 1972. Checkout of the AM/MDA and ATM flight units were completed on January 29-30, 1973 and those units were mated to the launch vehicle.

On February 14, 1973 the launch dates were finalized, with the Skylab cluster targeted for launch on May 14, 1973, followed by the first manned mission (SL-2) on May 15, 1973. The crew for SL-2 was designated long before launch and included veteran astronaut Pete Conrad and rookies Joseph Kerwin and Paul Weitz. The crew selection and training and their biographies are covered in the next writeup on the Skylab 2 mission. The Skylab 2 CSM, mated to the Saturn 1B, was transferred from the VAB to LC-39B on February 27, 1973. After additional reviews and tests, the Skylab 1 spacecraft and its Saturn V launch vehicle were moved to LC-39A on April 16, 1973. A countdown demonstration test was performed on April 26, with closeouts completed in the following days.

A flight readiness review was held at KSC from April 17-20 with a "go" for launches on May 14 and 15. A few lightning incidents occurred with the vehicles on the pad, but no damage or concerns were found. On May 14, 1973, Skylab 1 was launched at 17:30:00 UTC.



Launch of Skylab on the last Saturn V, May 14, 1973

Ten minutes after a picture-perfect liftoff, Skylab was in its planned orbit and the IU sent various commands to jettison the radiator cover, the payload shroud was jettisoned and the ATM deployed to its flight position astride the docking adapter from the forward end of the stack. The ATM solar arrays deployed and the cluster assumed a solar inertial attitude. The launch crew began to relax as events continued to unfold, dismissing a report from Houston that the micrometeoroid shield had deployed prematurely. Their relaxation was short-lived.

Skylab Anomalies

About 30 minutes after liftoff, JSC flight director Donald Puddy reported erratic signals from both the micrometeoroid shield and the OWS solar arrays. The deployment of the OWS arrays was scheduled for 41 minutes after launch. The team listened for news from the tracking station in Australia. Results were confusing: One telemetry signal indicated that the array had released for deployment but was not fully extended. Temperature signals suggested that both arrays were gone, a conclusion reinforced by the absence of voltage signals. Backup commands sent through two ground stations confirmed the worst fears.

By late afternoon of launch day, it appeared that Skylab had at least two major problems. If the OWS solar panels were indeed gone, Skylab had lost nearly half of its electrical power; the system had been designed with power to spare and an adequate manned mission might be possible until Apollo's CSM fuel cells ran dry. The more serious problem was barely discussed – the apparent loss of the micrometeoroid shield. The shield's secondary function was to provide thermal control; it had been designed to keep the OWS on the cool side, absorbing a desired amount of heat on its outer skin with a black and white pattern. Without the shield, the gold coating on the OWS would rapidly absorb excessive heat, making the interior uninhabitable. The loss of the shield was confirmed by launch analysts who noted an anomalous lateral acceleration one minute into flight, accompanied by increases in internal temperatures.

A decision was made to delay the launch of the first crew. Orbital maneuvers were implemented to try and increase

cooling of exposed areas of Skylab, but the rate gyro system was not functioning as required, resulting in excessive expenditures of nitrogen gas in the thrusters. Everyone at Mission Control wanted a "do over" but they were forced to deal with the situation at hand. Special task forces at Centers and contractors were implemented to study options and solutions. The thermal situation was the most critical requiring an immediate solution; the power problem was less of a concern, but would present challenges to the second and third crews and their planned longer stays.

So, what were the solutions? I love cliff-hangers, so I am going to discuss the orbital maneuvering and repairs that were formulated, the extensive hours that everybody worked to solve this, the eventual launch of the Skylab 2 (first) crew on May 25, 1973 (ten days after the planned date) and the inspections and EVAs that were required in the next article. The next article will also focus on the selection and training of Conrad, Weitz and Kerwin and the remainder of their time on Skylab before returning to Earth on June 22, 1973. The efforts to solve the problems were extraordinary and this first manned orbital workshop became a success.

Resources and Links

SP-4208 Living and Working in Space: A History of Skylab

<https://history.nasa.gov/SP-4208/ch12.htm>

SP-4011 Skylab: A Chronology

<https://history.nasa.gov/SP-4011/part3a.htm>

SP-701: Skylab, A Guidebook

<https://history.nasa.gov/EP-107/contents.htm>

Wikipedia Article about Skylab

<https://en.wikipedia.org/wiki/Skylab>

Skylab Program Description

<https://ntrs.nasa.gov/api/citations/20160013588/download/20160013588.pdf>

Next Edition

Skylab Part III – How do we solve a problem like Skylab? Also, the first crew, their repairs, their training/selection/biographies, a short story about the Saturn 1B and the habitation of Skylab by the Skylab 2 crew.

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

Bridge Club

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

Each month we hear of new MARS members thinking of joining bridge. There is no fee to join the Bridge Club. All MARS members and their guests are welcome. It is social, not tournament bridge, with light conversation while we play, and everyone seems to like it that way. We play on the **3rd Friday of each month at the Buck Community Recreation Center in Littleton from 10 AM to 2 PM.** The next quarter, we are scheduled to play on 21 July, 18 August, & 15 September 2023.

You'll need to pack a lunch, as we stop midday to eat and then resume playing after lunch, until about 2 PM. The club provides the cards and all required items for the games. A fee for the Buck Center is for the use of the room. An even smaller fee to the club is requested (which helps with supplies and the year-end Holiday party).

Come and join us by calling or emailing at least a week ahead, to reserve a place at the tables. There is always room for more players, as the room will accommodate 8 tables. Or, check out the MARS website under Clubs/Bridge Club, for more details.

