

LARK NEWS March 2023



Livermore Amateur Radio Klub LARK is an ARRL affiliated club dedicated to Public Service Volunteer Emergency Communications.

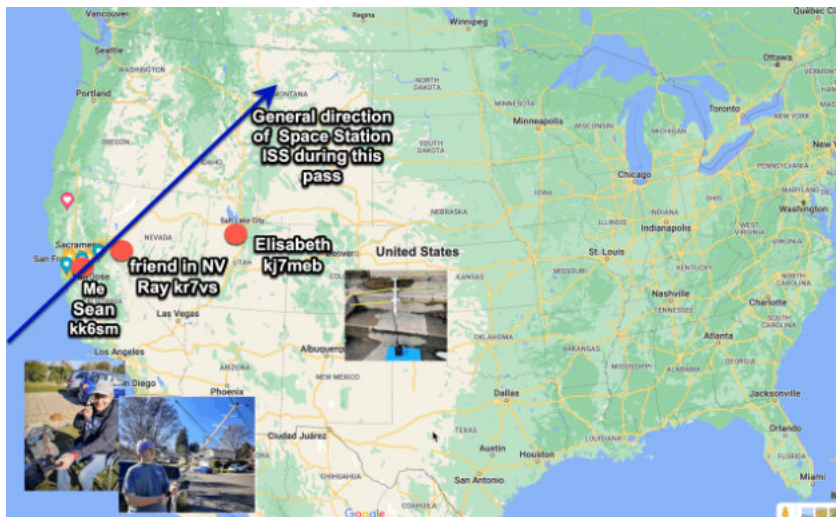
Meetings are once a month on the 3rd Saturday 9:30AM

***NEW VENUE: City of Livermore Meeting Hall
1016 S. Livermore Ave., Livermore CA 94550***

Available live via zoom by invitation only. Visitors Welcome

Editor: Roberto Sadkowski K6KM

Satellite Contacts



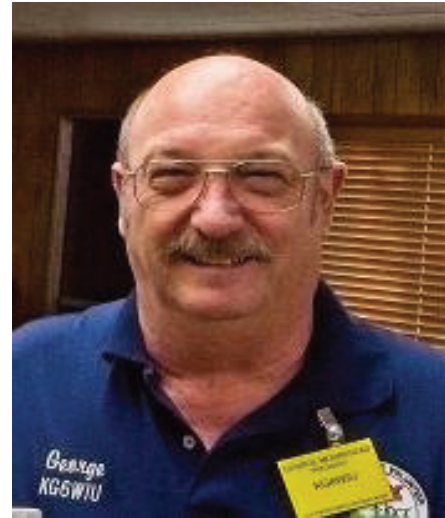
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President's Message

I want to take this time to thank Bernie NJ6W for making the coffee and picking up the refreshments for monthly meetings and would like to have someone help him if possible. I also want to thank Lee KI6OY for his presentation at this month's meeting (February). I wanted to let you know that the Events Chairperson (me) is following the upcoming events for 2023, and I have an update: the following events will be happening: Livermore's Half Marathon on Sunday, March 5th, and Cinderella on Saturday, April 15th, and an event LARK members help on is the Berkeley Hills Road Race on Saturday, April 29th and ham coordinator is Mark Walsh (contact him directly), and the Devil Mountain Run on Sunday, May 7th in Danville. If you can support these events, it will be greatly appreciated. As more events become confirmed you will be kept advised. Make sure to sign up on the LARK website for these events for which LARK supports. I wanted to thank Ron AD6KV and VE Team for continuing to provide a way for hams to get their testing completed.

Ian W6TCP continues to work on enhancing the repeaters for use by all of us so please report any issues to Ian by email. We will be holding our annual LARK elections soon as per the LARK By-Laws and will present the officers and board members nominations in the Newsletter and during the monthly meetings. Thank you for those persons



who have continued to show support for the LARK club as officers and board members and chairpersons and you the members, it takes all of us. I encourage you to check in with the LARK Monday, Wednesday (10.10 Windfarms Net), and Thursday night nets, held every week. There are other nets available, and they can be found on the LARK website It is good experience getting on the air. I want to thank Ed Diemer for coordinating the weekly nets. By participating in the nets, you'll hear what is going on in our Ham community We are meeting In-Person at the Livermore City Meeting Hall each month on third Saturday, and we are also offering the meeting on Zoom for those who prefer that way to attend. Wishing you all to please stay healthy and safe.

George KG6GEM
(kg6wui1@comcast.net)

Notes from the Editor

Wow! What a LARK Newsletter Edition! 40 pages of juicy content. Reserve your weekend for going through this material. And all contributions from LARKers like You. Thank You!!!

It's been a very busy month with better weather (for a change). I managed to activate 12 SOTA peaks around the Bay Area. It was about time! One of them with Brian N6IZ who lives in Los Gatos. We activated Black Mountain and Ben



Lomond up on the Santa Cruz Mountains. With Dave: K3GX we had great weather here in Livermore at Brushy Peak scoring DX QRP.



As soon as the weather cooperates we will have our second SOTA/POTA LARK activation day. Hope to see many of you

dusting off your equipment and joining us for some outdoor fun.

Bouvet has come and gone and a lot of Hams have been disappointed by not being able to copy their



signals. Their stories are typical of adventures to very harsh and inhospitable places in the planet. You work hard preparing and planning but reality catches up with you. We cannot be less than grateful for their effort. The previous DXpedition didn't even make it to the Island.

LARK elections are coming up and you need to start thinking "what am I doing for the Club?". ARRL is emphasizing volunteering for the Hobby this year. There's a reason. We need everybody's contributions to keeps Clubs active, which in turn keep the League active which in turns keeps our bands alive and well.

The new Mesh brings a lot of possibilities for the community in the valley. This Mesh has been growing around the Bay Area and now LARK will be integrated. A small investment in a dish/radio can bring you up to speed very quickly.

Well... another cold snap coming up and hopefully it will be warm and sunny again for new adventures in Ham Radio.

See you in the bands!

Roberto
K6KM

LARK Elections 2023

Nominations for LARK Officers/ Board Members 2023

President	George	KG6GEM
Vice President	Chris	W6CJQ
Secretary	Ryan	W6RAM
Treasure	Bernie	NJ6W
Activities	Jerry	N5KA
Board Members		
PP	Roger	KK6RD
	Nate	N8MOR
	David	KG6WIR
Chairpersons		
Repeaters	Ian	W6TCP
Newsletter	Roberto	K6KM
V/E	Ron	AD6KV
Membership	Venkatesh	KM6TAB
Events Coord	George	KG6GEM
Nets Coord	Ed	AE6D
Swap-n-Shop	Rich	KN6HSR
RFI	Gary	NA6O
T-Hunts	Rich H	KN6FW
APRS Tech Coord	Arnold	KQ6DI
Web Site	Arnold	KQ6DI

LARK Board Meeting Notes



LARK Board Meeting | February 16, 2023 | Minutes

Attendees: George, Chris, Ryan, Roger, David, Nate, Jerry, Var

Absent: Ian, Bernie

Call to Order

1. Meeting called to order by George at 7:05 PM.

Treasurer's Report - George

1. Nothing to report.

Repeaters - Nate

1. Open microphone during RTTTP, make sure external mics are plugged in. Yaesu radio with single plugs seem to not be secure when plugged in and need to be held in by some type of holding device or not used in an effort to prevent the 'open mic' issues.

Activities - Jerry

1. February meeting presentation by Lee KI6OY: Talk on solar cycle and sun spot activity
2. March meeting presentation by Arnold KQ6DI: Talk on Coax cable
3. April: No meeting due to Cinderella Bike Ride Event support
4. May meeting presentation by John: Winlink Communications
5. Looking for speakers for July, August, September
6. Spring or Early Summer Pt. Reyes Historical Museum Site tour: David W600 getting details

Events - George

1. March 5th Livermore Half Marathon - Need about 10 more people
2. April 15th Cinderella Bike Ride
3. April 29th Berkeley Hills Road Race (not a Lark event)
4. May 7th Devil Mountain Run

Membership - Var

1. 149 members including 8 life members
2. 44 people from last year have not renewed

Bylaws Revision - Roger

1. Will go forward with vote during February meeting

Election - George

1. Plan to vote by affirmation at the LARK Monthly meeting in March

Board Meeting Update - George

1. Plan to make Board meeting Mondays at 7:30pm beginning March 13th

Adjournment

1. George adjourned the meeting at 7:47 PM.

Minutes submitted by:

Ryan Mahoney (W6RAM) - LARK Secretary6

LARK Meeting Notes



LARK General Meeting | February 18, 2023 | Minutes

Call to Order

1. Meeting called to order by George KG6GEM at 9:45 AM.
2. George started introductions, first of In-Person attendees and then Zoom attendees.
3. 34 in person / 11 on Zoom / 0 guests (45 total)

Presentation

1. George introduced Lee Zalaznik KI6OY for his presentation on How to Propagate Signals Around the World using the Sun and Amateur Radio.

