

# LARK NEWS December 2024



*Livermore Amateur Radio Klub LARK is an ARRL affiliated club dedicated to Public Service Volunteer Emergency Communications. Meetings are once a month on the 3<sup>rd</sup> Saturday 9:30AM*

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

*Available live via zoom by invitation only. Visitors Welcome*

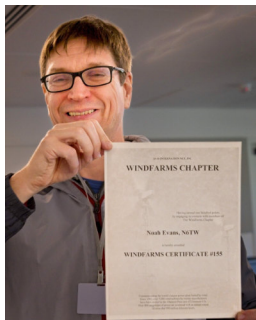
**Editor: Gregory Kiyoi KN6RUQ**



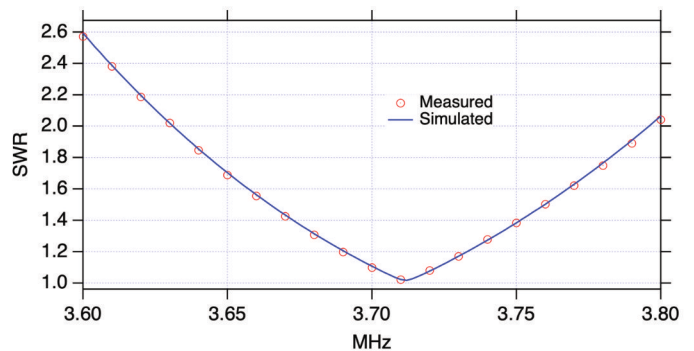
*Photo by Roberto K6KM*



*Jim W6JIM and George KG6GEM  
Photo by Jerry N5KA*



*Noah N6TW  
Photo by Jerry N5KA*



*Graph by Gary, NA6O*

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# Presidents Message

I want to thank **Noah N6TW** for making the coffee and picking up the refreshments for monthly meetings. This effort is appreciated by all who attend the meeting.

I wanted to let you know that the Events Chairperson (me) is following the upcoming events for 2025, and I have an update. The following events will be happening:

- **Race to the Flagpole, Saturday, January 25<sup>th</sup>**
- **Livermore Half Marathon, Sunday, March 2<sup>nd</sup>**
- **Cinderella Bike Ride, Saturday, April 5<sup>th</sup>**
- **Devil Mountain Run, Sunday, May 4<sup>th</sup>**

We are in need of volunteer radio support for all events and any level of experience is welcome.

As more events are confirmed you will be kept advised. Make sure to sign up on the LARK website for these events for which LARK supports.

The **LARK Swap-n-Shop** will need a new Chairperson starting in January, if you would be interested in helping in this position please contact me as soon as possible.

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.

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 AE6D** 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 stay healthy, stay safe, and have a great holiday season.

**George KG6GEM** ([kg6wui1@comcast.net](mailto:kg6wui1@comcast.net))

# Notes from the Editor

## Monthly Meeting Presentation

Thank you to **Jim Crites W6JIM** from Long Island CW club. It was a very informative presentation on learning CW and improving speed. See <https://longislandcwclub.org> for more information.



Photo by Jerry N5KA

The meeting was well attended with 62 attendees (52 members, 3 guests, and 7 online). This was the largest member turnout of the year.

Congratulations to **Noah N6TW** for becoming a TEN-TEN Windfarms Net member #155.

## Good Fist: Jesse H. Bunnell

You might ask who is “Jesse”? He was born this month on November 28, 1843 and was a CW telegraph operator.

At 13 years old he became a full-time telegraph operator. At 17 he set a telegraph speed record, established while transmitting President Buchanan’s last message to Congress. The speed was about 32 words per minute for 2 hours.

## ISS SSTV

The week of November 11<sup>th</sup> the ISS transmitted daily images. It was on 145.800 in PD120 format. The transmissions were very early in the morning Pacific time.