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 2nd Quarter 2023 top winners are as follows:

21 March (5 tables)

N/S 1st – Leo Johnson & Joni Rosenberg

N/S 2nd – Dave & Kathy Martz

E/W 1st – Bill Kacena & Tammy MacCalous

E/W 2nd – Betty Hirst & Wayne Jackson

19 May (5 tables)

N/S 1st – Ernie & Cecile Berliner

N/S 2nd – George & MJ Eger

E/W 1st – Betty Hirst & Wayne Jackson

E/W 2nd – Curt & Phyllis Brudos

16 June (4 tables)

1st – Mark & Jan Ugale

2nd Tied – George & MJ Eger &

Dave & Kathy Martz

4th – Leo Johnson & Joni Rosenberg

Car Club

By Roger Rieger
(rrieger10731@gmail.com)
303-912-6217

Dave Ernst
(Dave.Ernst.157@gmail.com)
(303) 588-2747

Welcome to the Colorado monsoon season! Who ever thought that we would get more rain this spring than Seattle? Between all the rain, hail, threat of hail, TORNADOS (!) and just plain lousy weather, not much has been happening with the Car Club. Hopefully with some drier weather coming plans can get made and we can get our garage queens out on the road where they belong.

We did hold our 2023 Car Club kick off meeting Tuesday, 2 May, 3pm @ Prost Biergarten. A good discussion was had over some good cold bier (not too many!) and ideas for potential club activities for the 2023 season were tossed around. We also discussed the annual club car show which will be held in conjunction with the MARS picnic - Sept 13, Clement Park - mark your calendars! Also, weather permitting, we have resumed meeting at the Cornerstone Cars and Coffee which is held the first Saturday of each month, now in a new location by Park Meadows in the parking lot by Rio Grande Mexican restaurant.

Stay in touch with the Car Club through our MARS Car Club Facebook page, MARS Associates website link, or by contacting either Dave or myself to get added to our email distribution. 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 Dave or myself an email, we would love to have you!

Golf League

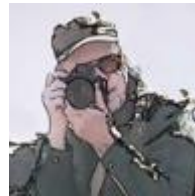


Sandy Mossman
(smoss5592@gmail.com)

Our golf league season thus far has had both good weather and bad weather but for the most part has missed the bad storms. The remaining season, from July through the month of October, should provide us good weather so we look forward to enjoying ten team events including variations of best ball: 2 team best ball, 4 team

2 best ball, 4 team Cha Cha Cha, 4 team Lone Ranger, 4 team Shamble, 4 team scramble) and four individual events (based on individual stroke play and Modified Stableford). On August 17th and 24th we will have our combined two week annual individual stroke championship tournament paying low net winners, closest-to-the-pin winners on all PAR 3 holes, and we will award the medalist trophy to the low gross score player. In order for a member to win tournament placement prize money (top six places) they must play in both weeks of the tournament. There is also a celebratory picnic scheduled post-golf in September for prize awards and socialization.

Our league has grown to 62 members (12 women and 50 men). If you and/or your spouse enjoy playing golf and would like to join our league, or experience play as a guest player, please feel free to contact me at the email addresses listed above. We encourage you to log onto our MARS website --www.marsretirees.org and click on "Golf" to get a complete update on our activities, membership and much more. You will see that our weekly results show women and men throughout our high-to-low handicap index system who have won prize money in varying flight categories.



Photography Club

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

The Mars Photo Club meets January, February, March, April, May, September, October, and November. We do not meet in June, July and August as many club members take this time to travel. In December we have a holiday luncheon at a local restaurant. Our next meeting will be September 14, 2023, via *Zoom*.

In April, we viewed a National Geographic Photography Instructional DVD. In May, Larry Stearns presented a photo documentary of his trip to Moab and Arches Monument, Utah.

The first place winners of the April and May photo competitions are: April: Maris Biela, *Juniper Trunk*, *Camanche National Grasslands*, Tom Frickel, Judge.



May: Larry Stearns, *Water Drop*, John Chapter, Judge



To see all the images, go to <https://marsretirees.org/clubs/photography-club/> and scroll down to competition entries.

Our regular meetings are held using the virtual *Zoom.com* format that we have been using because of the covid pandemic. The meetings include a member competition and a program. The winners' competition images, which First, Second, Third and Honorable Mentions, are posted on the MARS Retiree website. Judges vary monthly and include club members.

Please check our MARS Retirees Website (<https://marsretirees.org>) for the latest updates to the Photo-Club meetings. We always encourage new members to join our club.

Thanks, and regards, John Chapter and Jim Kummer

Colorado Springs Lockheed Martin Retiree Group News

By Doug Tomerlin
(dougincs@aol.com)

The Colorado Springs Lockheed Martin Retiree Group held a luncheon on April 6, 2023 in a private room at the Golden Corral in Colorado Springs. We had excellent attendance of 54. Everyone had a good time with several first-time luncheon attendees and a good number of retirees who had not attended a retiree luncheon for several years. We were honored to have in attendance Ken Marts, the president of MARS Associates, the Lockheed Martin retiree group in Denver, and Al Nemes, MARS secretary. Ken addressed the group discussing advantages of retirees joining MARS Associates. Many retirees stayed and visited with other retirees for a good while after everyone completed eating.

We were sad to hear that Larry Orth, one of our Colorado Springs Lockheed Martin retirees passed away in April, 2023. Our deepest condolences go to Larry's family and friends.

