LARK NEWS June 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

Content:

President's Message

I want to thank Bernie NJ6W and David KG6WIR for making the coffee and picking up the refreshments for monthly meetings and would like to have someone help him if possible. This effort is appreciated by all who attend.

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: LARK Field Days on June 24th and 25th at the Livermore Airport, The Patterson Pass Road Race on Sunday, August 6th. 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.

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 stay healthy and stay safe.

George KG6GEM
(kg6wiu1@comcast.net)

Notes from the Editor

Action packed month with LARK public service, great monthly meetings and good weather for outdoor activities.

I'm glad to receive articles from our Members. I do get them sporadically and it is refreshing to see the collaboration.

As I said before, this is your Newsletter so if you wish to see a certain content in it, please let the Editor know, otherwise he will keep talking about SOTA.

I am back from my first Tahoe Sota activation trip (There you go) this year. Lots of snow still up above 7000 feet. Things are starting to melt but I had my first lessons in snow activation (albeit at 65F).

My friend Derek W7DLZ made SOTA Mountain Goat and I promised to be there with him to celebrate on his activation.

Gary NA6O and I went to activate a peak in Livermore for the first time ever. That was a treat. You can see the article in this Newsletter. It was also Gary's first SOTA activation.

Lots of interesting contests going on if you want to brush up on your operating skills. Unlike Net Controls, these are chaotic operations where everybody wants to work everybody and as fast as possible. Certainly a situation you can be faced with as a Net Control in case of a real emergency.

Next month, yours truly will be activating some SOTA peaks in South America, so more articles to come if you're not already bored.

Roberto K6KM

Board Meeting Minutes

LARK Board Meeting | May 15, 2023 | Minutes

Attendees: George, Chris, Jerry, Bernie, Roger, Nate
Absent: Ryan, David,

Call to Order
1. Meeting called to order by George at 7:45 PM.

Treasure's Report – Bernie
1. The club's finances are solid, there was a deposit from estate and SK sales.

Repeaters – Nate
1. There were reports of possible issues with ODP repeater in the past few weeks, it is being researched to determine if there are issues, Nate is following up on reported issues.

Activities – Jerry
1. Presentations for the balance of the year for the monthly meetings are covered.

Events – George
1. Field Days on June 24th and 25th
2. Patterson Pass Road Race on Sunday, August 6th
3. Pacificon Booth and Swap Meet activities on October 20, 21, and 22 at the San Ramon Marriot

Field Day – George
1. The board approved the budget of $600 for Field Days 2023.

Equipment Insurance – Bernie
1. The board discussed getting replacement insurance coverage for all LARK repeaters and associated equipment for approximate cost of no more than $200 per year through ARRL insurance provider. The board will hold further discussions of the ODP repeater, digipeaters, etc. due to its location.
2. This was approved

Adjournment
1. George adjourned the meeting at 8:30 PM.

Minutes submitted by:

_____
Ryan Mahoney (W6RAM) – LARK Secretary

LARK General Meeting | May 20, 2023 | Minutes

Call to Order
1. Meeting called to order by George KG6GEM at 9:32 AM.
2. George started introductions, first of In-Person attendees and then Zoom attendees.
3. 41 members / 6 guests = 47 total attending the meeting.

Presentation
1. George introduced John Trinterud K9ONR for his presentation on Using WINLINK for Emergency Comms in the Bay Area.

Treasure's Report– Bernie NJ6W
1. Rich participated in Swap meet and sold equipment in Santa Clara

Activities – Jerry N5KA
1. June: Gary N6AO Beacons: How Do I Know I'm Getting Out
2. July: Richard from National Radio Historical Society in Pt. Rays
3. August: Lee KI6OY How to get started in Contesting
4. September Gary NA6O New Towers
5. October: Pacificon - No Meeting
6. Looking for speakers, any ideas please contact Jerry

Events – George KG6GEM
1. All confirmed event signups are available on the LARK website.
2. August 6th Patterson Pass Road Race
3. Field Day - June 24th and 25th, contact Nate N8MOR

V/E Testing – Ron AD6KV
1. No test today

ARES – Ron AD6KV
1. Continue to make progress

Field Day – George KG6GEM
1. Field Day is 6/24 and 6/25 at Livermore Airport
2. BBQ during the day, contact Nate N8MOR for more information

Old Business
1. Minutes from the March meeting approved unanimously.

Klutz Award Nominations
1. No nominations

Operating
1. None

Ask an Elmer – Lee KI6OY

Working on a project and have a question? We can find people that have a question. Please contact Lee by email or phone.

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

Minutes submitted by:

6

_____

Ryan Mahoney (W6RAM)– LARK Secretary

LARK Field Day June 24,25 2023   Ron: AD6KV

LARK members will be participating in the 2023 Field Day Operation on June 24 and 25. This is an opportunity to practice field operations with your equipment and have a good time working with others. Our normal approach to FD is to meet for set up at about 9 AM and discuss what we're going to do, usually over coffee, standing in the field north of the Livermore Airport parking area. Once some basic decisions are made the operators commence with setup and checkout of their stations and await the 11 AM local start of the event. Most participants in our recent years have not been hardcore operators, rather this is an opportunity for learning and camaraderie. LARK will provide for a later afternoon BBQ and social event in the tree area east of the operating field. Members and family are invited and more details on what to bring will be sent out soon.

After the BBQ some members return to operating and demonstrating how their equipment works, some may spend the night participating. Usually around 9 AM Sunday morning we're ready to dismantle and return our gear to home stations. This is an opportunity to learn how to prepare for emergency operations as well as have fun making contacts with others around the world. Come join us! Watch for further information in the newsletter, in emails and on our Monday night Net.

Patterson Pass Road Race   Sunday, August 6, 2023

This event takes place in the hills east of Livermore.

The races start at 8am and finish about 1pm. The ham radio volunteer are there to provide emergency communications at planned stationary posts from 7am-1pm approx., there will be a radio check-in at 7:45am.
The ham radio volunteer should be able to handle this assignment with a handheld.

Amateur Radio coordinator:
 George Moorehead, KG6GEM   kg6wiu1@comcast.net

Sign Up online here:
https://www.signupgenius.com/go/10C0844AEAD28A6FA7-patterson1
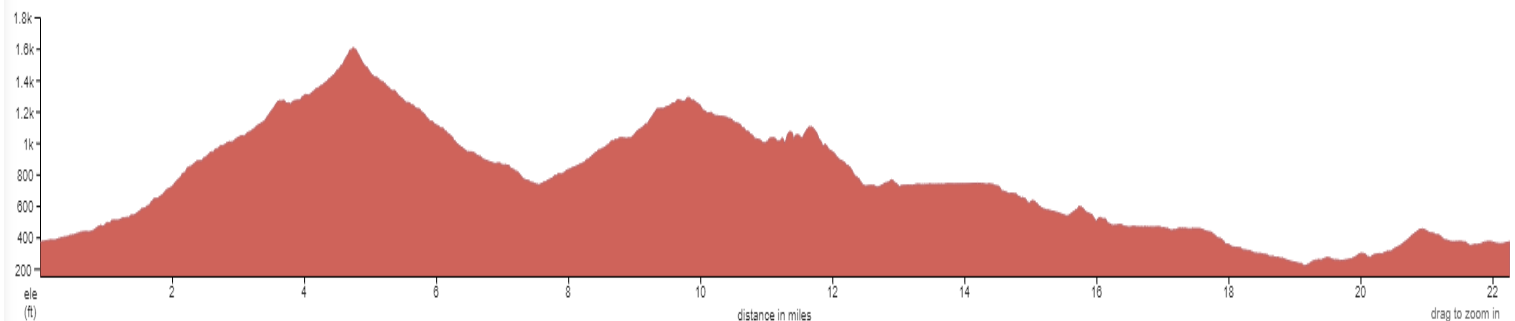
Monthly LARK Presentation

LARK - Livermore
Winlink Overview 05/20/2023

John Trinterud
K9ONR
ARRL East Bay Section
Technical Specialist

Winlink Building Blocks – so what is Winlink?