I set my radio to record the transmissions. After, I copied the recordings to my computer. Loaded into audacity audio editor to convert to

a 11025 Hz mono file. Finally, used mmsstv (by **Makoto JE3HHT**) to decode the image. My recordings had a lot of noise so the images were not as clean as I wanted. I am still tinkering with audacity to remove noise. Maybe **Don W2DON** can help me!

I did find a better image capture for the Friday broadcast and here is what it looks like.



For more information see <https://amsat-uk.org/2024/11/11/space-station-slow-scan-tv-transmissions-2/> Last year over Christmas and New Year’s there were SSTV broadcasts.

Thank you to all that send articles, pictures, and other content.

Please keep sending them to me.

[Gregory KN6RUQ](#)



# Monthly Meeting Minutes



## **LARK General Meeting | November 16, 2024 | Minutes**

The meeting was called to order by President George KG6GEM at 9:30am.

Introductions of all present at the meeting were done including members who were virtual. Total number meeting participants was: 62

The presentation was from Jim Crites W6JIM on the topic of "A Fun Way to Learn Morse Code", he is from the Long Island CW Club.

A brief break for coffee and donuts, thanks to Noah N6TW for preparation and having this available for each meeting.

### **Officer, Board and Chairperson Reports:**

- **Peter AI6RG: Treasure** reports that LARK finances are stable.
- **Newsletter: Greg KN6RUQ** requests that any items for the Newsletter be in by Sunday evening.
- **Membership:** 2025 membership drive is on so please start renewing your memberships.
- **Events: George KG6GEM** – look for sign-ups for upcoming events in 2025 to be available soon. 2024 events are all completed.
- **Activities: Jerry N5KA** – December meeting is the annual white elephant gift exchange and the awarding of the 'Brick' to some lucky club member; January meeting will be members Show-n-Tell as well as new equipment and projects; February will be Roberto with a presentation with antennas for portability; after that we are looking for more presentations for 2025, if you have any ideas please let Jerry or Steve or George know.
- 2025 Pacificon will be the 2<sup>nd</sup> weekend of October in San Ramon.

**September meeting minutes** were approved by the membership with a show of hands. **V/E session** following the meeting today.

**Technical Interest Groups:** Ron AD6KV indicates that the satellite comms group will restart soon.

**Pacificon:** the Swap Meet, and the LARK booth were successful and our help in staffing and coordinating the Swap Meet is very much appreciated by MDARC.

**Cycle for Hope Bike Ride Event:** George KG6GEM – reported that the event went very well with the Net Control support of needed equipment from Bill Hoover AJ6UU, the equipment provided Net Control the opportunity to follow the assigned trackers on the SAGs and Sweeps. This event was very successful.

**Swap-n-Shop Chairperson:** Rich is retiring at the end of the year and LARK needs to find a replacement chairperson for Rich. Rich has done a fantastic job for LARK. If you are interested, please contact George KG6GEM.

**Klutz Awards:** No awards this meeting.



**Operating:** Roberto told the group about operating in Brazil recently as well as 6 meters.

**Ask the Elmer:** Lee KI6OY: Lee presented Noah N6TW with a certificate as he becomes TEN-TEN Windfarms Net member #155. Lee answered technical questions from the membership.

The meeting adjourned at 11:31am.

Minutes submitted by:

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George Moorehead KG6GEM for Ryan Mahoney W6RAM- LARK Secretary

# Board Meeting Minutes



## **LARK Board Meeting | November 11, 2024 | Minutes**

**Attendees:** George, Chris, Ryan, Nate, Jerry, Peter, Bernie, Julian, Jerry

**Absent:** David, Roger

### **Call to Order**

1. Meeting called to order by George at 7:30 PM.

### **Treasure's Report – Peter**

1. The club's finances are in good shape. Rich Combs is doing well with sales and Julian with memberships.

### **Membership – Julian**

1. Julian will start working on membership renewals

### **Repeaters – Nate**

1. Nothing significant to report

### **Activities – Jerry**

1. November: A fun new way to learn Morse Code
2. December: White Elephant Gift Exchange
3. January: Activities
4. Looking for someone to take over and
5. Jerry and Steve K8YIP are working on 2025 and welcome any suggestions.