We welcome the following retiree, who joined the Colorado Springs Lockheed Martin Retiree Group since the last newsletter: Steve Wilde

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

Cape Canaveral News

By Dick Olson
(olson5145@aol.com)

Luncheons

May 2023 – Interesting discussions this month. Jeff Gorham was down from Georgia where he "is living the good life" and enjoying retirement. Caught up on all the guys that are still around and questioned the whereabouts of a bunch of others. Also joining us were Ron Price and Darrell Laws who we have not seen for ages. Roger Wright is back from Tenn. and has been on the phone getting people to show up. Materiel group was well represented. Regulars Wendell McDaniels, Lavern Jones, Don Bollinger, Larry Johnson, Cecil Snipes, and Bob Matschner made the scene.

Abe Smith was missing as he is on the beach in Jamaica with a drink with an umbrella in it.

Bob Rodamer asked me to say hi to everybody and to let them know he is still hanging in there and busy making some improvements to his garage area.

Today is Cinco de Mayo (sp) so go easy on the margaritas and don't forget Mother's Day on the 14th and a Happy Mother's Day to all you mothers.

June 2023 -- Light but talkative turnout this month. Present were Don Bollinger, Abe Smith, Roger Wright, Cecil Snipes, Lavern Jones, Sylvia Sansing and Larry Johnson. The main topics were our various aches and pains and summer plans. Abe discussed his recent trip to Jamaica and the resort they visited, Lavern is planning a trip to the Washington DC area and Roger had pictures of tuna on the hook 90 miles offshore.

Could not locate anyone who remembered a Dick Rhinehart working on Titan and Dave figured he must have been thinking of Charlie Rhinehart so did not add him to our deceased list.

Hope everyone has a great summer,

July 2023 -- A really light turnout this month. Present were Wendell McDaniels, Abe Smith, Don Bollinger, Cecil Snipes and someone we haven't seen for a while, Dave Kintigh

Heard from Danny Wyatt and he and his family are moving to Tennessee.

Bob Matschner is spending the summer at their place in the keys and hoping for some good fishing.

Cecil talked to Butch Ford and plans for services for Letha have not been firmed up as yet.

Bob Rodamer is hanging in there. He was even out on the lawn mower when I stopped by earlier this week.

Hope everyone had a good 4th and have great summer and try to stay cool.

Recent Obituaries

Syble Harris, 93, wife of John Harris, passed away on 18 March. They were childhood neighbors and knew each other from the age of three.

George Pestik, 89, passed last November in Punta Gorda, FL. George worked for Martin in the Systems Engineering Electrical Group. He along with Norm Roulston and George Meyers were one of the most capable group of electrical engineers that I ever had the pleasure of working with.

James (Jim) Rivers, 85, passed away on 5 June. He managed the Titan 4 major element contractors (Aerojet, MDAC, Delco, etc.) and was the deputy program manager.

Letha Ford, 70, passed away on 29 June. Letha, wife of Butch Ford, worked in the MRL in the IR Dept. and has been in poor health for some time.

Martin Marietta Retiree's Club (Vandenberg AFB News)

By Peggy Isaacs

peggy.isaac@comcast.net

Our group meets monthly on the fourth Thursday for an informal lunch at 12:00 at the Mission Club in Vandenberg Village, California. It's a time of sharing past memories of our working days as well as just enjoying each other company. We encourage everyone to bring their spouses as well. We recently have invited all retired contractors to join us and share in this special time together. See page 22 for luncheon photos.

Lockheed Martin (LM) News

Lockheed Martin on Blue Origin's National Team Selected to Develop Human Lunar Lander.

DENVER, May 19, 2023 – Lockheed Martin [NYSE: LMT] is on the team that has won a [contract](#) from NASA to develop and demonstrate a human landing system for the Artemis program under the agency's Human Landing System program. The goal of the program is to rapidly develop a sustainable human lunar lander and perform a crewed demonstration flight to the lunar surface for Artemis V.

Led by [Blue Origin](#), the National Team that will develop and build the lander also includes Draper, Boeing, Astrobotic and Honeybee Robotics.

"Congratulations to Blue Origin on this achievement. LM is excited to be part of Blue Origin's National Team and we are looking forward to building humanity's first Cislunar Transporter," said Kirk Shireman, vice president of Lunar Exploration Campaigns at LM Space. "We value Blue Origin's thoughtful approach to developing human-rated flight systems and are thrilled to be part of a diverse team that combines innovation, deep experience and a strong industrial base."

NASA's Artemis program is redefining how we explore deep space, and a sustainable human landing system program is key to extending our human presence away from Earth in a long-term way, which will greatly add to our scientific knowledge of the solar system.

As a principal partner on Blue Origin's National Team, LM brings to the lunar lander effort more than 50 years of experience in space exploration – from developing the Orion spacecraft, to supporting numerous planetary robotic missions, to developing the space shuttle's

external fuel tank. Additionally, LM and National Team partners are drawing on their extensive supplier base, engaging strategic small and mid-sized businesses across the country in the development of the landing system.

LM Space Announces Changes Designed to Enhance Speed and Effectiveness

Business area doubles down on providing customers with advanced space capabilities through innovation, productization, mission assurance

DENVER, May 4, 2023 – The Space business area within LM (NYSE: LMT) today announced upcoming changes in order to promote greater effectiveness in delivering on customer missions, support growth and innovation, and create stronger collaboration with customers, suppliers, and partners. The realignment follows the recent establishment of LM Space’s Ignite organization, an innovation hub for rapid capability development.

“With an eye toward the future and building on our current business momentum, these changes position us to deliver end-to-end solutions for today’s mission demands and well into the future,” said Robert Lightfoot, executive vice president, LM Space. “I’m both excited about this next chapter and confident in our team’s ability to unlock new and enhanced impact for our customers.

What is Changing?

As Space capabilities continue to be a critical enabler within the battlespace and global economy, the industry is seeing significant movement in customer requirements, a renewed competitive environment, and a shift in the pace and urgency to address emerging threats.