Winlink Global Radio Email
...is a network of amateur radio and authorized government-licensed stations that provides **worldwide radio email using radio pathways** where the internet is not present.
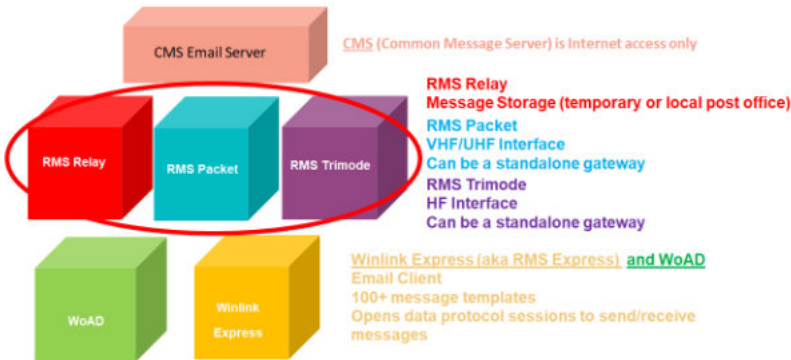
The system is built, operated and administered entirely by licensed "Ham" volunteers. It supports email with attachments, position reporting, weather and information bulletins, and is well-known for its role in interoperable emergency and disaster relief communications

It is capable of operating completely without the internet--automatically-- using smart-network radio relays. Licensed Winlink operators/stations use both amateur radio and government radio frequencies worldwide.

Winlink Building Blocks - fitting them together

CMS (Common Message Server) is Internet access only

RMS Relay
Message Storage (temporary or local post office)

RMS Packet
VHF/UHF Interface
Can be a standalone gateway

RMS Trimode
HF Interface
Can be a standalone gateway

Winlink Express (aka RMS Express) and WoAD
Email Client
100+ message templates
Opens data protocol sessions to send/receive messages

Winlink Building Blocks – Simple Email Clients
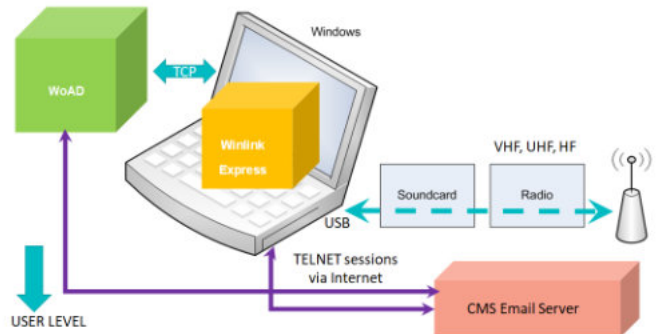
Winlink Building Blocks – Simple VHF/UHF Gateway

K9ONR (VARA FM)
K9ONR-10 (Packet)
145.630 in CM87WV

Single Frequency, no rig control
External   VHF or UHF

RMS Packet

Soundcard   Radio

Internet

CMS Email Server

RMS Level
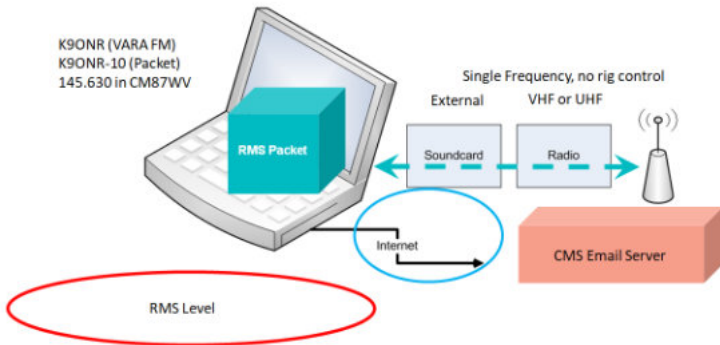
Winlink Building Blocks – Simple HF Gateway

Multiple bands and frequencies; Trimode can control the radio

Internal or External   HF

RMS Trimode

Soundcard   Radio

Internet

CMS Email Server

RMS Level
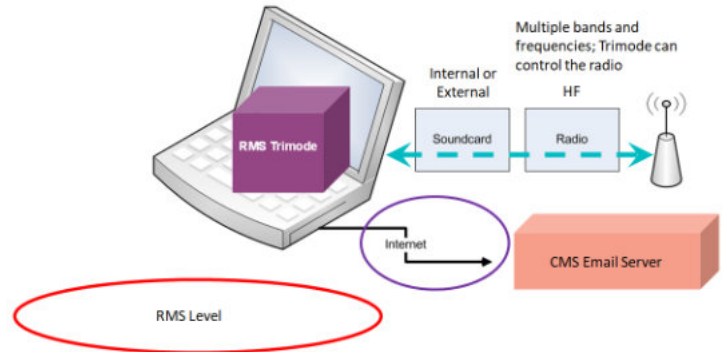
Winlink Building Blocks – HF Forwarding to Gateway

Temporary message storage

RMS Relay   RMS Trimode

Soundcard   HF Radio

Soundcard   HF Radio

RMS Level

RMS Trimode

CMS Email Server
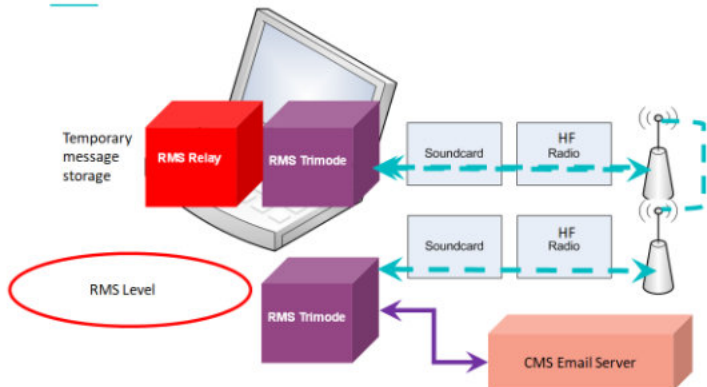
Winlink Building Blocks – Multiple Gateway

Need two radios, this won't work on an all-band rig like a Yaesu 991a

RMS Packet

Soundcard   VHF/UHF Radio

RMS Relay

RMS Trimode

Soundcard   HF Radio

RMS Level
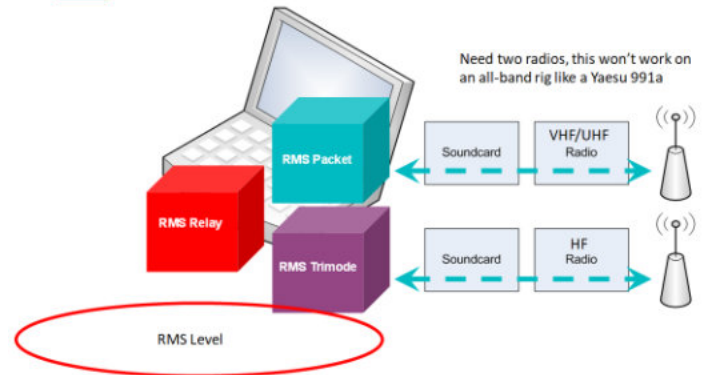
Winlink Building Blocks – Standalone VHF/UHF RMS

Local Post Office

RMS Relay   RMS Packet

Soundcard   Radio

No Internet and no HF capability!
Not part of the Winlink Network!
OK, why would we do that?

This configuration is used for Walnut Creek CERT and their EOC. They operate without Internet service.
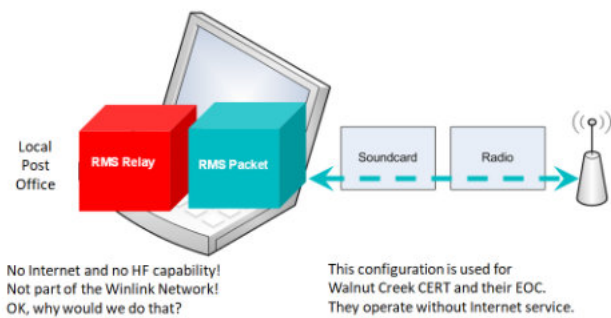
Winlink – Supported Data Protocols

VHF and UHF

Packet (AFSK AX.25 1200 baud)

VARA FM Narrow (10X packet) through the mic jack
License for full speed

VARA FM Wide (20X packet) "real" 9600 data jack
License for full speed

HF (Check out " A comparison of Winlink® digital mode performance based on simulation results using the Teensy IONOS Simulator" by Tom Whiteside, N5TW (available by email from me)

Packet
Robust Packet
ARDOP
VARA HF
Pactor(s)
Iridium GO

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Winlink Building Blocks – Three Message Types

- **Winlink**

  Messages are addressed to a specific user(s), and sent by radio to the call sign of a RMS Gateway, which relays them to CMS. This allows sending and receiving external emails and CC copies (Gmail, etc.) Messages are stored at both ends with Message ID numbers. Recipient does not have to be online. This is the preferred message type.

- **Peer to Peer (P2P)**

  One user to one user, direct connection, by call signs. Winlink Express to Winlink Express only, RMS and CMS are not used, no external emails, no CC. User level message storage at both ends with Message ID numbers. Originator and recipient must be on line NOTE with manual coordination of same frequency and data protocol.