### **Events – George**

1. Race to the Flagpole January 25<sup>th</sup>
2. Sunday March 2<sup>nd</sup> Livermore Half Marathon
3. Saturday April 5<sup>th</sup> Cinderella
4. Sunday May 4<sup>th</sup> Devil Mountain Run
5. Signups will be posted soon on website and newsletter for 2025 events

### **501(c)3 – Bernie**

1. IRS processing requests prior to February 13<sup>th</sup>
2. Effective date would be the date of application submission

### **Pacificon – George**

1. LARK staffed the club booth for both Saturday and Sunday.
2. Another successful Swap Meet. MDARC appreciates the support from LARK for the help in organizing and working this event.
3. Nate brought up that we should create a business card size of club information that can be handed out

### **SWAP AND SHOP – George**

1. Rich KN6HSR is retiring from being a lead for Swap and Shop chair, looking for new volunteer. The board commented how great Rich has done as the chair.

**Adjournment**

1. George adjourned the meeting at 8:07 PM.

Minutes submitted by:

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Ryan Mahoney (W6RAM)- LARK Secretary



# Community Activities



**We NEED You!  
Sign Up NOW**

LIVERMORE GRANADA BOOSTERS ANNUAL

## Race to the **FLAGPOLE**

**Race to the Flagpole - Saturday, January 25, 2025**

*Signup Link Coming Soon*

This is the Livermore Granada Booster's main fundraiser of the year, and all proceeds go towards the Livermore Granada Boosters Olympian Scholarship program. This event is open to all ages and abilities. We host this event to encourage awareness and appreciation for fitness, as well as to foster community pride.



**Livermore 1/2 Marathon - Sunday, March 2, 2025**

*Signup Link Coming Soon*

Experience our event and course, with postcard views and a synchronized queue of our amazing wildlife, you'll enjoy a full sensory moment, as you pass through gorgeous vineyards, lush hop vine fields, mature olive groves and so much more.



**48<sup>th</sup> Cinderella Bike Ride - Saturday, April 5, 2025**

*Signup Link Coming Soon*

The Cinderella Classic, Challenge and Short rides are 65/100/35-mile recreational bicycle ride (not a race) for women & girls only.



**Devil Mountain Run - Sunday, May 5, 2025**

*Signup Link Coming Soon*

This event takes place in downtown Danville and is a foot race - 5K, 10K, and One Mile fun run.

# Antenna of the Month

## Measuring Ground by Gary, NA6O

Ground conductivity and dielectric constant (relative permittivity) directly affect the performance of our antennas. When simulating an antenna, getting these values wrong will result in errors in the pattern and feed point impedance. This is especially true for designs that have elements close to the ground, such as radials, or any kind of low antenna. Results may be so far off as to turn you into a non-believer in simulation when you actually build and test your design.

Simulators like EZNEC include default parameters for various types of ground with names like “extremely poor” and “very good.” The corresponding numeric values (also published in the ARRL Antenna Book) are derived from 1939 FCC measurements intended for use in the broadcast band.

However, soil parameters vary quite a bit with frequency, thus guaranteeing errors when applied to the HF bands. But you can get better values from a webpage provided by **Brian Beezley, K6STI**. Brian assembled some charts and tables [Ref 1] that extrapolate those BC band data to the HF bands for much-improved accuracy. It's better to start with that information.

Then there is another matter: What kind of soil do you actually have? The FCC has a map of ground conductivity for the USA [Ref 2]. Once again it's for the BC band so the values need correction, and your particular location could be different due to all sorts of alterations to the local soil and of course moisture content. Also the map only shows conductivity but not permittivity. So this is again only a partial solution.

### When in Doubt, Measure It

Yes, you can directly measure your local ground constants. There are at least two ways. One is to use a special dielectric probe that is inserted into the ground and connected to an impedance analyzer [Ref 3]. After applying a formula, reliable results are obtained. Of course you need to make

the special probe and it only measures data at single points. But it's an excellent technique.