To meet these needs, LM Space will transition from five lines of business to three, better enabling the business to deliver 21st Century Security capabilities and pursue innovation, exploration, and discovery missions.

- **Commercial Civil Space** will continue to include scientific discovery and exploration missions, while focusing on space infrastructure development.
- **National Security Space** will be a new line of business that incorporates classified and defense portfolios, aligning programs that support military space, mission solutions and special programs customers.
- **Strategic and Missile Defense Systems** will continue to include strategic deterrence, missile defense and hypersonic programs.

This new National Security Space team will be led by Vice President and General Manager Maria Demaree, who holds a proven track record leading LM Space’s classified and defense portfolio and brings companywide experience across domains and customer missions. Her experience also includes leading LM’s enterprise JADC2 corporate initiative, in which Demaree oversees the ongoing imperative for modernized capabilities enabling customers to sense, make sense and act quickly—regardless of their branch of service. In this capacity, she leads the development of an integrated product strategy across the company’s business areas.

During this transition, Johnathon Caldwell, vice president and general manager of Military Space, and Stacy Kubicek, vice president and general manager of Mission Solutions, will remain in their current roles and serve as strategic advisors working closely with Demaree on the creation and shaping of the new National Security Space organization.

LM Space will also stand up a **Product Center** focused on driving affordability and marketability of LM Space products for internal and external customers. It will be led by Mike Patton, who previously ran LM Space Operations and brings a career in production expertise from GE.

LM Space will transition into this new organizational alignment over the coming months.

United Launch Alliance (ULA) News

Vulcan: Preview of the Flight Readiness Firing



United Launch Alliance's Vulcan Certification-1 rocket undergoes the Flight Readiness Tanking Test (FTT) at Space Launch Complex-41 at Cape Canaveral Space Force Station. Photo by United Launch Alliance

United Launch Alliance (ULA) is preparing for the Flight Readiness Firing (FRF) of the Vulcan rocket as a validation

of the fully integrated vehicle at Cape Canaveral Space Force Station, Florida.

FRF demonstrates the day of launch timelines and procedures, propellant loading operations and the entire countdown through ignition of the twin booster engines at Space Launch Complex (SLC)-41.

"FRF is really about confirming the operational readiness of the integrated system: launch vehicle, ground systems, facilities and the associated software. In addition, we will demonstrate the ability to successfully execute the engine start sequence and validate our hot-fire abort response procedures," said Dillon Rice, ULA's Vulcan launch conductor.

Extra instrumentation is placed at strategic locations in addition to the normal vehicle sensors as an enhancement of the data collection during FRF.

Engineers will study temperatures, pressures, and other parameters while controllers monitor vital signs from Vulcan and send commands to the rocket and pad systems from the launch control center at the Advanced Spaceflight Operations Center (ASOC). The countdown matches normal launch day timelines and activities except the Certification-1 (Cert-1) mission payloads are not aboard nor involved.

FRF is one of the most dynamic ground tests performed at the launch site. The team will complete post-abort safing procedures and begin detanking operations following the test.

VandenbergAFB Retirees informal lunch at the Mission Club in Vandenberg Village, CA



(L) Charlie Radaz, Rod McCarthy, Russ Sharer, Carolyn Masterson, Allen Surgi, Gary Foss (R) Ann Kuczkowski, Mark Kuczkowski, Jim Blashke, Allan Isaac, Mike Milligan



(L) Mike Milligan, Margo Milligan, Allan Isaac, Jim Blashke, Mark Kuczkowski, Ann Kuczkowski (R) Gary Foss, Allen Surgi, Eunice Souder, Russ Sharer



Eunice Souder and Carolyn Masterson



Allan Isaac, Jim Blashke, Mark Kuczkowski



Join Us for the Annual Rite of Summer....

2023 MARS ANNUAL PICNIC

The Officers and Directors of MARS Associates invite you, your spouse or companion, and your friends to celebrate the end of summer with an old-fashioned barbecue picnic complete with BBQ ribs, pork, chicken, and brisket plus all the trimmings, provided by Smokin' Outlaw Kitchen. There will also be cookies, ice tea, lemonade, water, wine and beer, and door prizes. The event will be **Wednesday, September 13, 2023**, at **Clement Park**. The event will be in Pavilions A, B, and C located on the east side of the park (map of the park is on the reverse side). The event will be held rain or shine. **The BBQ line will open at 12:00 noon.**

Special dietary needs? Please contact Linda Duby at 303-249-1665 or lindaduby@comcast.net with the details.

The cost of the picnic is \$25.00 per person for members and spouse/companion and \$30.00 per person for non-MARS guests. **There are two payment options.** To pay by check, please complete the form at the bottom of this flyer and mail it in with your check (**made payable to MARS Associates**) to the address on the form. To make your reservation and pay electronically, please click the link below or visit the MARS website at <https://marsretirees.org>.

STRIPE (ctrl+click): <https://marsretirees.org/2023-mars-annual-picnic/>

Reservations and cancellations must be received by September 2, 2023. If you must cancel, please notify Linda Duby at 303-249-1665 or lindaduby@comcast.net; Carl Kaminski at 303-726-1546 or carlkc66@gmail.com; or Charlie Haupt at 303-725-7595 or gcrfccoach@gmail.com. Please notify one of these persons **by September 2 to receive a refund.** Admission is by reservation only. Pick up name tags and drawing tickets as you enter the picnic area. The name tags will be available at 11:00 a.m.