- **Radio Only (RO)**

  HF and Pactor only, Internet and CMS are not used. Users must define 2 or 3 Message Pickup Stations (MPS). One user to one user with Message ID numbers; no external emails, no CC. This is a complex and slow message transfer process that is not recommended for EMCOMM.

It sure looks like email, but... what are "Sessions"?

Winlink for Walnut Creek CERT
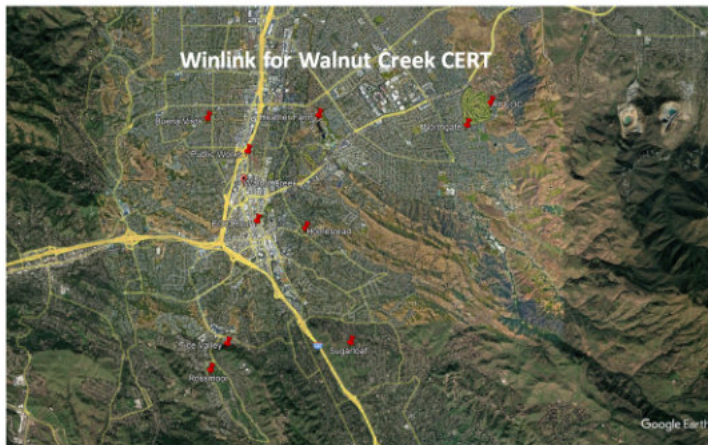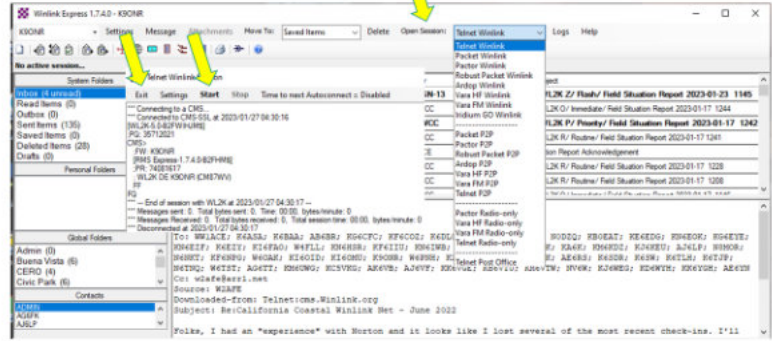
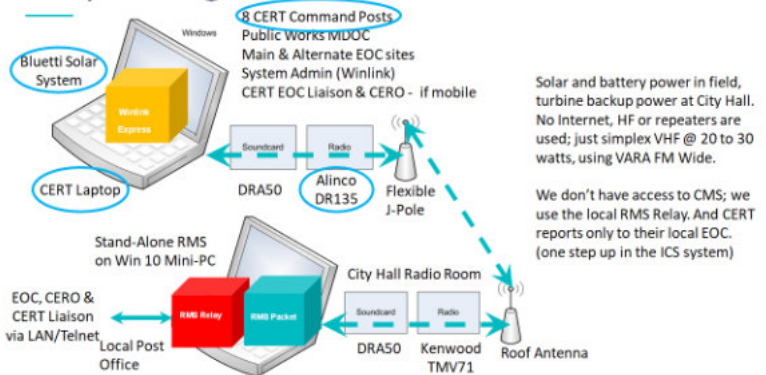## EOC Requirements for CERT Reporting

Goal: Rapid city-wide situational awareness - ASAP

1. Life Threatening <u>Incidents</u>

   Reported as they are identified

2. Major Infrastructure <u>Incidents</u>

   Reported as they are identified

3. Status <u>updates</u> from the last report

   Operational Period Reports, or on demand by EOC/Liaison

CERT and City of Walnut Creek
Challenges & opportunities for any digital alternative

- No Internet service or commercial power in any CERT field location.

- City IT security requirements do not allow connecting to their internal networks <u>OR</u> City Internet service. In addition, they don't want incoming CERT email traffic on their servers.

- Any digital design <u>cannot depend on Internet or cell access.</u>

- No clear sightlines for AREDN mesh, no Winlink RMS gateways in local area.

- Winlink is still the best solution that we've studied, but we'd need to be creative.

- **130+ WC CERT ham operators** are 95+% Technician level, with hand-held VHF/UHF radios.

- WC CERT is supported only by donations; grant(s) would be necessary for all funding.

Sample configuration for a stand-alone Winlink

8 CERT Command Posts
Public Works MDOC
Main & Alternate EOC sites
System Admin (Winlink)
CERT EOC Liaison & CERO - if mobile

Solar and battery power in field, turbine backup power at City Hall. No Internet, HF or repeaters are used; just simplex VHF @ 20 to 30 watts, using VARA FM Wide.

We don't have access to CMS; we use the local RMS Relay. And CERT reports only to their local EOC. (one step up in the ICS system)

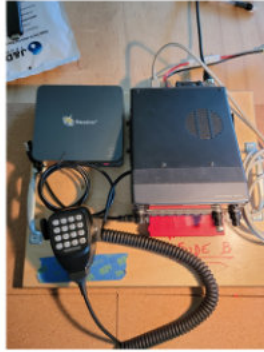## Simple VHF RMS/Gateway

Walnut Creek City Hall Stand-Alone RMS

Kenwood TMV-71 & power supply

Beelink Win 11 Pro "SEI8"mini-pc with 16GB memory, 500GB SSD. This unit autoboots on power restoration, logs itself into Windows and starts RMS Relay, RMS Packet, Soundmodem & VARA FM
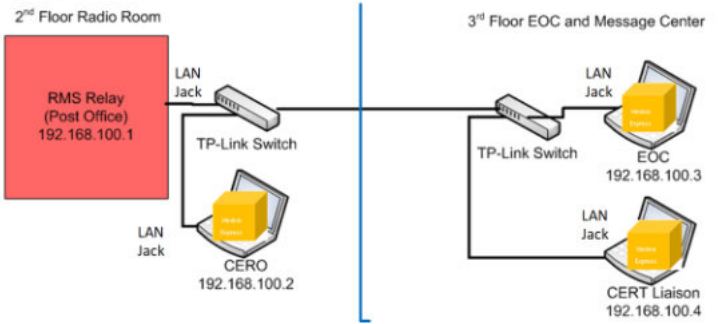
DRA50 card in red 3D printed box

HDMI Display when on site, HDMI dummy plug otherwise

Bluetooth keyboard/mouse when on site

Winlink – CERO / EOC internal Ethernet network

2nd Floor Radio Room

RMS Relay
(Post Office)
192.168.100.1

LAN Jack

TP-Link Switch

LAN Jack

CERO
192.168.100.2

3rd Floor EOC and Message Center

LAN Jack

EOC
192.168.100.3

TP-Link Switch

LAN Jack

CERT Liaison
192.168.100.4

Mobile SAR – GPS enabled Field Windshield Surveys

New Approach:

- Windows laptop with Winlink Express & GPS dongle
- Android cell phone/tablet with the WoAD (Winlink on Android) app, internal GPS

WoAD App on cell phone → Winlink Express → USB-connected GPS receiver

Strategic Reports via Winlink

Segregate Radio Traffic by Report Precedence

Present Method:

Analog radios (FRS, GMRS, Ham) SAR to Command Post
Manual paper messages and transcription
Manual mapping in Plans for all message categories

Tactical Reports by voice

Note: "Radiomail" app is now available for Apple devices, but it currently **does not** have Winlink message templates

We first looked at existing Winlink templates

Zulu (GMT) time?

But most of these items are not what the EOC asked us to report on... We COULD use this template by making manual changes to the date/time

So a CERT-specific template was created around our EOC's requirements. (This design came from the manual paper form that we use today)

Along with a new non-mapping Status Report to the EOC, done on-demand or at the end of an Operational Period.

These are for Routine category reports only.

This template could be GPS-enabled, allowing filter criteria and mapping if there is sufficient demand.

...and a CERT version of the iconic ICS 213, to be used for general communications between users and groups

Wireless survey transfers - Mobile to Command Post

Command Post Laptop

"Normal" Winlink session emails go to the closest RMS, then to CMS in traditional Winlink systems. Walnut Creek CERT goes to the City Hall RMS.

Telnet Winlink wireless sessions are used to/from the Mobile(s) to transfer the survey emails to a local copy of RMS Relay, serving as a Post Office.

Mobile arrives on site, connects to the 2.4G wireless access point, opens a Telnet Winlink session and presses their Start button. No coordination with Comms is required, and we're using Part 15 (non-ham) radio frequencies!

Messages stored in the local RMS Relay are automatically pulled into the Command Post Inbox for automated comms logs and incident mapping.

Incident Commander's Logical Question…

Great, you put 100+ new incident messages in my Inbox.

How are we going to log and read all that?