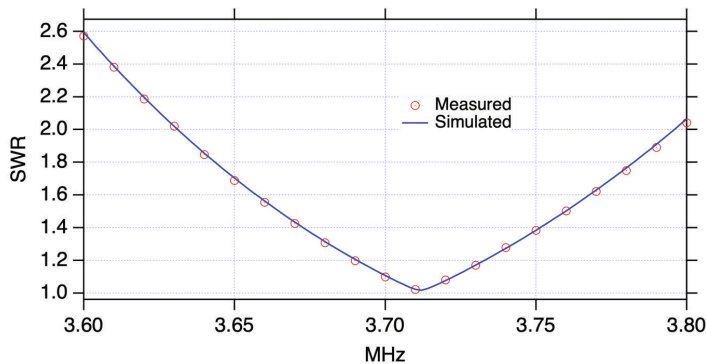
Another way to do the measurement is with a low dipole [Ref 4]. The beauty of a dipole is that it's easy to build and easy to simulate accurately. Basically you measure it's impedance and then in EZNEC you simulate the antenna geometry exactly and then adjust the ground parameters until the results match. The other advantage of this method is that it averages a large volume of soil. All you need is some wire, insulated supports, and enough space to string it up a few feet above the ground. Height is not important—3 to 5 feet is fine—as long as you *know* the height accurately. Also it will make simulation easier if you run it in a straight line. Finally, you will need a good common-mode choke at the feed point to prevent your (short length of) coax and equipment from becoming part of the antenna [Ref 5]. And of course you need a reliable impedance measurement device that displays complex impedance ( $R+jX$ ). I used my Rig Expert AA-230 but a NanoVNA or many other instruments are fine.

### Some Actual Results

My friend **Greg, KK6PXT**, has been considering purchase of some new property so I went along to do RFI measurements with portable antennas. While I was at it, I put up a full-length 80 m dipole at 4 ft off the ground. It was made from 18 AWG magnet wire and had a good choke at the feed point. When I measured it, resonance was at 3710 kHz and  $49.2+j0$  ohms. I also saved an SWR scan for later comparison.

The *exact* geometry (including the 3-foot feedline) was simulated in EZNEC using the NEC5 engine and a real/extended accuracy ground. (NEC 2 will be pretty close too; just be sure to use real/high-accuracy ground.) Ground properties were varied by guessing until results perfectly matched simulation; it took me about 15 runs. I was focused on matching the impedance at resonance and finally nailed it. The result was conductivity = .0232 S/m, dielectric constant = 41.

In the graph below, SWR data from my antenna analyzer and from the simulation are overplotted. This is a great validation of simulation! If I did not do this measurement, and didn't know better, I'd use the default values for "poor rocky soil", .002/13. That's way off, with resonance appearing 6 kHz low and  $Z = 95 + j0$ .



Now that we know the values on 80 m, we can use the information from Ref. 1 to extrapolate to other bands. It turns out that I could have taken data on other bands while using this same antenna and then run the simulation at those other frequencies, again looking for matching impedances. In that case you do have to watch out for extremely high or low impedances where your analyzer may exhibit large errors.

### Conclusion

Don't trust the generic default values for ground constants. At the very least, use the estimates discussed here. Or dig into your junk box and put up a simple dipole, then spend some quality time with EZNEC. You may want to repeat the test in wet and dry conditions as well. At last, you will have accurate ground data for your property and future simulations will be much more accurate.

### Additional Comments Regarding Accuracy

I had some discussion with Brian Beezley and he noted that like any metrology endeavors, the absolute accuracy of this measurement depends on more than just the wire geometry. First, the end insulators and even the small loops of wire have to be accounted for. Actually, minimizing them is probably the way to go. A minuscule insulator made from a small-diameter rod of low-loss polymer (e.g.,

polystyrene, Teflon, polyethylene) or fiberglass would be ideal. Then the loop of wire may also be negligibly small.