Treasurer Reports – Bernie NJ6W

1. Club finances have been good.
2. If you're new to the club you get a badge for free. An updated badge is \$10.

Activities – Jerry N5KA

1. March meeting presentation by Arnold KQ6DI: Talk on Coax cable
2. April: No meeting due to Cinderella Bike Ride Event support
3. May: meeting presentation by John: Winlink Communications
4. June: Gary N6AO How Do I Know I'm Getting Out
5. Looking for speakers for July, August, September

Events – George KG6GEM

1. March 5th - Livermore Half Marathon – Need 5 more volunteers
2. April 15th - Cinderella Bike Ride – Need a lot more volunteers
3. May 7th – Devil Mountain Run in Downtown Danville
4. All confirmed event signups are available on the LARK website.

Membership – Var KM6TAB

1. Membership for 2023 includes 149 paid members
2. Following up with 44 people that have not renewed for 2023

Old Business

1. Minutes from January meeting approved unanimously.

Repeaters – Ian W6TCP

1. Mesh node going in on Sunol Ridge

V/E Testing Ron AD6KV

1. No test today

ARES – Ron AD6KV

1. Continue to make slow progress

Bylaws Revisions – Roger KK6RD

1. Roger presented proposed changes to Bylaws
2. Roger KK6RD motioned we accept the changes, David KG6WIR Seconds

3. Motion passed unanimously

LARK Elections for 2023 – George KG6GEM

1. No new nominations and current officers have agreed to continue for 2023

2. If you are interested in volunteering for coffee or assisting with membership please contact George KG6GEM

Klutz Award Nominations

1. Clancy N6FQQ gave the reminder for the general meeting during the Monday night net and announced the location as 3575 Pacific Ave (Old meeting location) and then was corrected to the proper address of 1016 S Livermore Ave

Operating

1. Lee has made a lot of contacts. Tries to get on air every day. 50 contacts into Japan in 2 hours.

2. Gary N6AO propagation is good, get yourself on the air. Bouvet Island worked from W6SRR station. Made India on 80m. Worked the same guy on 10m a few weeks later.

3. Clancy N6FQQ has had good luck on 10 meters.

4. Ian W6TCP had bad luck in January storms with 85mph plus winds destroying some antennas.

Ask an Elmer –

Working on a project and have a question? We can find people that have a question.

Adjournment

1. George KG6GEM adjourned the meeting at 11:28 AM

Minutes submitted by:

Ryan Mahoney (W6RAM)– LARK Secretary

Livermore Half Marathon - Sunday, March 5th 2023

This 13.1 mile run goes from downtown Livermore to Sycamore Grove Park and back to downtown Livermore. Ham radio volunteers provide communications for needed supplies and emergencies as needed. The event should conclude around noon. The hours should be from 7am to about noon.

The event web page is:
<https://runsignup.com/Race/CA/Livermore/LivermoreValleyHalf>

Please review the available slots below and click on the button to sign up. Thank you!



Sign up at:

<https://www.signupgenius.com/go/10C0844AEAD28A6FA7-livermore>

A little bit of Ham Humor, courtesy of Tony KF6JS

I think my ham radio equipment may have fallen in love with me.
It hasn't said anything but I've been picking up a lot of signals.

My dad loves to boast about he can get Mexico on his ham radio set up.
That's nothing I'd say, I can open my window and get Chili.

Cinderella Bicycle Classic Saturday, April 15, 2023

The Cinderella Classic, Challenge and Short rides are 65/100/35-mile recreational bicycle ride (not a race) for women & girls only. Males do not ride the Cinderella; they do the organization, support, rest stops and SAGs for the Cinderella's. This event provides the opportunity for all hams of any experience to provide support from different assignments. The assignments are Stationary, SAGs, and Shuttles. Most assignments can be done with a HT. We encourage you to volunteer for this very worthwhile public service event. LARK has supported this event for many years.



Valley Spokesmen Bicycle Touring Club

Amateur Radio coordinator:

George Moorehead, KG6GEM kg6wiu1@comcast.net

Sign Up online here:

<https://www.signupgenius.com/go/10C0844AEAD28A6FA7-cinderella1>

A little bit of Ham Humor, courtesy of Tony KF6JS

Can Ham radio be an addiction?

Depends on the frequency!

There's this new cryptocurrency called Decibel.

You just yell into your Ham microphone to get money...

It's a sound investment.

Devil Mountain Run - Sunday, May 7th in Downtown Danville

This event takes place in downtown Danville and is a foot race. Each position will be stationary, except for a possible bicycle sweep. Net Control will be in San Ramon Valley Fire Protection District Communications Vehicle CS-131 in downtown Danville. Due to the



location of the positions you will be able to perform your function with a handheld radio. The week of the event you will receive all necessary information including assignments. This event is a great chance to get out and use your radio and all levels of experience is welcome. Our prime concern is to provide emergency communications along the race routes. Assignment times are from 0700 hrs until released.

Ham Coordinator: George Moorehead, KG6GEM, kg6wui1@comcast.net

Sign up at: <https://www.signupgenius.com/go/10c0844aead28a6fa7-devil1#/>

2023 Race to the Flagpole - John WB6ETY

Background:

On Saturday, 1/28/23, LARK supported the 12th Race to the Flagpole. LARK supported two events; a 5K, and a 10K. There was also a one mile "Fun Run" entirely within Independence Park that we did not support.

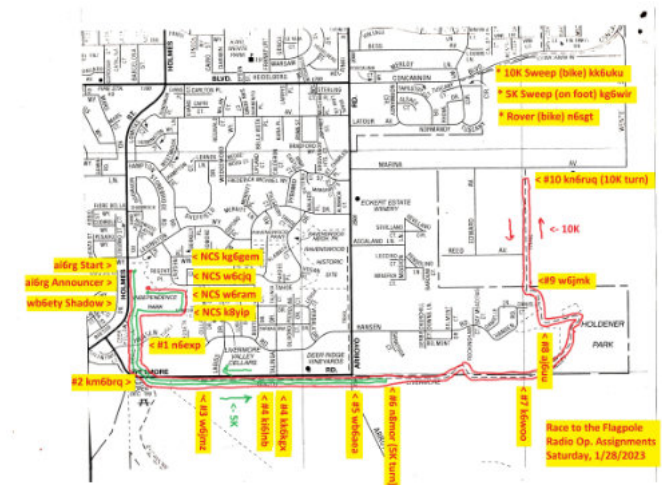
This year's format was changed at the "last minute" because of flood damage to Sycamore Grove Park. The races started and finished near the flagpole in Livermore's Independence Park as always. But instead of looping through Sycamore Grove Park on its paved and unpaved trails, the 5K and 10K race routes were "out and back" on the paved bike trail leading from Independence Park past Sycamore Grove Park, and then past Holdener Park. The 5K turned around just east of Arroyo Road while the 10K turned around just short of Marina Ave.

The RttFP is hosted by the Livermore Granada Boosters Club with proceeds supporting their scholarship fund. Scholarships are awarded to scholar athletes at Livermore High School and Granada High School. LARK has provided communications for this event since 2011, the event's second year.

This year: The Event:

The event was successful; there were no reported injuries. The day started out cold, it was 31F when I left my house, but warmed up nicely, unless you were in the shade!

There were 307 runners/walkers this year (74 in the 10K, 147 in the 5K, 86 in the one mile). That compares well to the 2022 total of 232 (71 in the 10K, 117 in the 5K, 44 in the one mile). The 10K started at 0855, the 5K started at



0900. All the 10K and 5K runners finished by 1047.

As reported in the Independent newspaper, Mike Nagle, the race director said: "We were so happy with the turnout and appreciate the tremendous community support. The weather was beautiful and it was an absolutely wonderful day."



Radio Information:

The Net Control Station (NCS) operators met in the cold at Independence Park at 0630 hours to activate the San Ramon Valley Fire Protection

District's CS-131 communications van as our Net Control Station on wheels. George, KG6GEM; Chris, W6CJQ; Ryan, W6RAM; and Steve, N8YIP were our NCS radio operators. John, WB6ETY, set a portable APRS digipeater (KQ6DI-3, supplied by Arnold, KQ6DI) across the parking lot from the CS-131. Its antenna was a 10 foot vertical collinear antenna on a 15 foot mast.



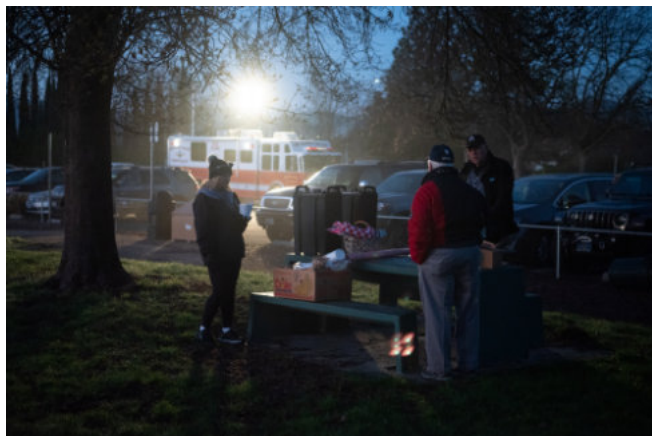
At 0715 hours we all gathered next to the CS-131. We had a brief meeting to check-in, discuss our plans and assignments, and perform radio checks to ensure we all were accessing our primary repeater, the W6SRR Sunol Ridge 2m repeater (backups were the AD6KV repeater, the WA6ODP repeater and our local simplex frequency). We had time to pick up a cup of coffee and bagel (provided by the Boosters!) before dispersing to our assignments. By 0800, everyone had headed to their assignment; some of us stayed in Independence Park, while others walked or drove to get to their assignments. Before the first race started, all operators had successfully checked in with the NCS from their assigned locations.