Comms first: creating the ICS-309 Radio Log

Plans next: automated mapping of received messages
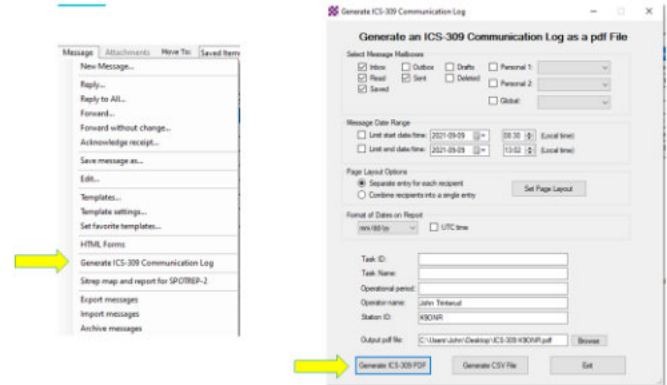
COMMUNICATIONS LOG		TASK #		DATE PREPARED: 03/23/23 TIME PREPARED: 13:18
OPERATIONAL PERIOD #			TASK NAME:	
RADIO OPERATOR NAME:			STATION I.D. K9ONR	
LOG				
TIME	FROM	TO	SUBJECT	
03/10/23 15:43	K9ONR	N6PRZ trint@att.net	CERT Windshield Survey: EMERGENCY, 2023-03-10 15:40:15, K9ONR, # K9ONR-005	
03/10/23 18:43	K9ONR	KG6SJT	FW: CERT Windshield Survey: PRIORITY, 2023-03-10 18:39:36, KK6BSN-13, # KK6BSN-1	
03/12/23 15:07	W2AFE	K9ONR	California Coastal Winlink Net - March 2023	
03/13/23 13:55	K9ONR	W2AFE	Re: California Coastal Winlink Net K9ONR	
03/16/23 10:07	K9ONR	KG6SJT	FW: Hawaii Siren Report - Monthly test, Did Not Hear Siren	
03/16/23 10:07	K9ONR	KG6SJT	FW: Hawaii Siren Report - Monthly test, Heard Siren	
03/16/23 13:02	KH6ML	K9ONR	//WL2K R/ Routine/ Field Situation Report 2023-03-16 19:59:30Z	
03/17/23 12:49	K9ONR	KK6BSN-13	CERO 38 EOC Report: from K9ONR, 2023/03/17, 12:47, Msg# 012	
03/17/23 13:02	K9ONR	KK6BSN-13	CERT Windshield Survey: PRIORITY, 2023-03-17 13:00:21, KK6BSN-13, # K9ONR-013	
03/17/23 13:40	K9ONR	KG6SJT	FW: CERT Windshield Survey: EMERGENCY, 2023-03-17 13:15:43, KK6BSN-13, # MOBILE-	
03/18/23 13:32	K9ONR	trint@att.net KK6BSN-13	CERT EOC Report: from K9ONR, 03/03/2023, 13:30, Msg# K9ONR-016	
03/20/23 13:45	K9ONR	KG6SJT	FW: CERT Windshield Survey: PRIORITY, 2023-03-17 13:00:21, KK6BSN-13, # K9ONR-013	

Generate a complete ICS-compliant radio log with the press of a button

QGIS and the Winlink/QGIS Interface

If you use the Field Situation Report template

Two simple text ("CSV") files drive the entire interface:

Winlink_Messages.csv
- **Automatically** created/updated as Field Situation Reports come in to the Liaison.
- Messages do NOT have to be read in order to update the csv file.
- Original emails remain in the Liaison's Inbox if required for additional reference.
- QGIS watches this file, places icons with colors and legends set by the message Precedence, at their reported GPS locations on a street map layer with physical addresses.

Resolved_Winlink_messages.csv (OPTIONAL)
- **Manually** created from the Winlink_Messages.csv file. (end of operational periods, or on EOC request)
- The CSV file is updated via a PowerShell routine written by Walter Chang of San Jose CERT and is specific to the fields in the Field Situation Report template.
- The CSV file is then manually edited by the Liaison to show specific incident(s) "RESOLVED", i.e. those no longer active.
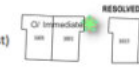
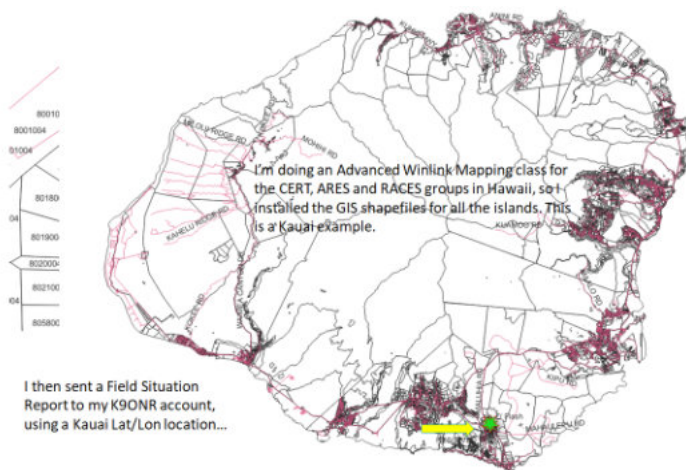| Message ID	From	Date-Time	Latitude	Longitude	12. Additional Comments	13. POC	Precedence	Task Number	Territory
L9UGSCTF5CK9	KK6BSN-13	1/31/2023 13:28	37.878168	-122.088334	Routine	KK6BSN-13 RM SAR 1	R/ Routine	RM SAR1	Rossmoor
T9664FUWD4AD	KK6BSN-13	1/31/2023 13:29	37.878169	-122.088335	Priority	K9ONR	P/ Priority	RM SAR1	Rossmoor
CMVJ/YDRB62B	KK6BSN-13	1/31/2023 13:31	37.87817	-122.088336	Immediate	KK6BSN-13 RM SAR 1	RESOLVED	RM SAR1	Rossmoor

- QGIS also watches this file, overlays a green icon over the original incident icon and displays "Resolved".

If you use the CERT Windshield Survey template

One simple text ("CSV") file drives the entire interface:

CERT Survey Messages.csv
- **Automatically** created/updated as Windshield Survey Reports come in to the Liaison (or any other Winlink account)
- Messages do NOT have to be read in order to update the csv file.
- Original emails remain in the Liaison's Inbox if required for additional reference.
- QGIS watches this file, places icons with colors and labels set by the message Precedence and your associated text comments, at their reported GPS locations on a street map layer with physical addresses.

3/21/2023 16:45 Flooding Entry 10

3/22/2023 9:35 tree fell across entrance to Entry 10

I'm doing an Advanced Winlink Mapping class for the CERT, ARES and RACES groups in Hawaii, so I installed the GIS shapefiles for all the islands. This is a Kauai example.

I then sent a Field Situation Report to my K9ONR account, using a Kauai Lat/Lon location...
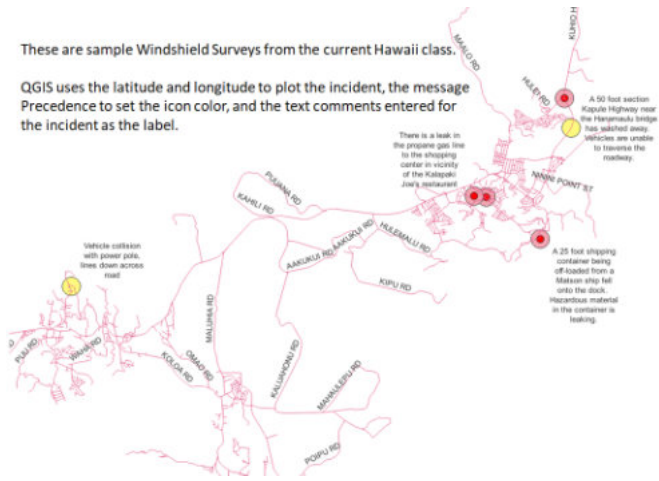
Winlink internal map(s) of the Kauai

ARCGIS Streets map

Bing Hybrid map

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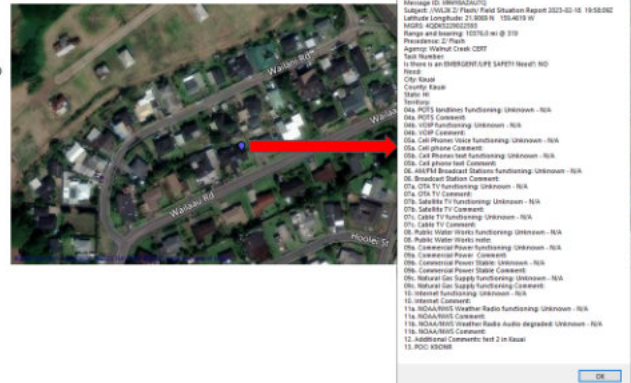
These are sample Windshield Surveys from the current Hawaii class.