The other thing is your connection to the analyzer. Excess capacitance from cables and connectors must be included in the simulation or somehow minimized to a negligible level. Hand or ground capacitance is also a problem. Rudy found that his VNA had to be elevated off the ground with no hand contact, otherwise results would vary. My best solution is to solder the antenna wires directly into an N connector that's plugged into my Rig Expert analyzer. After pressing the start button, I can let go of it and walk away while it does its slow scan. Residual capacitance is very small, and there is essentially no feedline at all.

### References

1. Brian Beezley, K6STI, "HF Ground Constants". <http://ham-radio.com/k6sti/hfgc.htm>
2. FCC, "M3 Map of Effective Ground Conductivity in the United States for AM Broadcast Stations". <https://www.fcc.gov/media/radio/m3-ground-conductivity-map>
3. Rudy Severns, N6LF, "Measurement of Soil Electrical Parameters at HF" QEX, Nov/Dec 2006. <https://rudys.typepad.com/files/qez-nov-dec-2006-soil-parameters-at-hf.pdf>
4. Rudy Severns, N6LF, "Determination of Soil Electrical Characteristics Using a Low Dipole" QEX, Nov/Dec 2016. <https://rudys.typepad.com/files/qex-nov-dec-2016-soil-characteristics-using-low-dipole.pdf>
5. Jim Brown, K9YC, "A New Choke Cookbook for the 160-10m Bands". <http://k9yc.com/2018Cookbook.pdf>

### Next Month: Half Sloper

Everyone should explore **EZNEC** a free and very powerful program, available from <https://www.eznec.com/> and discussed in the *ARRL Antenna Handbook* among other places.

# Visit to LABRE

**Roberto Sadkowski, K6KM**

## **Visit to LABRE (Liga de Amadores Brasileiros de Radio Emissão)**

During my recent trip to Brazil, I had the pleasure to pay a visit to LABRE in Sao Paulo (the equivalent to ARRL). The headquarters for the State of Sao Paulo is located near the Metro Station Carrão. A 12 minute easy stroll rewards you with the view of a multi-band Quad, visible from a block away.



The night before, my friend **Fabio PU2KLM** alerted me that I still didn't go to LABRE and gave me the call sign of who might be my contact there, **Clovis PY2KG**. I sent an email Wednesday night hoping to get an answer quickly as I was scheduled to leave town Thursday afternoon.

Morning of Thursday I did not have a response yet. I felt somehow lucky and decided to risk a trip to LABRE. That was two metro lines and the walk. When I arrived Clovis met me as he didn't read my email yet.



*Clovis PY2KG  
and Roberto  
PY2/K6KM*

We chatted for awhile about all things Amateur Radio. From SOTA/POTA, QRP, QRO, Contesting, rigs, etc... He gave me a tour of the premises. First to the tower with an impressive homebrew multi-band quad.



It turns out they built it with solid fiberglass and the weight of that antenna is some 200lbs. There is an effort to procure hollow fiber glass as to make the antenna much lighter in the future.

Upstairs there are several rooms. One serves as CW training and general classes.



Clovis explained to me that in the last few years, 22 story towers have been sprawling all around the house encircling it. The result is poor antenna reception with lots of QSB even for domestic signals.

They are considering yet another move farther away or perhaps remote operation.

Brazil has around 40k licensed radio amateur operators. Sao Paulo hosts a big portion of those as the city itself has 22Million inhabitants. However, Paulistas are busy people and he finds other Hams in Rio and in the South (Parana, Santa Catarina) more active.

Next door is a general meeting room. Then there is the Bureau room which Clovis administers.