While all assignments were HT compatible, David, K6WOO; Bill, AJ6UU; and Greg, KN6RUQ, all set up better stations and antennas. That's always good practice and

would be helpful if we needed to use our backup simplex frequency if our primary and backup repeaters had failed!

Speaking of backup frequencies, during the event one of our stations apparently suffered a "stuck mic". Net control, having enough RF power to override the "stuck mic" station, directed all stations to switch to our backup repeaters. I'm happy to report that all of us made the switch and our net continued smoothly! Look for some upcoming LARK protocol changes to minimize "stuck mic" disruption.

It appears that the event organizer could have used a few more volunteers, as our operators at the 5K and 10K turnarounds were all alone. Nate, N8MOR; and Greg, KN6RUQ, stepped up and reminded distracted runners that they should be making a "U-turn"!



Our sweep and rover operators (Mark, KK6UKU, 10K Sweep Bike; David, KG6WIR, 5K Sweep (on foot); and Bill, N6SGT, 5K/10K Rover Bike) carried APRS trackers so our NCS operators could monitor their "real time" locations on video monitors in the CS-131. The NCS ran aprsis32 software with all position packets arriving via the internet. While many of our tracker packets were received directly at one of the LARK permanent iGates for injection into the

Link to event candid photos (radio operators appear in a few):

<https://livermoregranadaboosters.smugmug.com/Events/230128-RACE-TO-THE-FLAGPOLE-CANDIDS-CLARK/>

Link to an article in the Independent Newspaper:

https://www.independentnews.com/community/local-runners-perform-at-race-to-the-flagpole/article_dd99946c-a26e-11ed-a752-b71644ad1d3a.html

Link to 20 pictures in the Independent Newspaper (radio operators appear in a few):

https://www.independentnews.com/news/education_news/race-to-the-flagpole-starts-at-independence-park/collection_9e0abd18-a245-11ed-8297-b3f4d63a0c25.html



CS-131 SRVFPD Comm Vehicle at Independence Park



Peter AI6RG during National Anthem.



KQ6DI's portable digipeater at Independence Park ----->



KQ6DI's portable digipeater & antenna at Independence Park



Crossing guards at Wetmore Rd at Sycamore Grove Park



Final 10K finishers with Sweep and Rover bikes following



WB6ETY's trunk full of gear for the Race to the Flagpole



Stn 5; Peaceful setting before the race



Stn 7; Fish-eye view of trail near Holdener Park before the race



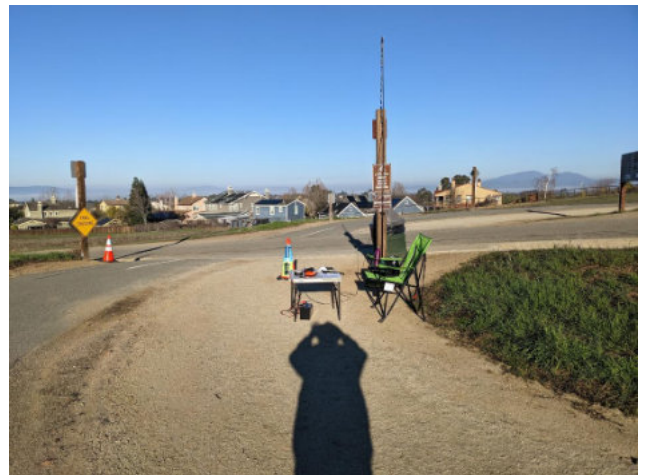
Stn8; Runners near Holdener Park



Stn8; Runners near Holdener Park



Stn8; Trail crossing at Holdener Park driveway



Stn8; Trail crossing at Holdener Park driveway



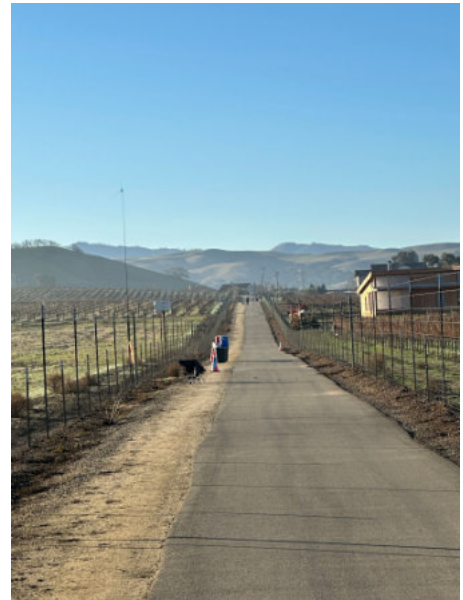
Stn8; Bill AJ6UU



Stn8; Trail crossing at Holdener Park driveway



Independence Park: Pre-event meeting



Stn10; View of trail from 10k turnaround



Stn10; Water Station

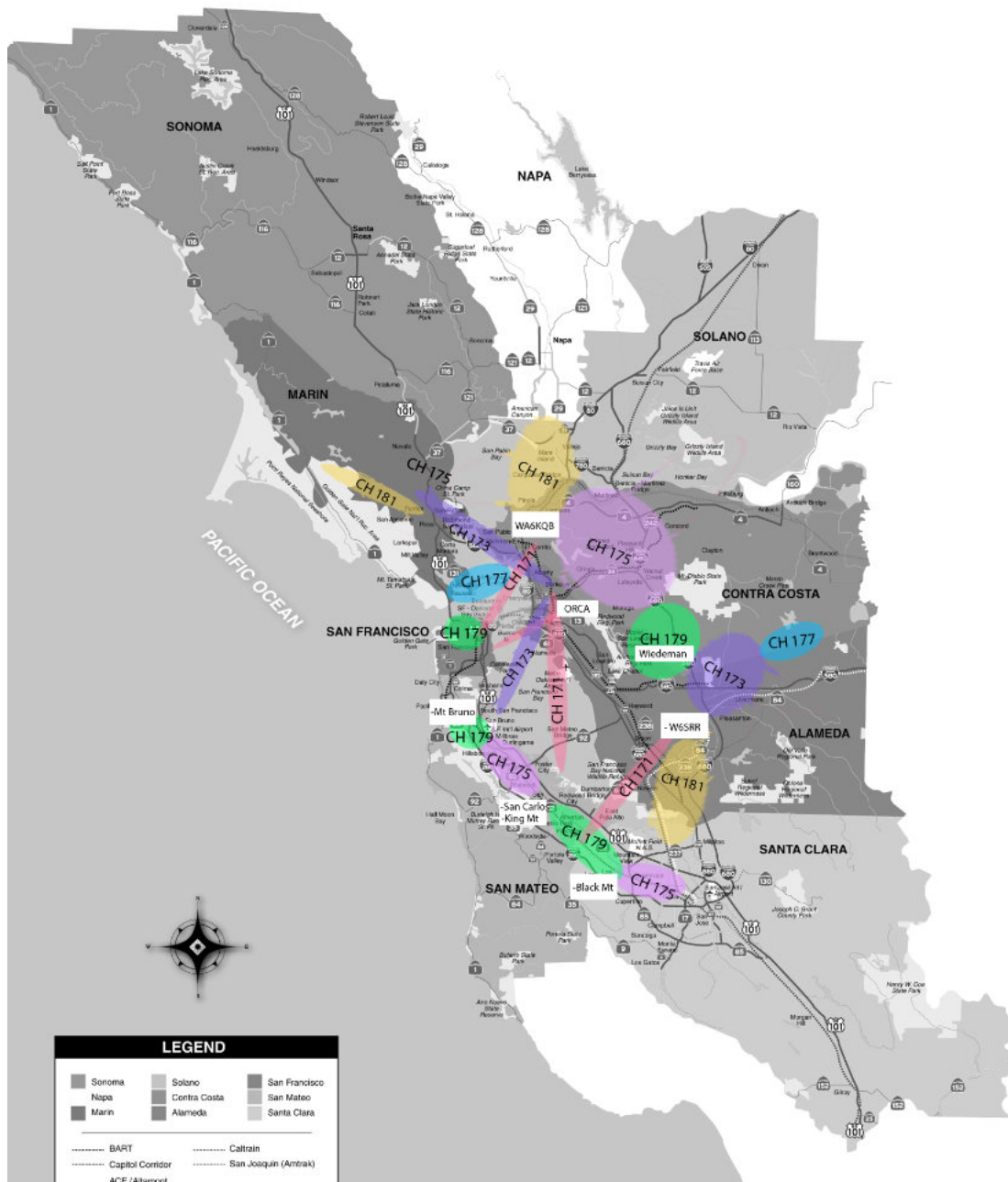


Stn10; Field station

AREDN nodes now at Sunol Peak W6SRR - Ian W6TCP

The Bay Area Mesh network has arrived at Sunol Peak with sectors pointing towards Livermore and Fremont. The Bay Area Mesh has gradually expanded from its roots in San Francisco to hundreds of radios around the Bay Area; and finally we've been able to cross the ridge with radios at Sunol Peak lighting up Pleasanton and Livermore.