QGIS uses the latitude and longitude to plot the incident, the message Precedence to set the icon color, and the text comments entered for the incident as the label.

Automated filtering and mapping + QGIS summary

Automatically map CERT (and other) incidents by precise GPS coordinates and color-coded message precedence, without Internet or cell service, using free software.

A wide choice of maps are available within RMS Express, but you will need Internet access to initially download and store them. Once downloaded, all maps are cached and no longer require the Internet to display incidents.

A varied mix of field information can be filtered for display, including searching text comments within fields, arithmetic calculations and true/false evaluations.

Every Winlink message has automatic traceability and positive proof of delivery to the recipient.

And the QGIS layers are directly compatible with your agency's ARCGIS files!

Summary and Numerous Paths Forward

This presentation covered some of the capabilities of the Winlink system with special emphasis on CERT's unique communications and reporting needs, but not how your individual CERT organization(s) could/should/might deploy them. The Winlink suite of programs are free to licensed amateur radio operators; QGIS is free to everyone.

All of the incident report filtering and mapping capabilities demonstrated (and many more) are available to you now for use within Winlink, as are the three custom CERT message templates; CERT Windshield Survey, CERT EOC Status Update and CERT213.

Download the templates from: www.Winlink.org/content/cert

Based on demand, a Winlink Basics presentation with specific configuration instructions will be made available.

An eight-session advanced Winlink class concentrating on the message filtering, mapping and display techniques shown in this presentation is now available. This is a free, two-month duration class delivered weekly by email; if you are interested, please contact Joe Speroni AH0A@ARRL.net (AHZeroA). We are accepting students in groups of ten and you will be working together (remotely) on several of the sessions.

Lastly, we welcome new ideas for all CERT Winlink implementations; please send them to K9ONR@ARRL.net and let's continue the discussion!

Hawaii CERT Winlink Mapping Specialist – Session Topics

Session Number	Topic
Session 1 (Hardware purchase)	GPS unit recommendations, RMS Express GPS setup and configuration, send Position Report to CMS
Session 2	Add Tactical Callsigns, download and install GIS-enabled CERT message templates, initial Telnet testing
Session 3	Simulated CERT Field Survey, downloading and caching maps at recipient end (simulated command post), mapping demo of your GPS messages to introduce Session 4.
Session 4	Incident filtering & mapping results in RMS Express
Session 5	Map export techniques in multiple formats
Session 6 (Hardware purchase)	Simulated Command Post setup with RMS Express, RMS Relay and re-flashed Wireless Access Point, live testing.
Session 7	WoAD and RadioMail apps, configuration for Field Surveys and wireless transfers to command post.
Session 8 (optional)	QGIS interface for EOC, import County shapefiles and basic add delimited text layer settings for Winlink csv files

Roll the credits

Winlink design specifics, customizations, template assistance
- Thomas Noel, KF7RSF, Winlink Development Team, User Support
- Oliver Dully, K6OLI, Winlink Development Team, ARES LAX Northeast
- Greg Kruckewitt, KG6SJT, Winlink Development Team, Message Templates
- Phil Sherrod, W4PHS, Winlink Development Team, Programming Lead
- John Trinterud, K9ONR, ARRL East Bay Section, Technical Specialist, CERT Winlink Project design

Walnut Creek CERT
- Don Prosnitz, N6PRZ, CERT Liaison, Winlink Project Lead, QGIS resource
- Margaret Campos, AJ6LP, CERT Liaison, Walnut Creek CERT Coordinator
- Mark Peters, KM6GNS, Winlink Project Logistics & Acquisitions

City of Walnut Creek
- Ray Lam, KK6VCX, CIO & IT Director

San Jose CERT
- Walter Chang, AG6FK, Almaden Valley & SJN CERT, SCCo ARES/RACES
  Custom PowerShell for the QGIS interface "RESOLVED" incidents file

ARRL
- Joseph Speroni, AH0A, ARRL Pacific Section (PACSEC), ARRL Section Manager
- Mike Patterson, N6JGA, ARRL East Bay Section Manager, Walnut Creek CERT Winlink Documentarian

Hawaii CERT/ARES/RACES members on all the islands
- The sixteen members of the inaugural Hawaii CERT Winlink Mapping Specialist class

Thanks to these great organizations!

2023 Devil Mountain Run Thank You and Report

The Devil Mountain Run was held on Sunday, May 7th, 2023, in downtown Danville. The runners for 5K and 10K groups started at

Railroad and School and finished at the designated finish lines (both locations were covered by volunteer radio operators).

The races went around and

through downtown Danville. There were other races as well involving dogs and children. The total numbers of runners for all groups were over 1,000+. The total number of hams that volunteered for this event was 20 radio volunteers and they did a

very professional job. We used two (2) APRS trackers from LARK to follow the Bike Sweeps for both races. All major areas and intersections of concern for the race were covered for safety for the entire event. There was one moderate injury and aid and transport was provided by San Ramon Valley Fire District.

Net Control operations were performed in the San Ramon

Valley Fire Protection District Communications Support Unit CS-131 with volunteer staffing from

fire Communications Reserves (who are volunteer radio operators also) performing as Net Control operators. I want to thank the following LARK and other ham volunteers for helping today:

Peter AI6RG, Bernie NJ6W, Alan KM6BRQ, Mark KK6UKU, Bill N6SGT, Mike W6KX, David K6WOO, Bill AJ6UU, James N6JRQ, Ryan W6RAM, Steve WB6SAI, Lowell KA6LER, Darrel K6DRL, Daniel KB6FF, Clancy N6FQQ, Barbara K6WHY, Steve K8YIP, Rand W6TRM, Simon KM6NSV, AJ Lafferty, Chris Eckenrode, and Chris W6CJQ.

Thanks for putting up with the last-minute assignment changes and for your help for this very worthwhile public event.

George KG6GEM

Devil Mountain Double Century: John WB6ETY

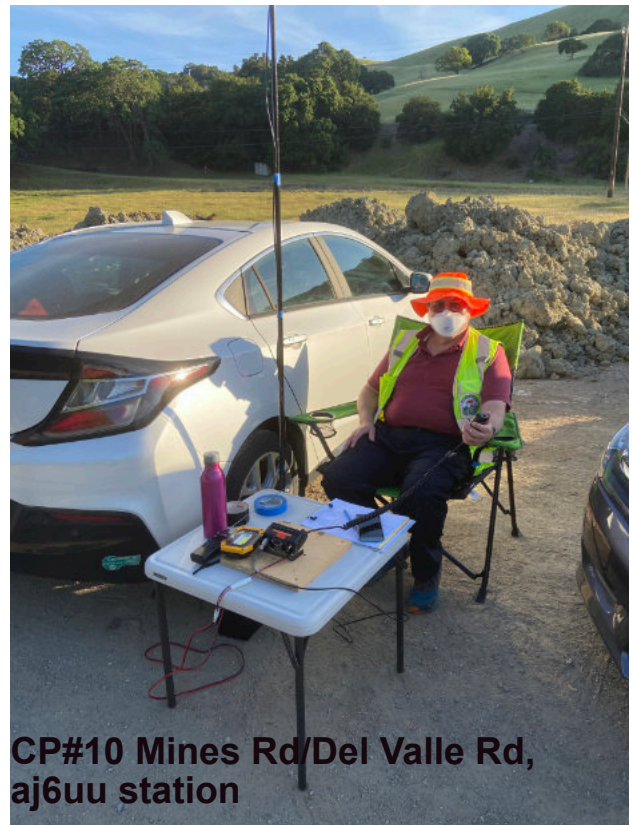**2023 Devil Mountain Double Century (DMD) 200 mile, one day ride on 4/29/23**

CP#5, Sunol Corners, serving riders

CP#8 Mines Rd/Del Valle Rd, ad6rh station

DMD Background:
 Like many things, the DMD has seen a lot of changes lately. The 2019 DMD was the last of the "traditional" DMDs, and even then its route was modified. COVID canceled the 2020 and
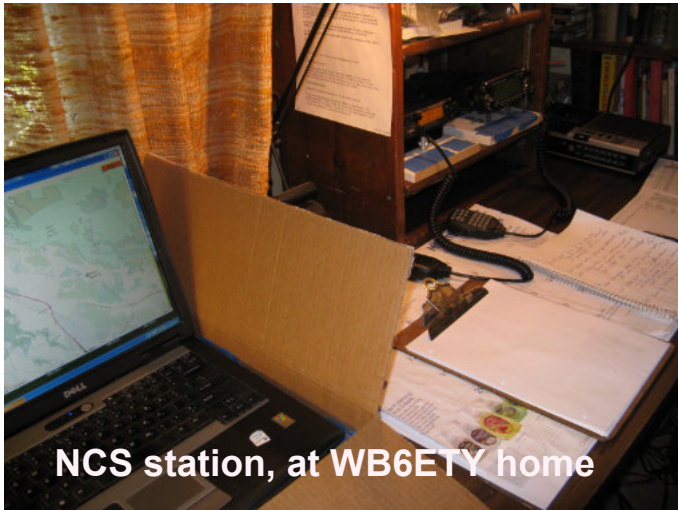

CP#10 Mines Rd/Del Valle Rd, aj6uu station

2021 DMDs. The 2022 DMD was limited to 50 riders and had a new streamlined support format. For 2023, the DMD lost its long time ride director, so now has a new ride director, a new supporting bicycle club, a

new start/finish in San Jose, a new route, and for the second consecutive year, a new support format.