----- **Reservation Form (detach here)** -----

2023 Annual Picnic Reservation Form – September 13, 2023. Please print clearly.

Mail to: MARS Associates, PO Box 1128, Littleton, CO 80160-1128

Member _____ Spouse/Companion _____

Non-MARS Guests _____

Member Phone No. _____ Email address _____

Member/Spouse or Companion @ \$25.00 per person = \$ _____

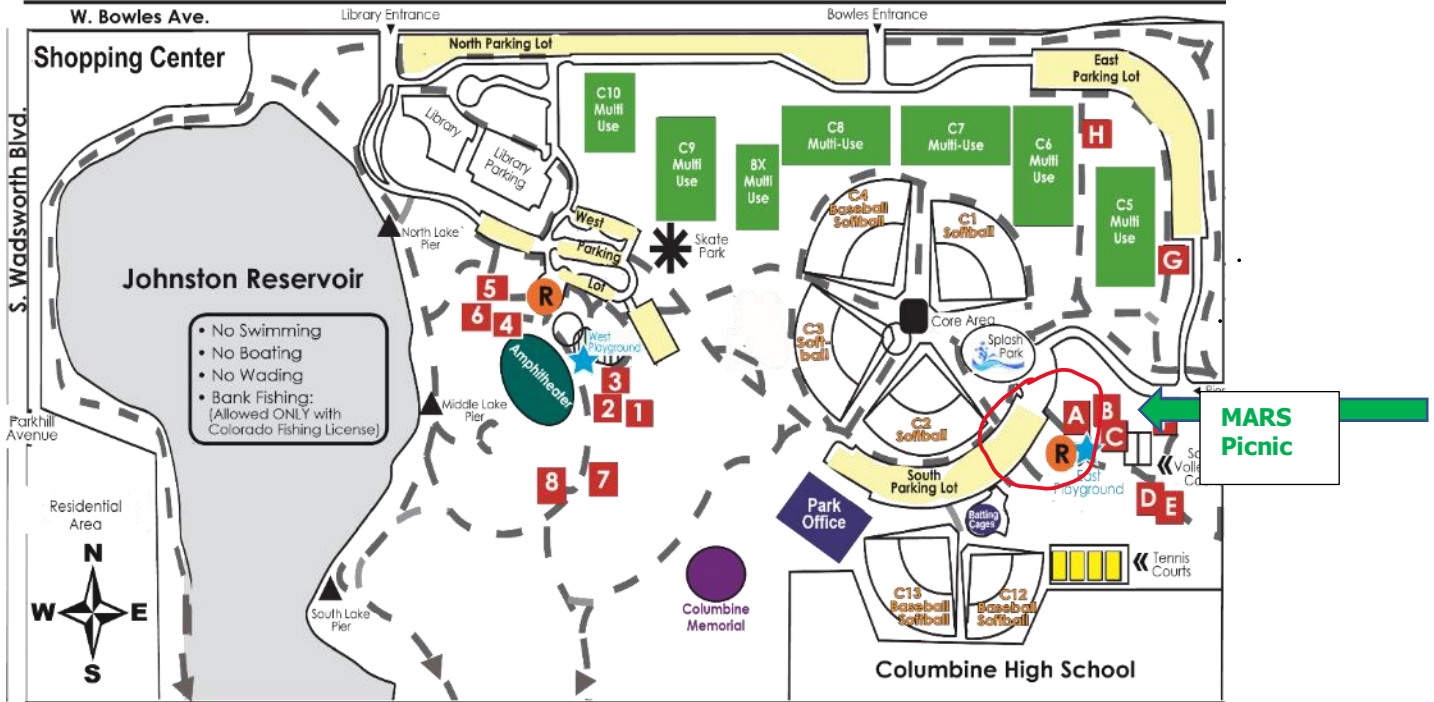
Non-MARS Guests @ \$30.00 per person = _____

Total enclosed \$ _____ Check Number _____

Robert F. Clement Park

7306 W. Bowles Avenue • Littleton, CO • 80123

Foothills
Park & Recreation Dis



The picnic will be held in Pavilions A, B and C.

MARS Members had the
pleasure of
experiencing a tour at
Cherokee Castle &
Ranch on 16 May



Tour Leader Pete Munoz



View of the Castle



View of the South Patio



Group Gathering



L to R - Jo Lynn Blackwell, Sueann Smith, Jo Green & Carolyn Malaby



L to R - Vicky Ellis, Donna O'Neill, Cookie Steen, Sandy Thimmig, Warren 'Moon' Luckow, Lucy & Dan Ellerhorst



Turret Patio View - Warren 'Moon' Luckow, Lucy Ellerhorst & Sandy Thimmig



Lunch Photo - Left Side - bottom to top - Heidi & Kevin Urie; Charlie & Glenda Haupt; Maureen & Ronald Gedeon. Right Row - Top to Bottom - Mike Bartlett; Sue Ryan; Jane Baumann; Cheryl & Ken Marts; Annette Marstiller; Marsha Davis



Left - Top to Bottom - Heide Urie; David & Erin Bourcier; Deborah & Kent O'Kelly. Right side from bottom to top - Vicky Ellis, Deborah O'Neill, Cookie Steen, Shar Petty, Marsha Davis & Annette Martstiller



Group Introduction



Luncheon Photo - Left side, bottom to top Warren 'Moon' Luckow & Sandy Thimmig; Lisa Cox. Right side, bottom to top - Linda Duby, Lucy & Dan Ellerhorst

Manitou Cog Railway

Pikes Peak train trip, was a 3-hour tour -- an exciting 9-mile ride up to the top of Pikes Peak at 14,115 feet elevation!