If you have a clear view of Sunol Peak then we hope you'll pick up a cheap 5GHz radio, flash it with the AREDN software, and connect to the mesh by seeking out the node W6SRR-SR-LIVERMORE on channel 173.



Attached is the updated band plan / Map. There is also updated the graphics to aid in the location of sites & channel usage for the South Bay and Tri Valley areas. I'm extremely interested in signal reports regarding North Sector: Tri-Valley (CH 173 20mhz) and South Sector: Fremont (CH

181 10mhz).

Helpful links:

Bay Area Mesh Map - <https://sfmap.xojs.org/>

Bay Area Mesh Wiki - <https://bamwiki.xojs.org>

Sunol site details - https://bamwiki.xojs.org/index.php/Sunol_Ridge

AREDN radio suggestions - <https://bamwiki.xojs.org/index.php/Radios>

AREDN - <https://arednmesh.org>

Please reach out to one of the technical contacts with help questions or about getting started with equipment, or advanced questions!

Tim, tim@sfwem.net KN6PLV

Mathison, mathisono@gmail.com KJ6DZB



Ian W6TCP

w6tcpian@gmail.com

960 MHz	Channel	4	5	6	7
	Ctrl Freq	907	912	917	922
	Status	Shared with US unlicensed			

You are responsible for using frequencies, channels, bandwidths, and power levels that comply with your country's amateur radio license requirements.

2.4 GHz	Channel	-4	-3	-2	-1	0	1	2	3	4	5	6	7	8*
	Ctrl Freq	2.387	2.392	2.397	2.402	2.407	2.412	2.417	2.422	2.427	2.432	2.437	2.442	2.447
	Status	non-US only		Unshared		Cannot use	Shared with US unlicensed							

* Only 5 MHz channel width is available on channel 8

3.4 GHz	Channel	76	77	78	79	80	81	82	83	84	85	86	87	88	89
	Ctrl Freq	3.380	3.385	3.390	3.395	3.400	3.405	3.410	3.415	3.420	3.425	3.430	3.435	3.440	3.445
	Status	Shared with US non-Amateur users													

5.8 GHz	Channel	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148
	Ctrl Freq	5.665	5.660	5.665	5.670	5.675	5.680	5.685	5.690	5.695	5.700	5.705	5.710	5.715	5.720	5.725	5.730	5.735	5.740
	Status	Shared with US unlicensed indoor/outdoor DFS & Radar Avoidance (max EIRP 1000mW)																	

DFS Channels U-NII-2c (Extended)

5.8 GHz	Channel	149	150	151	152	153	154	155	156	157	158	159	160	161	162	163	164	165	166
	Ctrl Freq	5.745	5.750	5.755	5.760	5.765	5.770	5.775	5.780	5.785	5.790	5.795	5.800	5.805	5.810	5.815	5.820	5.825	5.830
	Status	Shared with US unlicensed indoor/outdoor (max EIRP 200W)																	

U-NII-3 DFS Channels

5.8 GHz	Channel	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184
	Ctrl Freq	5.835	5.840	5.845	5.850	5.855	5.860	5.865	5.870	5.875	5.880	5.885	5.890	5.895	5.900	5.905	5.910	5.915	5.920
	Status	Shared with US unlicensed																	

UNII-4 Proposed

Power limits shown are for non-Amateur services which share the specified channels.

How to Use the Sun and Propagation in Amateur Radio: Lee KI6OY

February LARK Monthly Presentation

How to use the Sun and Propagation in Amateur Radio Presented by Lee Zalaznik KI6OY

- **Warning:** Looking at the Sun directly can cause serious eye damage. It is possible to become blind.
- The Sun is our closest star.
- The Sun converts hydrogen to helium using fusion reaction.
- The Sun produces: A broad radiation spectrum, solar storms, solar flares, & coronal mass ejections.
- [STEREO](#)
-

Solar Indices

- SFI is the solar flux index. Measures the Sun's radio noise.
- SN is the sun spot number. The group of spots & number of spots in a group.
- A index is the 24 hour magnetic flux index. Measured by the magnetometers around the world.
- Kp index is the 3 hour magnetic flux index.
- [QRZ.COM](#)

The Ionosphere

- The Ionosphere is made up of layers of electrically charged particles. D, E, F1, F2
- [ARRL Tech Note](#)

Long and Short Term Propagation

- We are currently in Cycle 25 which will peak around 2025.
- It is great time to get on the higher bands such as 10, 12 and 15 meters.
- For the short term:
- Propagation is seasonal Winter is better than Summer
- Propagation follows the Sun east to west.
- Higher bands during the day and lower band in evening and at night.

The Reason for this is the D layer

- [D layer](#)
- Also we will look for a CME, EUV, solar storms & others things on the NOAA web site

Final Coment

- The best way to check propagation is get on the air and call CQ.
- For more information:
- [SpaceWeatherLive.com](#) or [SpaceWeather Live app](#)
- [Space Weather Woman](#) aka Dr. Tamitha Skov
- Questions?
- Comments?

Some useful links:

<https://stereo-ssc.nascom.nasa.gov/browse/2022/09/26/>

<https://www.swpc.noaa.gov/communities/radio-communications>

<https://www.qrz.com>

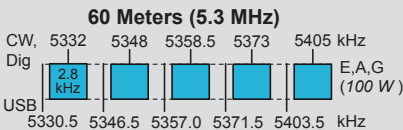
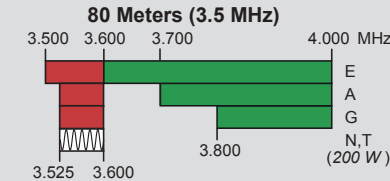
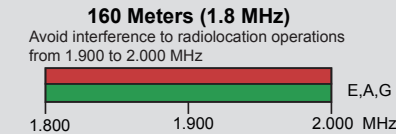
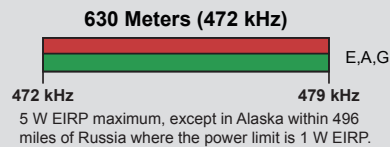
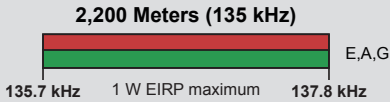
<https://www.arrl.org/files/file/Technology/pdf/119962.pdf>

US Amateur Radio Bands

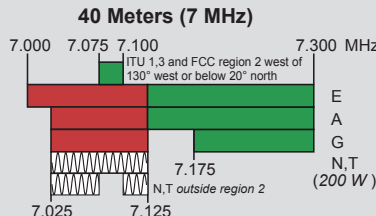
US AMATEUR POWER LIMITS

FCC 97.313 An amateur station must use the minimum transmitter power necessary to carry out the desired communications.
 (b) No station may transmit with a transmitter power exceeding 1.5 kW PEP.

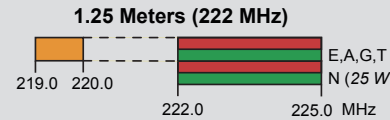
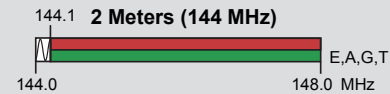
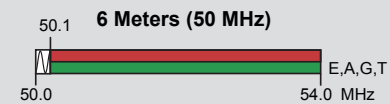
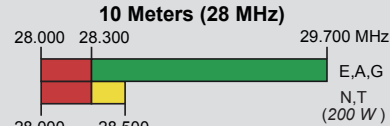
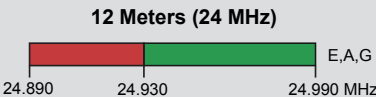
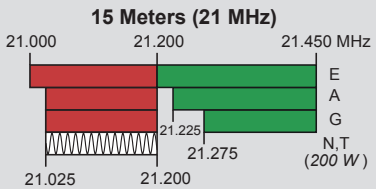
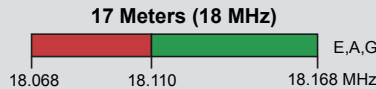
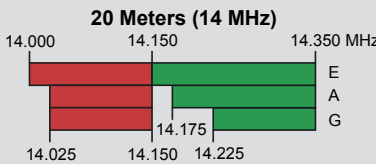
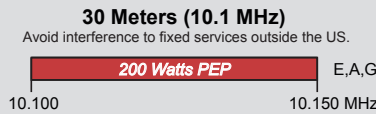
Amateurs wishing to operate on either 2,200 or 630 meters must first register with the Utilities Technology Council online at <https://utc.org/plc-database-amateur-notification-process/>. You need only register once for each band.



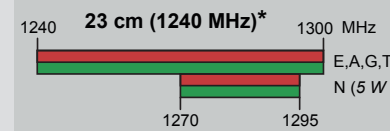
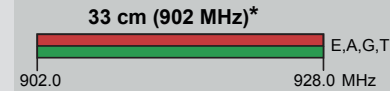
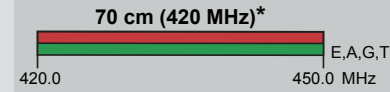
General, Advanced, and Amateur Extra licensees may operate on these five channels on a secondary basis with a maximum effective radiated power (ERP) of 100 W PEP relative to a half-wave dipole. Permitted operating modes include upper sideband voice (USB), CW, RTTY, PSK31 and other digital modes such as PACTOR III. Only one signal at a time is permitted on any channel.