NCS station, at WB6ETY home

The 2023 DMD:
Most significantly, the new ride director and his bicycle club are located in San Jose, and so wanted a San Jose start/finish location. Unfortunately the traditional loop route is not compatible with a San Jose start/finish. So the new route

NCS antennas, at WB6ETY home

contains two parts; first a 46 mile "out and back" to the Mt. Hamilton summit, and then a 159 mile ride to Sunol, Mt Diablo summit, Concord, Morgan Territory, Livermore, 10 miles south on Mines Rd, a U-turn, back to Livermore, back to Sunol, and then on Calaveras Rd back to the San Jose start/finish location! See the included route map.
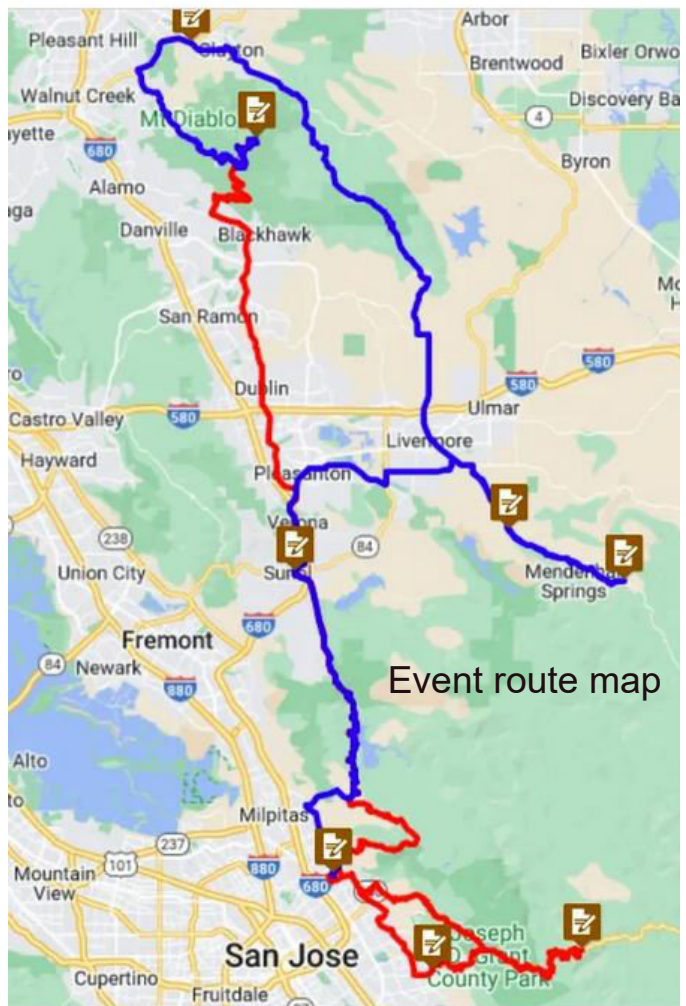
Event route map

42 riders started, 7 dropped out, so 35 finished the entire 205 mile ride. No injuries were reported.

See the DMD website for a description of the event and many photos taken during the event: https://devilmountaindouble.godaddysites.com/

LARK Support of the 2023 DMD:
The two part route made for easier LARK support this year. The ride director was comfortable using cell phones to support the "out and back" to the Mt. Hamilton summit, and did not want amateur radio support for that early part of the ride.

So LARK only needed to support the "Sunol to Sunol" part of the ride, allowing us to start at 0900 hours instead of at the 0300 hour start for the ride to Mt. Hamilton! The last rider reached Sunol on the way home at 0030 hours (Sunday morning), but our radio support stopped at 2330 hours as that last rider had a Sweep vehicle following him.

LARK supported 7 Control Points (aka rest stops). They were: CP#5 - Sunol (outbound), CP#6-Mt. Diablo summit, CP#7-Concord, CP38-Mines Rd/Del Valle Rd (outbound), CP#9-Mines Rd U-turn, CP#10-Mines Rd/Del Valle Rd (inbound), and CP#11-Sunol (inbound). A main CP operator task was sending and receiving DNS and DNF (did-not-start and did-not-finish) rider number updates to/from the NCS (net control station). CP operators were kept up-to-date on SAG vehicle positions by the NCS. CP operators often assisted the CP bike club workers with the rider check-in process. Some CP operators installed LARK APRS trackers in SAG vehicles, other CP operators removed LARK APRS trackers from SAG vehicles.

We used four repeaters to cover the huge route; W6SRR-Sunol Ridge, W6CX-Mt. Diablo, WA6ODP-Morgan Territory, and AD6KV-Pleasanton.

We installed (and removed) three LARK APRS trackers in three SAG vehicles.

We used APRS messaging to support CP#11-Sunol (inbound). The included log of this APRS messaging shows how useful it can be.

With no particular place to be, Net Control began at WB6ETY's QTH, switched to KC6JHF's QTH, and then finished at WB6ETY's QTH.
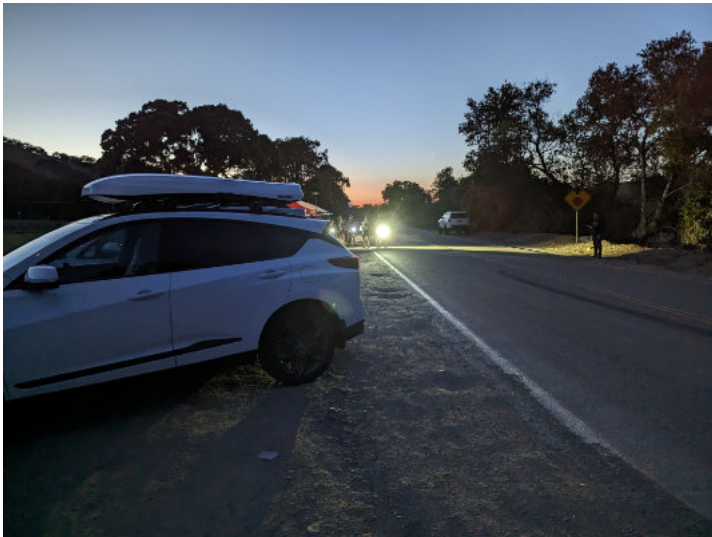
Some things to strive for next year:
Improve the rider check-in process at each Control Point. This process can get crazy at times and seems to always need improvement!
Use APRS messaging at more Control Points as it was very useful at CP#11 this year.

Thanks to all the LARK volunteers:

CP#5, Sunol (outbound):
KC6JHF, Keith
CP#6, Mt. Diablo summit:
K6SGD, Mike
CP#7, Concord "Circle K":
KI6LNB, Larry
CP#8, Mines Rd/Del Valle Rd (outbound): AD6RH, Jeff
CP#9, Mines Rd U-turn (at mile marker 10): KK6UKU, Mark
CP#10, Mines Rd/Del Valle Rd (inbound): AJ6UU, Bill
CP#11, Sunol (inbound):
N6SGT, Bill
NCS (at home QTH):
KC6JHF, Keith
NCS (at home QTH):
WB6ETY, John

The log of APRS messaging between the NCS and CP#11

19:57:52 New Chat Between N6SGT-1 and WB6ETY-1 on 2023-04-29

19:35:03> testing to check if aprsis32 is working (*2-19:35:04)

19:35:29> i believe you should be getting acks now (*3-19:35:38)

19:35:33< AA:AutoReply: I'm away fm this PC right now.