The trip was held on 8 June



Pikes Peak from Garden of the Gods



Ken & Cheryl Marts, Carolyn Malaby



Mark Nash, Robin Zen, Sherwin Zalman, Glenda Florea



Larry & Linda Stearns



Bob & Linda Berry



Our Train at The Top of Pikes Peak



Ken Marts, Al Nemes, Marilyn Nemes, Robin Zen, Horace Clair, David Clair, Mark Nash On Top



Cheryl Marts, Diana Belfiore & Richard Martinac, Ken Marts, Jim & Judy Hardy At the Top



Beth Worthington, Glenda Florea, Shar Petty at the Top



Gloria & Dave Schwiesow On Top



Crystal Park Cantina: Linda Stearns, Marilyn Nemes, Tom Booth, Luanne Sosnay, Dick Sosnay, Cheryl Marts, Al Nemes, Larry Stearns



At Crystal Park Cantina: Front table - Carolyn Malaby, Susan Smith, Marjorie (Jo) Green, Ken Marts: Back table - Glenda & Charlie Haupt, Cookie Steen, Donna & Bill O'Neill, Georgia & David Stealy

IN THE NEWS

Compiled by Pete Harrigan

The following news headlines are drawn from open-source publications, as noted parenthetically. Click on the hyperlink to access the full article. Please note that some links may not work for all readers. Some sites may require a paid subscription or a login for free access. Other paywall sites may limit the number of free articles you are able to access each month.

CORPORATE NEWS

Lockheed Martin (LM) taps [strong defense demand](#) to beat estimates (Reuters)
LM [CEO sees "strong position"](#) amid U.S. defense boom (FlightGlobal)
LM [wrestles with supply-chain issues](#) to arm Ukraine (The Wall Street Journal)
[Pension risk transfer activity](#) hit record high in 2022 (S&P Global)
LM is latest U.S. issuer to tap bond market; [debt now exceeds that of its closest rivals](#) (Dow Jones/MarketWatch)
LM declares [third quarter 2023 dividend](#) (Company news release)
LM raises [concerns over L3Harris-Aerojet deal](#) (Reuters)
Raytheon, LM [executives banned from China](#) (Reuters)
At mega-contractors like Raytheon, Moderna and LM, [diversity remains a challenge](#) (USA Today)
U.S. [corporate jet spending jumps](#) as executives keep pandemic-era perks (Financial Times)
U.S. defense companies [sued by Yemenis](#) over weapons used in civil war (Navy Times)
How the Pentagon falls victim to [price gouging by military contractors](#) (CBS News)
Bipartisan [senators call for probe](#) into reports of price gouging by defense contractors (The Hill)
Opinion / Sen. Warren warns against [Pentagon-defense industry revolving door](#) (Military Times)
Industry [criticizes UK defense procurement](#) for lack of "deadline mentality", investment (Breaking Defense)
LM teams with New York chipmaker to [onshore production](#) (Defense News)
LM forms new company around [hybrid airship efforts](#) (Manufacturing Business Technology)
LM Ventures exec. explains why it's [doubled in size](#) – what that means for small def. contractors (The Business Journals)
LM's venture capital arm is [dabbling in island-hopping seaglidors](#) (Forbes)
LM [investment allows Regent to expand](#) into defense manufacturing (Providence Business News)
LM, Raytheon invest \$12.5 million in [3D printing firm](#) Fortify (Breaking Defense)
LM [design center coming to St. Paul](#), bringing more than 100 jobs (StarTribune)
Opinion / Why [young people are turning away from aerospace](#) (Aviation Week Network)
Mars, missiles and hypersonic weapons: LM celebrates [six decades in Huntsville](#) (AL.com)

SPACE SYSTEMS NEWS

LM announces [reorganization of its space business](#) (Space News)
LM sets up Skunk Works-like [fast-track space unit](#) (Aviation Week Network)
NASA prepares for [return of asteroid sample](#) after breakthrough 7-year mission (New York Post)
Prodded by GAO, Space Force [reconsiders future military-use GPS constellation](#), receivers (Breaking Defense)
GAO flags [concerns about Space Force satellite procurements](#) (Space News)
Space Development Agency's [missile warning satellites transmit first images](#) (Space News)
NASA selects Blue Origin team to develop [second Artemis lunar lander](#) (Space News)
[Technical strengths and lower cost](#) led NASA to select Blue Origin lander (Space News)
LM, Raytheon selected to compete to develop [ground systems for nuclear-hardened satellite communications](#) (Space News)
LM to collaborate with U.S. Army to [improve space-related defense systems](#) (SatNews)
LM selected by Australia for [military satcom project](#) (Space News)
U.S. [defense companies find roadblocks](#) in selling space technologies to allies (Space News)
LM declares success demonstrating tech for [in-orbit satellite servicing](#) (Space News)
Space Force eager to [harness satellite-servicing technologies](#) (Space News)
Video: LM [cubesat demonstrates rendezvous maneuvers](#) (Aviation Week Network)
Astroscale and Momentus offer [concept for reboosting Hubble](#) (Space News)
U.S. Air Force seeks [next-gen Sentinel ICBM reentry vehicle](#) (The Defense Post)
Firefly to [launch LM small-satellite](#) experiment (Space News)
Space Force in wait-and-see mode as [ULA continues to investigate upper-stage anomaly](#) (Space News)
ULA conducts [static-fire test of Vulcan](#) Centaur rocket (Space News)
First [Vulcan launch further delayed](#) for Centaur modifications (Space News)
ULA's [Delta 4 Heavy launches classified spy satellite](#) (Space News)
ULA's [Delta rocket assembly line falls silent](#) (Spaceflight Now)