See Sections 97.305(c), 97.307(f)(11) and 97.301(e). These exemptions do not apply to stations in the continental US.



*Geographical and power restrictions may apply to all bands above 420 MHz. See *The ARRL Operating Manual* for information about your area.



All licensees except Novices are authorized all modes on the following frequencies:

2300-2310 MHz	10.0-10.5 GHz ‡	122.25-123.0 GHz
2390-2450 MHz	24.0-24.25 GHz	134-141 GHz
3300-3500 MHz	47.0-47.2 GHz	241-250 GHz
5650-5925 MHz	76.0-81.0 GHz	All above 275 GHz

‡ No pulse emissions

KEY
 Note: CW operation is permitted throughout all amateur bands.
 MCW is authorized above 50.1 MHz, except for 144.0-144.1 and 219-220 MHz.
 Test transmissions are authorized above 51 MHz, except for 219-220 MHz

- = RTTY and data
- = phone and image
- = CW only
- = SSB phone
- = USB phone, CW, RTTY, and data
- = Fixed digital message forwarding systems only

- E = Amateur Extra
- A = Advanced
- G = General
- T = Technician
- N = Novice

See *ARRLWeb* at www.arrl.org for detailed band plans.

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Getting Started in Amateur Radio:
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 email: newham@arrl.org

Exams: 860-594-0300 email: vec@arrl.org

HANDIMAN'S GUIDE TO SOLAR ACTIVITY & HF PROPAGATION FOR THE QRPer

by Paul Harden, NA5N (na5n@zianet.com)
Very Large Array (VLA) Radio Telescope
Socorro, New Mexico USA

USEFUL LINKS:

www.swpc.noaa.gov

Official Space Environment Center current "Space Weather" from NOAA. Also check:

www.spaceweather.com

www.solen.info/solar

Graphical display of solar flux, sunspots and A-index by Jan Alvestad, SOHO images, and other very useful information.

<http://space.umd.edu/pm/>

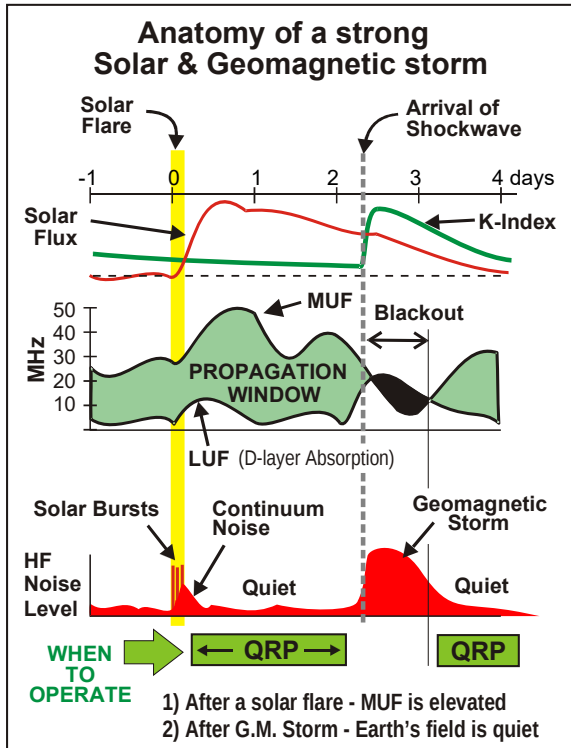
Solar wind data (speed and density) from proton monitor on SOHO satellite.

<https://prop.kc2g.com/>

Near real-time MUF (max. usable freq.) map

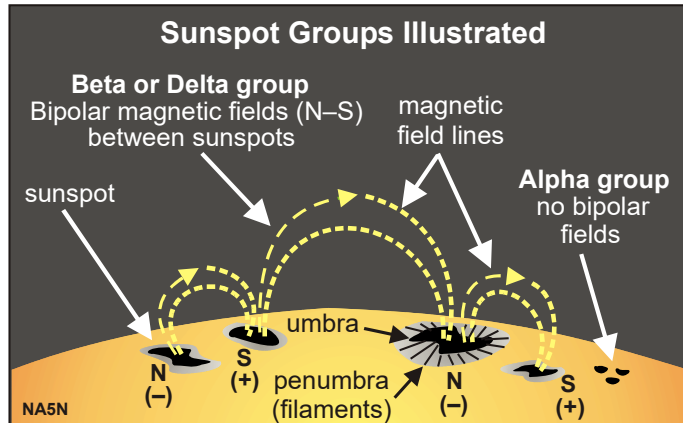
<https://www.spaceweather.gc.ca/forecast-prevision/solar-solaire/solarflux/sx-4a-en.php>

Current solar flux from the "horses mouth" - Pentictin



Classifications of Sunspots/Active Regions

Sunspot Class	Description of the Active Region	Potential for Solar Flare Activity
ALPHA	Unorganized, unipolar magnetic fields	Little threat, but watched for further growth
BETA	Bipolar magnetic fields between sunspots	C class flares and possible M class flares
DELTA	Strong, compact bipolar fields between sunspots	High potential for large M or X class flares



Geomagnetic Indices & Conditions

	K Index	Ap Index	Geomagnetic Conditions	HF Noise	Aurora
NORMAL	0	0-2	Very Quiet	S1-S2	None
	1	3-5	Quiet	S1-S2	None
	2	6-9	Quiet	S1-S2	Very low
	3	12-19	Unsettled	S2-S3	Very low
STORM	4	22-32	Active	S2-S3	Low
	5	39-56	MINOR storm	S4-S6	High
	6	67-94	MAJOR storm	S6-S9	Very high
	7	111-154	SEVERE storm	S9+	Very high
	8	179-236	SEVERE STORM	Blackout	Extreme
	9	300-400	EXTREME storm	Blackout	Extreme

Equivalent Planetary A-Index (Ap)
Geomagnetic conditions *yesterday*

For *current* 3-hour conditions, use K-index

Solar Flare Classifications

Flare Class	Type of Flare	HF Radio Effects (30M to 10M)	Geomagnetic storm (<20M)
A	Very small	None	None
B	Small	None	None
C	Moderate	Low absorption	† Active to Minor
M	Large	High absorption	† Minor to Major
X	Extreme	Possible blackout	† Major to Severe

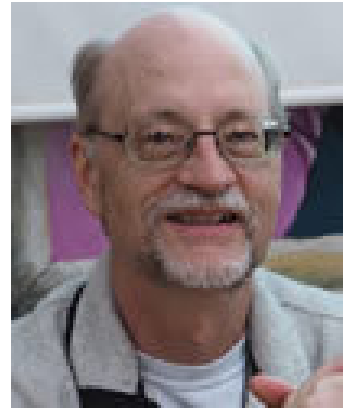
† Conditions cited only if Earth is in the trajectory of the flare's shockwave.

Updated by KI6OY

An Epic Pileup... With all the Trimmings - Gary NA6O

The recent DXpedition to Bouvet Island, 3Y0J, was long-awaited after two recent failed attempts to reach this most-desired and incredibly remote and dangerous DX entity. The well-trained and prepared team and crew sailed from the Falkland Islands on a 100-foot ketch and safely reached the island. But they then encountered the not-unexpected high winds (40-60 kt) high seas up to 4 m, and constant freezing temperatures that made landing via Zodiac nearly impossible. In fact, everything had to be floated to shore along a fixed tow line, along with the people who wore survival suits. They did manage to get a subset of the team on the island along with one tent,

a generator, a couple of K3 transceivers, a couple of vertical antennas, and enough supplies to last until the next "rescue" trip could swap out team members or bring more supplies. See the links at the end of this article to read the full story.



The original plan had been to deploy 13 operators, four tents, 12 antennas, and 8



radios with the hope of making 200,000 QSOs over a period of up to three weeks. But as Mike Tyson said, everyone has a plan until they get punched in the mouth. So after encountering the reality of conditions at Bouvet, a handful of men operated, ate, and slept together in one unheated tent with no chairs or tables from Feb 6-14. When you read about it, the fact that they did it at all is amazing. In the end, 18,842 QSOs were made over the 8 days of operation. The operation cost a staggering \$715, 000 and took over three years of planning.