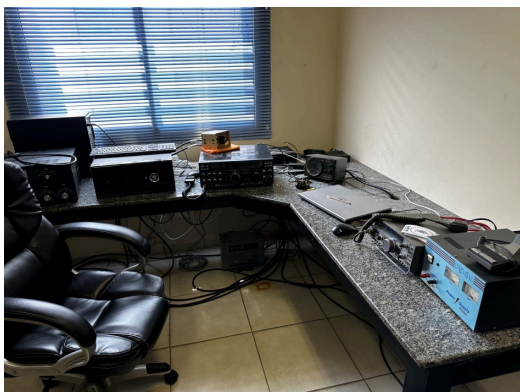


We discussed my “Work all Brazil” award. Clovis did not finish it yet. Well, he doesn’t do FT8.

I went with very low expectations and left with a Labre Polo shirt, a few pins, a head full of memories and new friends. That is the most rewarding aspect of the hobby.

At the time of my visit Clovis was ready to ship a big pile of cards to DL (Germany).

Finally there’s the operating room, outfitted with some rather aged but fully functional equipment.



# Swap n' Shop Cave

Looking for a new Shop Keeper!



Big thank you to **Rich KN6HSR** that has done an amazing job with the Swap n' Shop Cave.

He has brought a lot of great equipment and deals to LARK members. Also has provided a revenue stream to the LARK coffers!

He is going to retire so this means a new volunteer is needed. If you have a little garage space you can help fill this role.

For details please contact **Rich KN6HSR** or **George KG6GEM**.

# December Calendar

<u>Monday</u>	<u>Tuesday</u>	<u>Wednesday</u>	<u>Thursday</u>	<u>Friday</u>	<u>Saturday</u>	<u>Sunday</u>
						1
2 Net	3	4 10-10 Net HH Net	5 Tech Net	6	7	8
9 Net	10	11 10-10 Net HH Net	12 Tech Net	13	14 LARK Meeting	15
16 Net	17	18 10-10 Net HH Net	19 Tech Net	20	21	22
23 Net	24	25 No Net	26 Tech Net	27	28	29
30 Net	31					

**LARK MONDAY NIGHT NET**  
**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

### October

Date	Net Control
10/7/2024	Ed / AE6D
10/14/2024	EOC
10/21/2024	John / WB6ETY
10/28/2024	Jon / WB6AEA

### November

Date	Net Control
11/4/2024	Ron / AD6KV
11/11/2024	EOC
11/18/2024	Ed / AE6D
11/25/2024	John / WB6ETY

### December

Date	Net Control
12/2/2024	Jon / WB6AEA
12/9/2024	EOC
12/16/2024	Ron / AD6KV
12/23/2024	Ed / AE6D
12/30/2024	John / WB6ETY

**EVERYONE** is invited to check in to the net. Please contact AE6D [ae6d@sbcglobal.net](mailto: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	Primary Net Control	Backup Net Control
10/3/2024	Noah / N6TW	Bill / AJ6UU
10/10/2024	Nate / N8MOR	Noah / N6TW
10/17/2024	Brian / KA6ZED	Peter / AI6RG
10/24/2024	Nate / N8MOR	Brian / KA6ZED
10/31/2024	Rich / KN6HSR	Nate / N8MOR
11/7/2024	David / K6WOO	Rich / KN6HSR
11/14/2024	Bill / AJ6UU	David / K6WOO
11/21/2024	Nate / N8MOR	Noah / N6TW
11/28/2024	HOLIDAY	NA
12/5/2024	Brian / KA6ZED	Peter / AI6RG
12/12/2024	Nate / N8MOR	Brian / KA6ZED
12/19/2024	Rich / KN6HSR	Nate / N8MOR
12/26/2024	David / K6WOO	Rich / KN6HSR

## Regularly Scheduled Nets

LARK/LIVERMORE NET	Every Mon	1900 local 147.120+	PL 100
RACES Net	Every MON.	1900 local	
Windfarms 10-10 NET	Every WED.	1930 local 28.485	USB
HamShack Hotline Net	Every WED.	1900 Bridge 363	PIN 0331
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	EVERYDAY	1200-1400 LOCAL	7.2685 LSB & 3970 LSB
RV RADIO NET	MON - FRI	0800-0930 LOCAL	7.2685 LSB