Space Force [splits 12 missions](#) between ULA [and](#) SpaceX (Aviation Week Network)
The next [battle for U.S. military space launches is](#) about to begin (Space News)
Upcoming [national security space launch competition](#) open to heavy, superheavy lifters (Aviation Week Network)
Lawmakers raise [concerns about new plan](#) to procure national security launch services (Space News)
SpaceX to take over [West Coast launch pad previously used by ULA](#) (Space News)
"Lockheed in Sunnyvale" exhibit highlights how [company changed the city](#) (The Mercury News)
Top [space execs to watch in 2023](#): LM Space's Stacy Kubicek (Washington Exec)

AERONAUTICS NEWS

Pentagon to [halt upgraded F-35 deliveries](#) in July amid software woes (Defense News)
LM says F-35 upgrade delays will lead to [fewer 2023 deliveries](#) (Defense News)
LM eyes locking down [next F-35 production agreement](#) by end of year (Breaking Defense)
GAO urges Congress to [separate engine upgrade from F-35 program](#) (Air & Space Forces Magazine)
LM [backs next-gen engine for F-35](#), drawing rebuke from Pratt (Aviation Week Network)
Raytheon lobbyist blasts LM executive for supporting F-35 re-engining (Aviation Week Network)
As LM and Pratt trade barbs, [F-35 JPO insists engine upgrade is best option](#) (Air & Space Forces magazine)
Auditors: [Future F-35 cooling needs unknown](#) as DoD eyes engine upgrade (Defense News)
Overheating F-35s may get [service-specific cooling upgrades](#), likely hiking cost (Defense One)
LM [aiming for maximum "margin"](#) for F-35 cooling, power (Aviation Week Network)
Pentagon awards [\\$7.8 billion F-35 contract](#) to LM (Reuters)
LM wins [\\$1.4 billion contract to develop critical F-35 capability](#) (The Defense Post)
LM eyes [performance-based logistics deal](#) for F-35 by end of 2023 (Defense News)
LM eyes [new F-35 parts deal](#), but can it handle wartime demands? (Defense News)
Auditors: Over [1 million F-35 spare parts lost](#) by DoD, LM (Defense News)
"Just in time" [F-35 supply chain too risky for next war](#), general says (Defense News)
How maintainers at Hill Air Force Base found a [cheap way to make the F-35 even better](#) (Air & Space Forces Magazine)
Opinion / The U.S. must [maximize F-35 production](#) (Defense News)
Opinion / The war on wasteful spending: [F-35 funding fight returns to Congress](#) (The Hill)
UK says LM, BAE Systems win nearly \$200 million [F-35 support contract](#) (Reuters)
LM prepares to bring undisclosed country into F-35 program (FlightGlobal)
[Israel to buy 25 LM F-35 jets](#) in \$3 billion deal (Bloomberg News)
U.S. State Department clears \$5.6 billion [sale of F-35s for Czech Republic](#) (Defense News)
U.S.-Finnish defense pact could bolster [Nordic F-35 footprint](#) (Defense News)
[Romania announces it will buy F-35s](#), in the shadow of "Russian aggression" (Breaking Defense)
[Keeping the F-22 credible](#) through 2030 will cost at least \$9 billion, USAF leaders say (Air & Space Forces Magazine)
F-22s marked for retirement will [never be combat worthy](#), general says (Defense One)
Kendall optimistic about [OK from Congress for fighter cuts](#) (Aviation Week Network)
U.S. to help [train Ukrainian pilots on F-16](#) (Aviation Week Network)
LM says it is on standby to [train Ukrainian pilots on F-16s](#) (Newsweek)
Taiwan says [F-16 deliveries delayed](#), working to minimize damage (Reuters)
LM [delivers second F-16 to Bahrain](#) as production increases (Aviation Week Network)
Sale of [F-16s to Turkey could spur Senate retaliation](#), Menendez says (Aviation Week Network)
Air Force plans to [retire U-2 spy planes](#) in 2026 (Air Force Times)
LM to study [if C-130J-30 is ready for Tacamo role](#) (Aviation Week Network)
On the Paris tarmac, [execs vie for the next U.S. tanker order](#) (Defense One)
LM, Airbus expect U.S. Air Force to [increase short-term tanker buy](#) (Aviation Week Network)
LM picks [GE engines to bolster interim tanker case](#) for U.S. Air Force (Defense News)
Northrop Grumman, LM, Raytheon team up on [Navy's E-XX "doomsday" plane](#) (Defense News)
U.S. Air Force plans to award [Next Generation Air Dominance](#) deal in 2024 (Defense News)
X-59 gets its tail in Quesst for [super-quiet, super-fast planes](#) (Space Daily)
NAS Jacksonville hosting [sundown ceremony for P-3C aircraft](#) end of its service (CBS 47 Action News Jax via Yahoo News)

MISSILES AND FIRE CONTROL NEWS

U.S. [Patriot missile](#) is an unsung hero of Ukraine war (The Wall Street Journal)
U.S. approves \$15 billion in [Patriot and missile defense upgrades for Poland](#) (Reuters)
Lawmakers want U.S. to provide [Army Tactical Missile Systems to Ukraine](#) (Defense News)
[U.S. considers long-range ATACMS missiles](#) to boost Ukraine's fight (The Wall Street Journal)
White House greenlights Army plan for [Patriot missile and GMLRS multi-year buys](#) (Breaking Defense)
Pentagon to [spend up to \\$7.2 billion on combat-proven Javelin](#) anti-tank missiles (Stars and Stripes)