The worldwide pileups were epic as expected with nearly every DX chaser seeking a contact, many for an all-time new one (ATNO). With 3Y0J running only 100

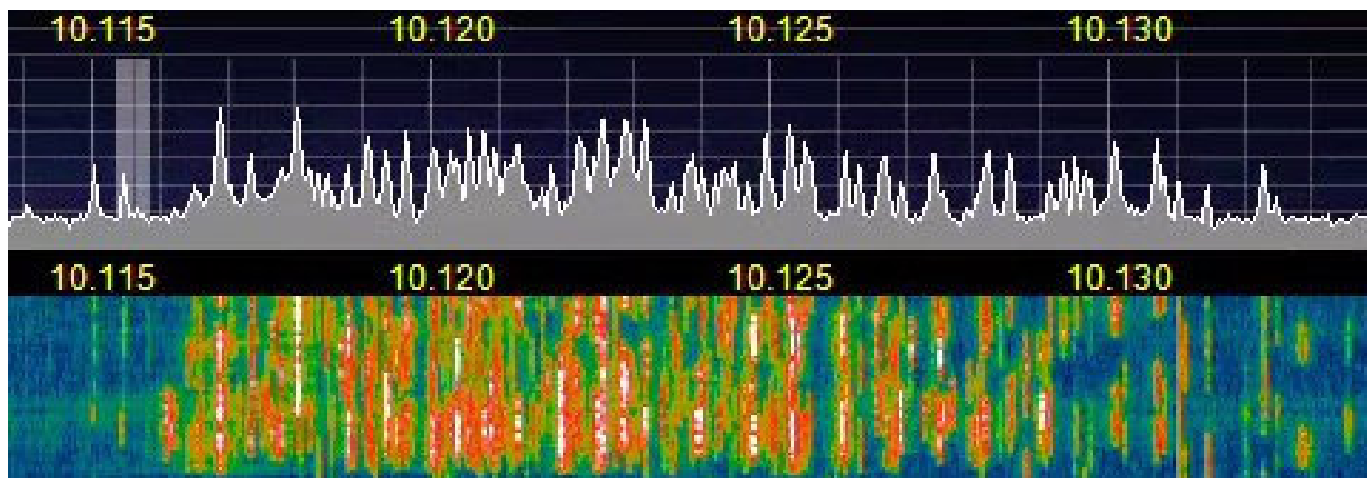
Watts and being near the antipode from our location in California, making any contact would be challenging and in the end very few small stations were able to work them. Lucky for me and Ian, W6TCP, we built a superstation up on Sunol Ridge. I found them on 30 m CW at 0340Z on the first day they were on the air.

Below is a screenshot of the waterfall display showing the pileup. For those of you who have never experienced such an event, it consists of thousands or tens of thousands of hams all over the world calling simultaneously, spread out over some portion of the band. In this case, 3Y0J is calling CQ at 10.115, and everything above that is people screaming for attention. (They also operated SSB



where the pileups were simply hopeless, and FT8, where there was quite a bit of

pileup without ever even hearing the DX, hoping for a miracle contact.



confusion due to timing problems as well as pirate stations.) Our radio is a K3 with a second receiver, so I listen to the DX in one ear while tuning through the pileup with the other ear, while also looking at the waterfall display to figure out where the DX might actually be listening. That's where I put my transmitter. It didn't take too long to find the magic frequency near the middle of the pileup, and I got them after a few calls. Victory! I then handed the station off to Roberto, K6KM, and then to Ian, and we all shared the joy. Those were our only contacts and we waited anxiously until the logs were uploaded a week later to Clublog.org for confirmation.

The problem with big pileups and having many people desperately trying to work one station is that operating errors and intentional interference quickly appear. These days, it is further amplified by social media and comments on the spotting cluster (go to dxsummit.fi and search for 3Y0J; wear your flameproof suit). The bigger the pileup, the more mayhem. SSB is far worse than CW. FT8 is rather new, and doesn't seem to be abused quite as much, but I'm sure that the misbehaviors will be perfected as time goes on. The categories of unruly behavior are:

Lids: Incompetent operators who call on top of the DX, or just keep calling in the

Cops: Operators who keep sending UP UP IDIOT LISTEN UP UP on top of the DX, telling the Lids not to call on top of the DX. Brilliant...

DQRMers: Deliberate QRM generators. The most despicable of all, these are hams who intentionally interfere with the DX by transmitting on top of them, sometimes with signals much more rude than just carriers.

This stuff has always been around and there really is no easy solution. The social media aspect seems to bring out the worst in some people and is a good reason to simply avoid it altogether. But chasing DX is still fun, especially if you have the right attitude and learn how to be a conscientious operator. For me, busting the 3Y0J pileup was really rewarding. As for the good and bad aspects of this particular DXpedition, those will be debated for years to come.

For More Information

DXpedition website: <https://www.3y0j.no/>
3Y0J Facebook page: <https://www.facebook.com/groups/3093983840726129/>
Complete statistics: <https://clublog.org/charts/?c=3Y0J#r>

Amateur Radio Contact via Satellite - Sean KK6SM

by Sean Medina KK6SM in San Ramon, CA, USA, with Elisabeth Barry KJ7MEB in Salt Lake City, UT, USA

There are many words in this article's title; what do they mean?

My family and I talked to fellow work colleague Elisabeth Barry, reaching from the SF Bay Area, California to Salt Lake City, Utah.

What's special about that? I used a small radio and a special antenna, and she did the same. I 'relayed' a radio signal off of a satellite in orbit, to talk to Elisabeth, two states away!



That's still a lot to parse. Let's decompose it...

First: Amateur Radio (Ham Radio) - My definition is: "a hobby where you use equipment at your end and equipment at your friend's end, to get a message between you two.

You rely upon the physics of the world around you, to get your radio signal to the other end. You rely upon varying amounts of infrastructure: usually *none* - zero human-made infrastructure in between; but sometimes minor, volunteer-built infrastructure."

(In this case we relied upon quite-sophisticated infrastructure: a simple 'repeater' radio but mounted on a satellite in orbit!)

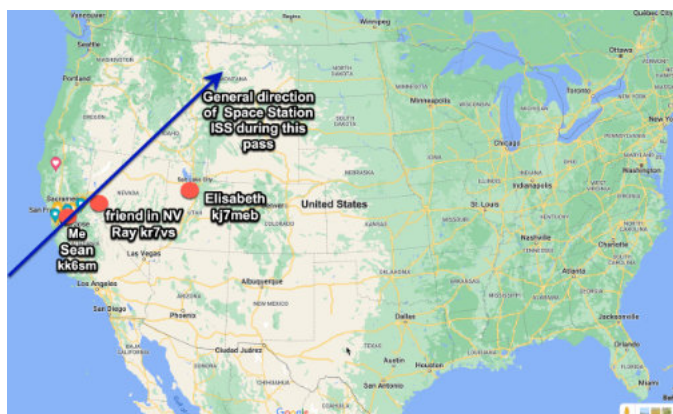


EQUIPMENT: NOT COMPLEX:

Above is the equipment here on earth: a \$200 radio, plus a special antenna built by fellow work colleague Roger Deming, kk6rd. Next you see my son and I using them.

At right is the equipment at Elisabeth kj7meb's end: a \$100 radio plus a special antenna she built. (My son and I are building an antenna like hers too.) YES, that antenna is made from pieces of a tape measure, plus plastic pipe.

(Not shown: she also used second \$30 radio and simple store-bought whip antenna, for reasons out of scope of this album.)



DISTANCE:

If Elisabeth and I would be ... 50 miles apart (80 km), we might be able to talk to each other using only these, with NO OTHER infrastructure. (... Can you see the allure of this hobby to me?)

But instead we are 580 mi (830 km) apart.

We relied upon a "radio repeater", a unit that receives a radio signal, amplifies and re-transmits it so others can hear it.

This repeater is mounted up high... VERY VERY high. It is in space. It is

mounted on the International Space Station.

PUTTING IT ALL TOGETHER:

In the left photo on the map I'm talking on the radio and my son is pointing the antenna at the satellite (the ISS) as it passes overhead. We could not see the satellite, as the daytime sky obscured it, however we knew its location.



We planned / choreographed it: over a 10-minute span we knew the satellite would rise above the horizon behind us, pass directly overhead, then set at the horizon in front of us. My son aimed the antenna at where we knew the satellite would be during this time. My wife was timekeeper, helping us know where to point the antenna.

GEEKY DETAILS:

The repeater on the ISS uses V/U mode (VHF uplink, UHF downlink).

I transmitted with 10W (or perhaps 50W) power.

Elisabeth transmitted with 5W power via her tape-measure VHF Yagi antenna.

The pass was 11 minutes long and went directly overhead.

Weather was clear at my end, cold and thick snowy clouds at Elisabeth's end.

Phone apps: "W1ANT Satellite Tracker", "AMSAT Droid", "Compass".

Web software "World Time Buddy", "amsat.org/track", "satmatch.com / satellite/ISS/ obs1/CM97AS/obs2/DN40br (using our two gridsquare coordinates)"



-

MY RADIO: a mobile B-Tech UV-50x2 at either 10W or 50W (likely 10).

I programmed the frequencies into a channel, to allow quick work with the repeater aboard ISS. I used the mnemonic "ISSR" with R meaning Repeater.

Tx: 145.9900 MHz simplex, PL 67 Hz, Rx: 437.8000 MHz

I actually made three channels:

ISSR Hi: 145.9925 / 437.8025 stated freqs, adjusted upward 2.5 kHz to account for Doppler shift as the satellite approaches me

ISSR: 145.9900 / 437.8000 the stated freqs

ISSR Lo: 145.9875 / 437.7975 adjusted downward 2.5 kHz to account for Doppler shift as it recedes

I also programmed the "astronaut voice frequencies for the outside chance that an astronaut might be transmitting, which is a rare event; I named this set "ISSA", with A representing astronaut. Likewise I programmed another pair of channels, Dopplered-high and low.