19:49:05> do you show sag3 as moving? (*6-19:49:38)

19:58:20< OK, I didn't notice new n6sgt-1 msgs

19:58:32< And yes, I'm getting an ack now

19:59:02< SAG3 is not moving. He is CP#9 and will only move after CP#9+

    < closes

19:59:04> good. I will continue to monitor both. (*4-20:00:11)

19:59:26> copy that about sag3. makes sense. thx (*6-20:00:31)

20:00:19> copy about bike pump (*4-20:01:28)

20:00:43> this is getting way too high tech (*4-20:01:27)

20:01:03> radio, regular email, aprs messaging, cell (*5-20:02:09)

20:01:05> LOL (*7-20:01:40)

20:08:03< Agreed, but this aprs messaging is working the best of any of them+

    < I think. And working "acks" are great.

20:08:04> AA:Please stand by, away from computer at the moment. (*4-20:08:12)

20:10:04> yes, they are. (*6-20:11:10)

20:10:29> are you going to be looking for dnf's (*5-20:11:02)

20:10:33> no shows (*5-20:11:41)

20:10:45> or everyone? (*6-20:11:19)

20:18:29< I want DNFs and "no shows". All the other numbers should have+

    < then been checked in as continuing. Everyone is too big a group!

20:18:53> got it. thx (*5-20:18:58)

20:19:06< CP#8 just said he "thinks" all riders have passed CP8, now waiting+

    < for them to return down the hill

20:19:56> copy that. I was just looking at the times for the checkpoints (*3-20:20:02)

21:22:01> 19 checked in at control 11 so far plus the one drop (#37) (*8-21:23:12)

21:22:31< AA:AutoReply: I'm away fm this PC right now. (*2-21:22:31)

21:22:51> by our count another 18 to go unless there are drops I don't know+ (*6-21:24:00)

21:22:52> about (*5-21:24:01)

21:47:04< I talked to ride director. He will tell #36, he is too late and+

    < on his own. He says Sunol will close at 1100PM, but is calling+

    < Sunol dmd staff person now. So should be more info after they+

    < talk.

21:47:05> AA:Please stand by, away from computer at the moment. (*4-21:47:20)

21:50:57> ok (*5-21:52:03)

21:53:25> fyi, radio reception very poor on HT (*5-21:54:07)

21:53:48> monitoring both ad6dv and w6srr (*9-21:54:56)

21:55:29> mobile working fine (*4-21:56:34)

21:56:35< Yes, I know about ad6kv less than perfectness. But worth it to+

    < keep everyone on same repeater.

21:56:54< We can switch to w6srr now. No one else to talk to.

21:57:10< Give me a call on w6srr for a test.

22:05:40> i tried on both repeaters, but no response (*5-22:06:46)

22:07:18< I hear you fine on ad6kv, but no reply fm you. I did not hear you+

    < on w6srr. I'll call you now there.

22:10:22< I'm keying up w6srr calling you - no reply heard

22:10:40> i am hearing you on srr (*6-22:11:46)

22:11:31< OK, i'm not hearing you

23:36:29> final message,, good night (*7-23:37:18)

23:36:59< AA:AutoReply: I'm away fm this PC right now. (*2-23:36:59)

23:40:48< 73 Bill, John (*4-23:41:21)

International DX Convention - Visalia 2023   Roberto K6KM

The 74th International DX Convention was held at the Convention Center in Visalia, California, April 21-23. https://www.dxconvention.com/index.html

It is organized by the NCDXC (Northern California DX Club) and with cooperation this year from CADXA: Central Arizona DX Association.

The first in-person IDXC since 2019. It was attended by almost 500 people. Yours truly was one of them representing LARK, NCCC and NCDXC.

I volunteered this year at the registration booth which was a great opportunity to meet people I only knew by zoom or via the radio. Eyeball QSOs as they call them.

A highlight was seeing Adrian KO8SCA again and David WD5COV, both Bouvet activators. I met Adrian back at Contest University in Dayton last year.

Friday, there were two focused tracks. The DX University and Contest Academy. Both gave many insights on how to work needed entities for DX

or how to improve your contesting skills. There were presentations in all levels so everybody could get a piece of valuable information.

Friday after the meetings, the attitude adjustment time was a great opportunity to meet people in a relaxed venue at the courtyard. DX Engineering generously provided

some free drinks for the audience.

Saturday was focused on presentations and two important forums. One on DX and one on contesting.

The Bouvet expedition was particularly affected by DQRM (deliberate QRM). Many ideas were discussed on how to cope with these issues. Pirates were also a nuisance

and one that might be solvable by adding some hooks to WSJT-x.

As usual, DXPeditioners met to discuss their future plans for

adventure.

The RIB (Radio in a box) was on display. The project was funded by the DX Foundation in order to try to satisfy some of the governmental requirements while soliciting permission to operate in protected areas. The idea was to bring the radio on shore, setup the antenna system,
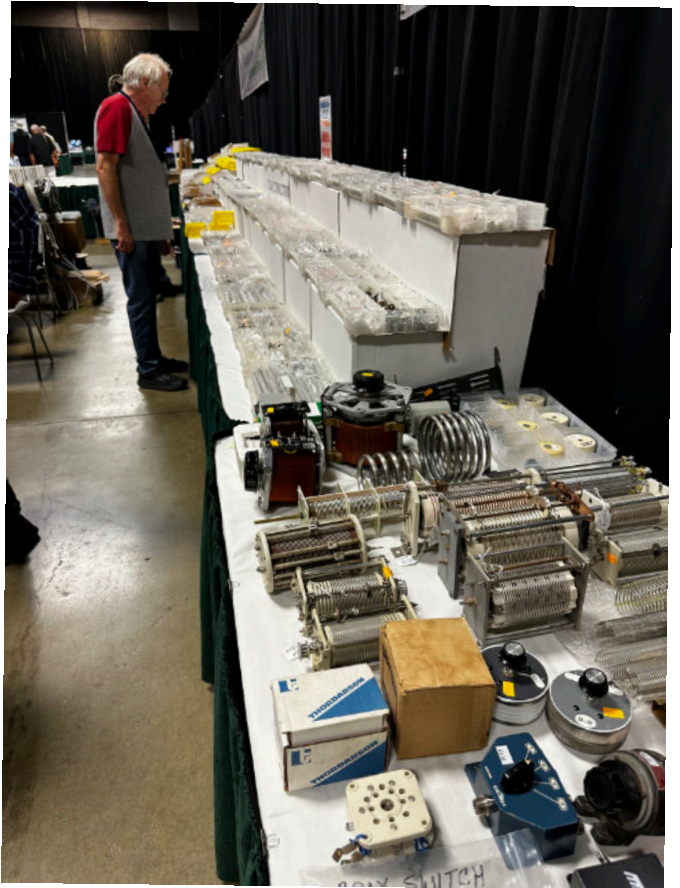
fire up the generator and return to the ship where operators can do their job in a nice setup away from wildlife, extreme temperatures and also while minimizing the footprint on the island. Frequent visits would still be needed to replenish generators or fix damaged antennas.

Vendors were available and showcasing their latest products.

Raffle tickets were in high demand as Elecraft donated a K4D as the first prize. There were more rigs in the raffle, several IC7610, IC7300 and a Flex.

Lots of hourly prizes also. Some visitors went all out buying several thousand dollars of tickets.

Saturday night was the banquet where NCDXC recognized their major contributors, SK were remembered

and finally, the 3 visitors from the Bouvet DXPedition could narrate their adventure to the most remote uninhabited island on earth.

Listening to their stories was enlightening and entertaining (at least to the audience). We might not see another DXPedition there for awhile.

One highlight was the fact that they did not spend all the money received from the foundations so they are giving $40k back to the NCDXF so the money can be used for other upcoming DXPeditions.

To me it was a very rewarding convention. Learned a few things and met a lot of interesting people. Of course, it would have been the best convention if I came back with the K4D but didn't happen.

Roberto

K6KM

A SOTA Double-First   Gary NA6O

I've been a SOTA chaser for quite about 10 years, achieving the somewhat demeaning status of Shack Sloth. But oh, to be an activator, perched high on those windy peaks with a tiny radio kit. Thanks to Roberto, K6KM, I now have exactly one point toward becoming a SOTA Goat. That's 0.1% of the way, only 999 points to go. So that's the first First in this story. How did we do it?