LM wins [\\$4.8 billion guided rockets contract](#) (Defense News)
 U.S. Army awards LM missiles [contract worth up to \\$4.5 billion](#) (Reuters)
 LM awarded huge [JASSM and LRASM build contracts](#) (Airforce Technology)
 U.S. Army awards LM [\\$615 million HIMARS launcher contract](#) (The Defense Post)
 Hungary responds after U.S. [senator says he blocked HIMARS purchase](#) (Defense News)
 U.S. approves potential sale of [HIMARS rockets to Morocco](#) for an estimated \$524 million (Reuters)
 Poland gets [first U.S.-made HIMARS rocket launchers](#) amid concerns over war in Ukraine (ABC News)
 Poland [buys 800 Hellfire missiles](#) to arm its new attack helicopters (Defense News)
 LM and Rheinmetall to develop [German version of HIMARS](#) rocket launchers (Reuters)
 Aerojet to develop [propulsion solution for LM's long-range missile](#) (Reuters)
[Weapons makers can't hire enough workers](#) as Ukraine war drives demand (The Wall Street Journal)
[Demand booming](#) for LM's Grand Prairie-based missiles division (The Dallas Morning News)
 LM looks to [boost LRASM production](#) as U.S. rushes to buy anti-ship weapons (Air & Space Forces Magazine)
[Sniper advanced targeting pods](#) approved for sale to Poland by U.S. (Airforce Technology)
ROTARY AND MISSION SYSTEMS NEWS
 Sikorsky [won't sue U.S. Army](#) after GAO rejected protest over future helo (Defense News)
 Sikorsky spins up to [defend HH-60W combat rescue helicopter from planned cuts](#) (Breaking Defense)
 CH-53K heavy-lift helicopter program prepping for [2025 first deployment](#) (Defense News)
 Industry eyes Ukraine war to [sharpen proposals for NATO helo fleet](#) (Defense News)
 Sikorsky still [eyeing Germany for CH-53K](#) sale, despite Chinook deal (FlightGlobal)
 Sikorsky to reveal [UK New Medium Helicopter production plans](#) once requirement set (Breaking Defense)
 Army's [future attack helicopter](#) analysis unlikely to alter program (Defense News)
 LM is [paying millions for overruns](#) on Pentagon's missile defense radar (Bloomberg News)
 LM paces [JADC2 information-sharing](#) at Northern Edge (C4ISRNet)
 LM eyeing plans to [keep SPY-1 radar active](#) in fleets globally through 2060 (Breaking Defense)
 Space Force may seek [new bidders for future deep-space radars](#) (C4ISRNet)
 LM developing [new, larger Vertical Launching System](#) for DDG(X) (Naval News)
 Royal Navy to [outfit new frigates with Mark 41 Vertical Launch System](#) (The Defense Post)
 LM to fit [electronic warfare kits on Strykers](#), plan for AMPVs (Defense News)
 Ransomware attack hits shipyard, results in [delay of frigate, Freedom-class LCS construction](#) (U.S. Naval Institute News)
 Major shift comes to Fincantieri Marinette Marine as [Freedom-class LCS line ends](#) (U.S. Naval Institute News)
 Future [LCS Cleveland launches, strikes tugboat](#) (Navy Times)

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 1st Sat of every month, and as noted on their website.
 5. Golf club meets every Thursday from April through Oct of each year.
 6. Hiking Club: Outings on 3rd Wednesday of the month. Check website for Point of Contact for each hike.
 7. Photo Club meets 2nd Thursday every month (except Jun, Jul & Aug) at 1:00 pm on Zoom
 8. Marketing Committee meets on a monthly basis as determined by members with guests invited (Typically last Wednesday)
 - *9. 2023/2024 Happy Hour Dates and Locations are tentative; MARS website will have details when available**
 10. 2023 Summer Event and Senior Recognition Luncheon - July 12, 2023 at Ken Caryl Manor House
 11. 2023 Annual Picnic -Sep 13, 2023 at Clement Park
 12. 2023 Holiday Celebration - Dec 6, 2023 at Wellshire Events Center
 13. Spring Event and Annual Meeting 2024 TBD
 - 14. See MARS website (<https://marsretirees.org>) for additional information on our Special Activities**
 - 15. Aug 16 Medicare presentation is at 9 AM at Red Rocks Credit Union (8195 SouthPark LaneLittleton, CO 80120)**
- Please review dates and times and notify Ken Marts (martshouse2@aol.com) if you have any changes or additions.



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EVENT/MONTH							2024					
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
Officers/Directors	5	1	6	4	1	5	3	7	6	3	1	5
Bridge Club	21	18	15	19	17	21	19	16	15	19	17	21
Car Club	1	5	2	7	4	2	6	3	2	6	4	1
Golf Club	Thur	Thur	Thur	Thur	-	-	-	-	-	Thur	Thur	Thur
Hiking Club	19	16	20	18	15	20	17	21	21	17	15	19
Photo Club	-	-	14	12	9	14	11	8	14	11	9	13
Website Team	as-needed	as-needed	as-needed	as-needed	as-needed	as-needed	as-needed	as-needed	as-needed	as-needed	as-needed	as-needed
Marketing Committee	26	30	27	25	29	TBD	TBD	TBD	TBD	TBD	TBD	TBD
MARS Events												
Happy Hour				TBD				TBD			TBD	
Summer Luncheon Honoring Senior Members	12											
Annual Rockies Game		2										
Annual Picnic			13									
Holiday Celebration						6						
Spring Event and Annual Meeting									TBD			
MARS Special Activities NOTE 17												
Kaiser Medicare Presentation		16										
LM Plant Tour		10										
Central City Opera	26											
Wild Animal Sanctuary	19											
WWII Museum of Aviation		17										
Wine Tasting			TBD	TBD								
MARS STAR Schedule												
Items due for MARS STAR												
STAR Input to Editor	6			5			TBD			TBD		
STAR Repro. Deadline	17			16			TBD			TBD		
STAR Mailing	26			25			TBD			TBD		