MY ANTENNA: Roger D KK6RD built this during a LARK build-it-yourself event. (LARK = Livermore Area Radio Klub)

Roger - it worked nicely and was lightweight!

THE PASS: The satellite was predicted to rise above the horizon at 13:56:34 my time, cross overhead (86 degrees max elevation), and set below the opposite horizon at 14:07:36. (21:56:34Z to 22:07:36Z (UTC))

The actual timeline, with estimates as

I reconstruct it: (times are Pacific Time, Jan 38, 2023):

Time (PT)	Time into pass	
13:56:34	0	predicted rise above horizon (southwest)
13:58:00	2m 0s	approx rise above nearby houses? (estimated)
13:58:00	2m 0s	heard two other hams talking (estimated)
14:02:10	5m 36s	max elevation (overhead)
14:07:00	10m 26s	Elisabeth kj7meb heard me (estimated)
14:07:16	10m 42s	Elisabeth kj7meb texted me, "I heard you".
14:07:36	11m 02s	predicted set below opposite horizon (northeast)

predicted pass duration: 11 min 2 sec

pass was traveling toward NE, toward Elisabeth's location. It makes sense that she heard me late in the pass as the satellite was descending toward my horizon, rather than early.

THE SATELLITE: International Space Station (ISS).

The crossband ham repeater onboard the ISS: Kenwood TM-D710E



Winter Field Day

A contest is running right now: ARRL's Winter Field Day contest! (ARRL = American Radio Relay League)

Unfortunately, since my contact to Elisabeth was only 1-way (I received her acknowledged by text, but could not hear it via radio), this does not qualify for entry into Field Day. Still, I'll record info below as a "dry run"



for some future contest.

Gridsquare locations: me (CM97as), Elisabeth (DN40br), Ray (DM09ce).

I contacted Elisabeth at 2023-01-28 1407 local / 2023-01-28 2207 UTC. "Phone" mode. Freq: "144"

One last word:

I have made simplex contacts - relying on nothing but my radio, the other person's radio, and the world around us. Zero infrastructure at all.

Now I've made a contact (well not quite, not a 2-way contact) - using the most-expensive repeater I know of: a standard Kenwood, but mounted in a \$35 billion satellite!

So I've made radio contacts using no-, and super-complex-infrastructure!!

Sean KK6SM

ARRL DX CW Contest 2023 - Roberto K6KM

As I usually say, DX and CW, what a combination! Recipe for fun.

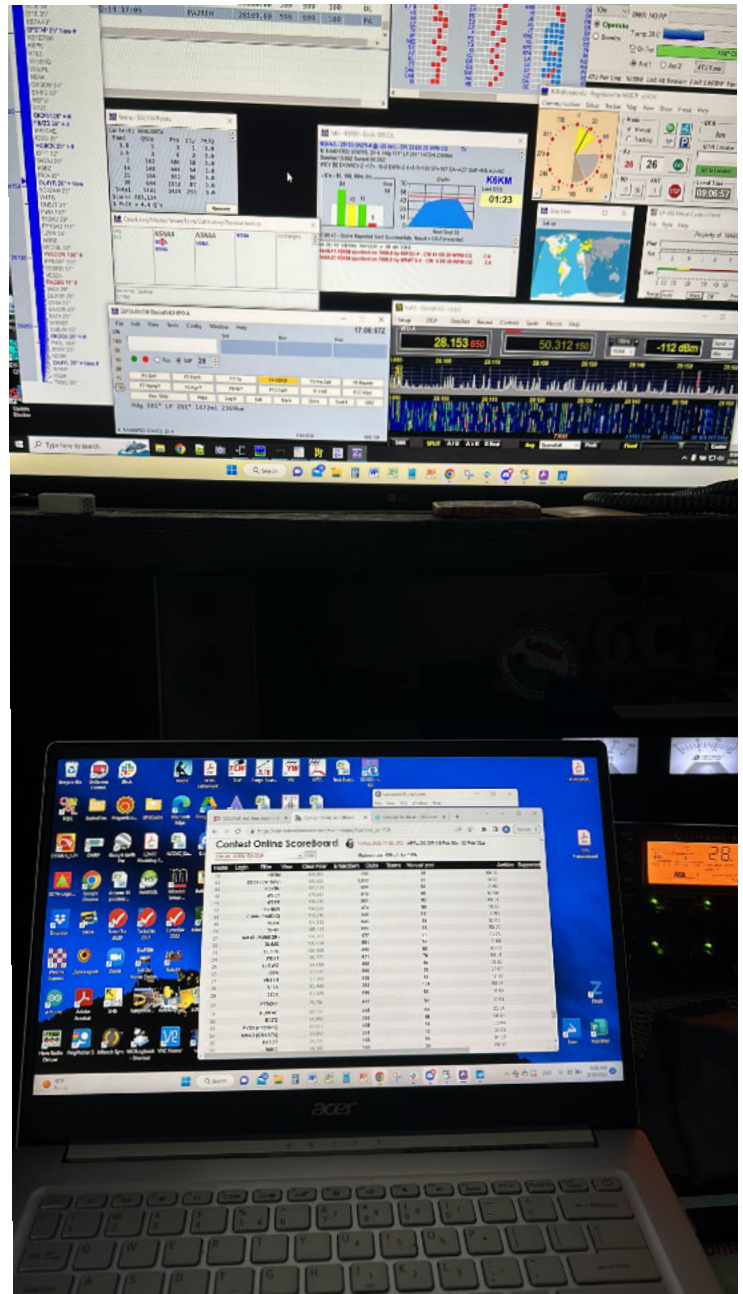
The day before the contest, a Coronal Mass Ejection happen in the Sun (in fact a series of them). Of course, it usually happens right for a weekend contest. The Flux had gone to an unbelievable 346. What was expected it would be followed by black-outs, geomagnetic storms and who knows, some enhancement of upper bands. I decided I would try for a 10m only operation. I'm also competing at the NCDXC Club for DX CW contacts. So I was very motivated to rack up as many as possible. So I would go around bands and have fun while 10m was shutting off.

The contest started with a bang and missed the first 20 minutes because I had to pick up my son at school. Digging a hole in 10m when the band is more than 150KHz full (see picture) it's a major task. I ran JA's and searched and pounced all sorts of multipliers.

After the band closed, I worked 15m, 20m, 40m and a sprinkle of 80m and 160m. 15m and 20m remained opened very long due to the enhancement ionization of the ionosphere.

Saturday morning the bands were full of Europeans. Again, finding or digging a hole in the band is a major chore. Europeans are different behaved than JA's. They usually run either, very high power (ahem...) or very low power. This complicates things during a pile-up.

I was using the N1MM+ logger as seen in



the picture. I hear people complain about it but I'm very happy with it. The laptop shows [Contestonline.com](https://www.contestonline.com). This is a website that shows real time the contester's results. Not everybody

participates so it's a restricted list but gives you an idea of where everybody else is in almost real time. Let me tell you, it's a big motivator to stick your butt on the chair and beat your closest opponent.

Back to the contest, last year I operated also from W6SRR (Gary's NA6O and Ian's W6TCP station). I made about 600 QSOs. So my goal this year was to make at least 1000QSOs.

Working primarily on 10m restricted me to get juicy multipliers on other bands. I would get some of those after 10m died down.

Lot's of stories to tell regarding pile-ups, stations that didn't behave, interferers, super weak stations. Many

Band	QSOs	Pts	Cty	Pt/Q
1.8	1	3	1	3.0
3.5	2	6	2	3.0
7	162	486	58	3.0
14	190	570	69	3.0
21	268	804	73	3.0
28	777	2331	97	3.0
Total	1400	4200	300	3.0

Score: 1,260,000
1 Mult = 4.7 Q's

JA stations can only operate 5W but some come at 1W or even less. Why do I know their power? The exchange for the contest is: signal report and power.

Sunday morning the opening to EU was epic. 10m was back-to-back of stations calling. Some signals were really great and it was easy to work quickly.

In fact, many times I was having more and quick success scanning the band than calling CQ under very crowded conditions.

JA of course was not the same on Sunday. It's their Monday and many people go back to work.

One thing that stroke me is how weak and missing were South American stations. I tried several times to call CQ south at no avail. I did get some of the usual suspect big stations. Sunday afternoon, when QRM conditions were less prominent, they started showing up to the point I was working them from the back of the beam pointing to JA.

After 27 hours of operation (most of them fun) I ended up beating my goal by a bunch. 1400 QSOs in total. 10m was 777 (lucky number).

I'm proud to say, that according to 3830 (early results report) I ended up first in my category (SOU AB HP) for the NCCC Club.

It would not be possible without the fine W6SRR station.

Looking at the 10m results, they were very good but probably not good enough to compete with other bigger stations. I did not manage to get DXCC on 10m alone. I was just 97. I did, however, get DXCC overall 107. Usually I get more but the fact that I was mostly focusing on 10m left a lot of multipliers missing for me.

Overall, this is one of the top contests for me as fun metric is concerned.

And not only myself had fun. I know our

LARK Member Dave: K3GX was having fun with 100W at home and later driving to the top of Del Valle Rd. with his QRP rig and being amazed at how many DX contacts he could make with 5W and a wire (and a good location).