# LARK Contacts

**LARK—LIVERMORE AMATEUR RADIO KLUB P.O. BOX 3190,  
LIVERMORE, CA 94550-3190. Web: <http://www.livermoreARK.org>  
E-mail list: [livermoreark@groups.io](mailto: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	<a href="mailto:kg6wiu1@comcast.net">kg6wiu1@comcast.net</a>	925-516-2676
Vice President	Chris Quirk	W6CJQ	<a href="mailto:w6cjq@yahoo.com">w6cjq@yahoo.com</a>	925-202-1198
Secretary	Ryan Mahoney	W6RAM	<a href="mailto:ryan.andrew.mahoney@gmail.com">ryan.andrew.mahoney@gmail.com</a>	925-786-0640
Treasurer	Peter Bedrossian	AI6RG	<a href="mailto:p.bedrossian@comcast.net">p.bedrossian@comcast.net</a>	925-606-1342
Board (PP)	Roger Deming	KK6RD	<a href="mailto:rogerdeming@yahoo.com">rogerdeming@yahoo.com</a>	925-484-1285
Board	David Counts	KG6WIR	<a href="mailto:dccounts@sbcglobal.net">dccounts@sbcglobal.net</a>	925-895-4698
Board	Nate Moore	N8MOR	<a href="mailto:nate@nateandamy.org">nate@nateandamy.org</a>	925-577-4916
Activities	Jerry Benterou	N5KA	<a href="mailto:benterou@gmail.com">benterou@gmail.com</a>	925-321-3263
	Steve Nissen	K8YIP	<a href="mailto:s.nissen55@gmail.com">s.nissen55@gmail.com</a>	650-270-3796
Repeater Chair	Ian Parker	W6TCP	<a href="mailto:w6tcpian@gmail.com">w6tcpian@gmail.com</a>	
Web Site	Arnold Harding	KQ6DI		
Newsletter Editor	Gregory Kiyoi	KN6RUQ	<a href="mailto:gkiyoi@gmail.com">gkiyoi@gmail.com</a>	925-456-4734
Membership	Julian Riccomini	WB6BDD	<a href="mailto:wb6bdd@gmail.com">wb6bdd@gmail.com</a>	
Net Coordinator	Ed Diemer	AE6D	<a href="mailto:ae6d@arrl.net">ae6d@arrl.net</a>	
RFI	Gary Johnson	NA6O	<a href="mailto:gwj@me.com">gwj@me.com</a>	
T-Hunts	Brian Zoraster	KA6ZED	<a href="mailto:ka6zed@gmail.com">ka6zed@gmail.com</a>	925-786-8412
	Rich Harrington	KN6FW		
Swap n Shop	Richard Combs	KN6HSR	<a href="mailto:kn6hsr@arrl.net">kn6hsr@arrl.net</a>	
Ask the Elmer	Lee Zalaznik	KI6OY	<a href="mailto:lee.zalaznik@sbcglobal.net">lee.zalaznik@sbcglobal.net</a>	925-699-5998



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



**Special interests:** View: AREDN Mesh <http://www.aredn.org>.

**CERT NEWS:** CERT contact - Email: [cert@lpfire.org](mailto:cert@lpfire.org) or (925) 454-2361

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

# LARK Membership Form



1-

An ARRL Affiliated Club

-	
Circle all that apply: New /                      /Family	
NAME: CALL SIGN: _____ ARRL MEMBER? Yes / No	
Address:	
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<b>ARRL MEMBER</b>	
<p>Membership is \$20 <span style="float: right;">To complete</span></p> <p style="text-align: center;">P.O. Box 3190, Livermore, CA, 94551-3190 Please be sure -mail, and call sign are on your check.</p> <p>Contact the Membership Team                      <a href="mailto:membership@livermoreark.org">membership@livermoreark.org</a></p> <p>cash or check to either                      Or: pay with a credit card or PayPal account on the Club's membership page:</p> <p style="text-align: right; color: green;">Team.</p>	