In fact, Monday we went together to Brushy Peak here in Livermore to activate SOTA and we both got DX. I got DL on 10m and he got OH on 15m. 5W and a wire.

If you don't know CW and refuse to learn it, there's an SSB version of this contest. Of course won't be as easy as CW in terms of propagation but might be your best time to try. Propagation has not been this good in many, many years from what I hear

from seasoned Hams.

Why do we contest? Just check the bands any day, a few stations in the air. If you are a Ham who likes to operate, contesting time is when the bands are full. You can grow your skills at operating very fast. Contesters push the technical capabilities of their stations to the limit. The goal is to win.

Somebody told me afterwards, I'm just a casual contester. I think I'm one too. I was in my pajamas most of Sunday.

Roberto

K6KM



From the LARK CAVE



Clancey N6FQQ, at the breakfast before the February general meeting. Double butter and double syrup, definitely above the FCC high power limit.

Mark Bowers climbing the antenna we were contacted to help take down. Mark was the only one brave (?) enough to climb and evaluate, and we ultimately decided it was beyond our abilities to safely take down. The owner thanked us for trying.

This month's Swap 'N Shop special, which was just acquired from Clancey at the February meeting. It is an ICOM IC-27H, VHF radio, fully capable, and 45W high power output! Manual available online. Will go fast at \$25 for a club member. Contact Rich KN6HSR at KN6HSR@ARRL.net.

Contact Rich: KN6HSR@arrl.net



March 2023

<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>	<u>Saturday</u>	<u>Sunday</u>
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18 LARK Meeting	19
20	21	22 Ham Breakfast	23	24	25	26
27	28	29	30	31		

LARK MON. NIGHT NET ON: 147.120 MHZ + offset,
PL 100 AD6KV.
Every Monday 7 PM local time.
Visitors welcome to join in.

Net Control Operator Schedules

Monday Night Net Control Operator Schedule

January

February

March

DAY	OP	NAME
02	AD6KV	Ron
09	EOC	
16	AE6D	Ed
23	WB6ETY	John
30	WB6AEA	Jon

DAY	OP	NAME
6	AD6KV	Ron
13	EOC	
20	AE6D	Ed
27	WB6ETY	John

DAY	OP	NAME
6	WB6AEA	Jon
13	EOC	
20	AD6KV	Ron
27	AE6D	Ed

EVERYONE is invited to check in to the net. Please contact AE6D ae6d@sbcglobal.net if you need more information or would like to become a Net Control Operator. After the net please call Ed AE6D with the AC/DC statistics or send him the information by email.

Thursday Night Net Control Operator Schedule

Date	Weekday	Primary Net Control	Backup Net Control	Topic
1/5/2023	Thursday	Nate/N8MOR	Bill/AJ6UU	New Comer, General Discussion:
1/12/2023	Thursday	Rich/KN6HSR	Nate/N8MOR	Easy Tech Discussion:
1/19/2023	Thursday	David/K6WOO	Rich/KN6HSR	General Discussion:
1/26/2023	Thursday	Bill/AJ6UU	David/K6WOO	Advanced Tech Discussion
2/2/2023	Thursday	Noah/AJ6XK	Bill/AJ6UU	New Comer, General Discussion:
2/9/2023	Thursday	Peter/AI6RG	Noah/AJ6XK	Easy Tech Discussion:
2/16/2023	Thursday	Brian/KA6ZED	Peter/AI6RG	General Discussion:
2/23/2023	Thursday	Nate/N8MOR	Brian/KA6ZED	Advanced Tech Discussion
3/2/2023	Thursday	Rich/KN6HSR	Nate/N8MOR	New Comer, General Discussion:
3/9/2023	Thursday	David/K6WOO	Rich/KN6HSR	Easy Tech Discussion:
3/16/2023	Thursday	Bill/AJ6UU	David/K6WOO	General Discussion:
3/23/2023	Thursday	Noah/AJ6XK	Bill/AJ6UU	Advanced Tech Discussion
3/30/2023	Thursday	Nate/N8MOR	Noah/AJ6XK	New Comer, General Discussion:

Regularly Scheduled Nets

Net Name	Frequency	Time	Frequency
LARK/LIVERMORE NET	Every MON.	1900 local 147.120+	PL 100
RACES Net 7pm	Every MON.		
Windfarms 10-10 NET	Every WED.	1930 local 28.485	USB
LARK TECH NET	Every THURS.	1930 local 147.120+	PL 100
LLNL Retiree Net	Every FRI 8:30 am	0830 local	7.2630 LSB
SWOT	Every Sun. & Tues.	2000 LOCAL	144.250 USB
THE NOON TIME NET	EVERY DAY	1200-1400 LOCAL	7.2685 LSB & 3970 LSB
RV RADIO NET	MON-FRI	0800-0930 LOCAL	7.2685 LSB

LARK CONTACTS 2023

**LARK—LIVERMORE AMATEUR RADIO KLUB P.O. BOX 3190,
LIVERMORE, CA 94550-3190. Web: <http://www.livermoreARK.org>.
E-mail list: livermoreark@groups.io**

GET YOUR HAM LICENSE OR UPGRADE. LARK conducts all levels of license testing (upon request) at the Livermore City Council Chambers following club meetings (3rd Sat. each month). Contact Ron Kane, AD6KV (AD6KV at arrl.net) 2 weeks in advance.

OFFICE	CONTACT	CALL	E-mail	Phone
President & Events	George Moorehead	KG6GEM	KG6WIU1@COMCAST.NET	(925) 516-2676
Vice President	Chris Quirk	W6CJQ	w6cjq@yahoo.com	925-202-1198
Secretary	Ryan Mahoney	W6RAM	Ryan.andrew.mahoney@gmail.com	925-786-0640
Treasurer	Bernie Bernstein	NJ6W	nj6w@xemaps.com	(925) 858-4608
Board (PP)	Roger Deming	KK6RD	rogerdeming@yahoo.com	(925) 484-1285
Board	David Counts	KG6WIR	dlcounts@sbcglobal.net	925-895-4698
Board	Nate Moore	N8MOR	nate@nateandamy.org	(925) 577-4916
Activities	Jerry Benterou	N5KA	benterou@gmail.com	925-321-3263
Repeater Chair	Ian Parker	W6TCP	w6tcpian@gmail.com	
Web Site	Arnold Harding	KQ6DI		
Newsletter Editor	Roberto Sadkowski	K6KM	rsadkowski@gmail.com	
Membership	Venkatesh Varadha (Var)	KM6TAB	svvenkatesh2786@outlook.com	(925) 961-7703
Net Coordinator	Ed Diemer	AE6D	ae6d@arrl.net	
RFI	Gary Johnson	NA6O	gwj@me.com	
T-Hunts	Rich Harrington	KN6FW		
Swap n Shop	Richard Combs	KN6HSR	KN6HSR@arrl.net	



Facebook—<http://www.facebook.com/LivermoreARK>
Twitter link : <https://twitter.com/LivermoreARK>



Special interests: Mesh Networking. Dave KK6DF <http://mesh.sushisoft.com> . <https://www.youtube.com/user/fanninsushi/videos>. View: AREDN!<http://www.aredn.org>. **CERT NEWS:** Tracy Hein CERT contact. Email: thein@lpfire.org or (925) 454 -2317 https://community.fema.gov/Register/Register_Program_View?id=a0xt000000mAuZAAE

Meetings 3rd Wednesdays. Remillard RM 3333 Busch Rd. Pleasanton.

LARK Membership Form



LARK LIVERMORE AMATEUR RADIO KLUB.

P.O. BOX 3190, LIVERMORE, CA 94551-3190

An ARRL Affiliated Club

LARK MEMBERSHIP FORM - Print, fill out, mail in with check.	
Circle all that apply: New / Renewing / Family Today's Date: _____	
NAME: _____	
CALL SIGN: _____	
ARRL MEMBER? Yes / No	
Address: _____	
PHONE: () -	
UNLISTED? ___ YES ___ NO	
Enter your E-mail here and stay connected: _____ LARK NEWS featuring upcoming club events and articles is available monthly via email. http://www.livermoreark.org/ Access the current and back issues on our website.	
ADDITIONAL FAMILY MEMBERS (At the same mailing address, only \$2. membership per person)	
NAME	
PHONE	
EMAIL	
ARRL MEMBER	
ANNUAL DUES # _____ PRIMARY (\$20.00) ADDITIONAL MEMBERS # _____ (\$2.00 each)	
TOTAL: \$ _____ MAKE CHECKS PAYABLE TO: LARK. Thank You.	
<p>Membership is \$20.00. per calendar year starting on Jan 1 through Dec. 31. To complete membership by mail: print and fill out this form, include a check payable to LARK, and mail to: LARK Membership Chairman, P.O. Box 3190, Livermore, CA, 94551-3190. Please be sure your complete mailing address, e-mail, and call sign are on your check. Questions? Contact the Membership Team via email: membership@livermoreark.org You may also complete membership application and payment by: Bringing this form filled out and pay by cash or check to either the Membership Chairman or Treasurer at any general meeting. Or: pay with a credit card or PayPal account on the Club's membership page: http://livermoreark.org/membership/membership.html.</p> <p>Thank you and welcome aboard from LARK and the Membership Team.</p>	