Some of you are familiar with the K6LRG station up on top of Patterson Pass. The rolling hills of the surrounding ranch property contains a SOTA peak identified as W6/NC-249 and it has never been activated, making that our second First in this story. It's all privately
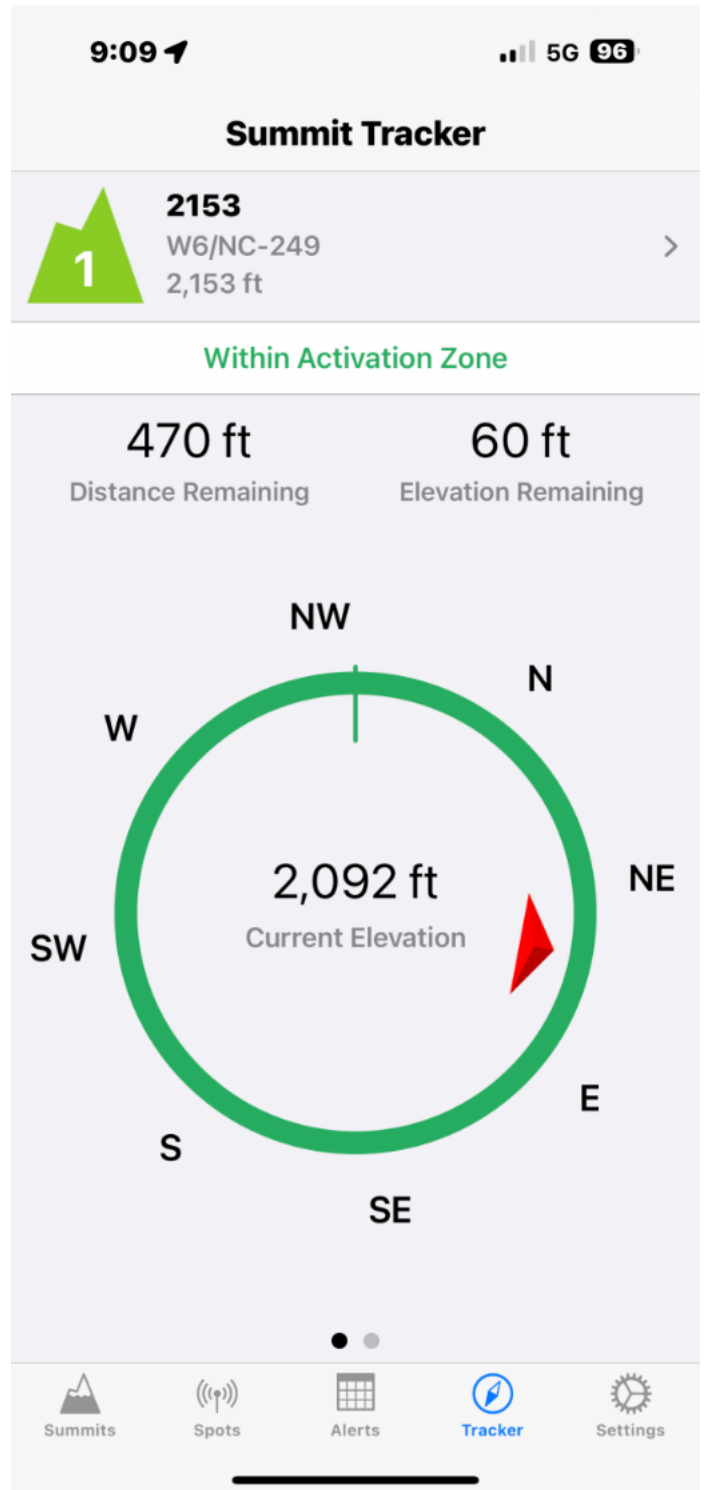
activations can produce. This was a bit like car camping, complete with comfortable folding chairs tucked in behind the car and out of the blasting wind.

Roberto kicked it off on 15m CW with about ten contacts, then I took over and operated on 40, 20, 15, and 10m CW with a total of 18 QSOs. My best DX was West Virginia. I also scored two summit-to-summit QSOs (AZ and ID), which is pretty cool if you think about it, two stations with QRP rigs hundreds of miles apart. Overall it

owned/no trespassing but we are friends with the owner, and he gave us permission to visit. So on Sunday April 30, 2023, Roberto and I set out in my Jeep to do a little off-roading. After a few gates and some bumpy winding ranch roads, we made to the activation zone, just down from the peak itself and quickly set up shop with his KX2 and a random wire supported by a fishing pole lashed to the fence. His radio kit is simple but very nice and shows what experience from 200+

was a lovely day out with a good friend, while scoring a Double First . Ham radio doesn't get much better than that.

Gary
NA6O

Worked All Argentina Award: Rob K6KM

If you remember well, last year I completed all Brazil. It was a struggle to get the last few States.

This year I set up to finish Argentina. If you have been in the air for a while, you might think that working Argentina is easy, and it is. We enjoy trans-equatorial

República Argentina

RADIO CLUB ARGENTINO

TODA LA REPÚBLICA ARGENTINA

Roberto Sadkowski, K6KM

Se le otorga el presente certificado, en reconocimiento por haber realizado contactos bilaterales con estaciones de radioaficionado ubicadas en las 24 divisiones políticas argentinas, de acuerdo con los requisitos establecidos en las bases generales, en modo **Mixto**.

Buenos Aires, 10 de abril de 2023

Nº 1579

Diego Salomi LU8ADX
Award Manager

Juan I Recabeitia, LU8ARI
Presidente

propagation to the southern hemisphere. That is not the problem. The issue is usually that certain states in any Country (think of Delaware for US) are not overly populated with Hams and you still have to get a confirmation of your QSO. Not everybody uses LOTW and not everybody exchanges cards.

So, making the contacts is one thing, getting confirmation is a much bigger thing.

At some point I was confused and thought I needed to get a contact with the Argentinian Antarctic station since it has its own prefix. This Station is seldom in the air. Well… suddenly it popped up on SSB with an incredibly deep pile-up. Of course, the locals were significantly louder than me so after an hour of trying on SSB I gave up.

Suddenly I received a spot that they started on another frequency which

N°	DIVISIÓN POLÍTICA	SUFIJO	N°	DIVISIÓN POLÍTICA	SUFIJO
1.	Buenos Aires	LU-LW#D/E	13.	Misiones	LU#I
2.	Catamarca	LU#R	14.	Neuquén	LU#Y
3.	Chaco	LU#GA-GO	15.	Río Negro	LU#V
4.	Chubut	LU#W	16.	Salta	LU#O
5.	Córdoba	LU-LW#H	17.	San Juan	LU#P
6.	Corrientes	LU#L	18.	San Luis	LU#Q
7.	Entre Ríos	LU#J	19.	Santa Cruz	LU#XA-XO
8.	Formosa	LU#GP-GZ	20.	Santa Fe	LU#F
9.	Jujuy	LU#T	21.	Santiago del Estero	LU#N
10.	La Pampa	LU#U	22.	Tierra del Fuego, Antártida e Islas del Atlántico Sur	LU#XP-XZ/LU#Z
11.	La Rioja	LU#S	23.	Tucumán	LU#K
12.	Mendoza	LU#M	24.	Ciudad Autónoma de Buenos Aires	LU#A/B/C

provided a better path to W6. I tuned and he was there calling CQ simplex. I made the QSO and chatted 30 seconds with the operator. One minute later the pile-up formed and it was wide like before. Got QSL confirmation next day and learned I didn't need it for this award. For the last two States, Bob K3EST has a lot of experience chasing IOTA and is one of the two US operators to complete some of the most difficult awards in JA for DX Stations. Bob worked with me to find out who was in the air in those last few States. For one of them, Bob could not find anybody but found a very active Ham in a neighboring State. I set to contact that Ham and after an email chat he pointed me to who might be active and operating there. After a sked (and the operator fixing his 10m dipole) we made the last QSO. Then verifying, then applying for the Award and then waiting for a month to receive it.

What's next, people ask. I'll have to think about it. JA is a 3-5AM endeavor that doesn't bode well with me and my family.

I want to thank Ian W6TCP and Gary NA6O for letting me use their fine remote station W6SRR and Bob K3EST for cheering me up and helping me find activity where it seemed to be none.

Roberto K6KM

Map of Licensed Hams Tony KF6JS

Did you know you find all the licensed Hams in your area by simply typing your call sign in this mapping link?

https://haminfo.tetranz.com/map/KF6JS

Amateur Radio License Map

Use this map to find amateur radio license holders in the USA. Click here for more info.

- Select the type of input (callsign, gridsquare, zip code or street address) on the left.
- Enter an appropriate search value on the right.
- Hit the button.
- Scroll down see the map.

The selection determines the center of the map.

When the map appears, you can adjust the zoom level and drag the map around. If you're looking at a sparsely populated area, you'll probably need to zoom out.

After two seconds of not moving, it will reload with stations for the new area. You can also click on the gridsquare labels to center tha map on that square. Use the "Show grid labels" checkbox to temporarily remove the gridsquare lines and labels if they get in the way.

Click on a marker to see name and address info.

- ● Callsign
- ○ Gridsquare
- ○ Zip code
- ○ Street address

Callsign

KF6JS

Enter a callsign.

Show the map

☑ Show grid labels
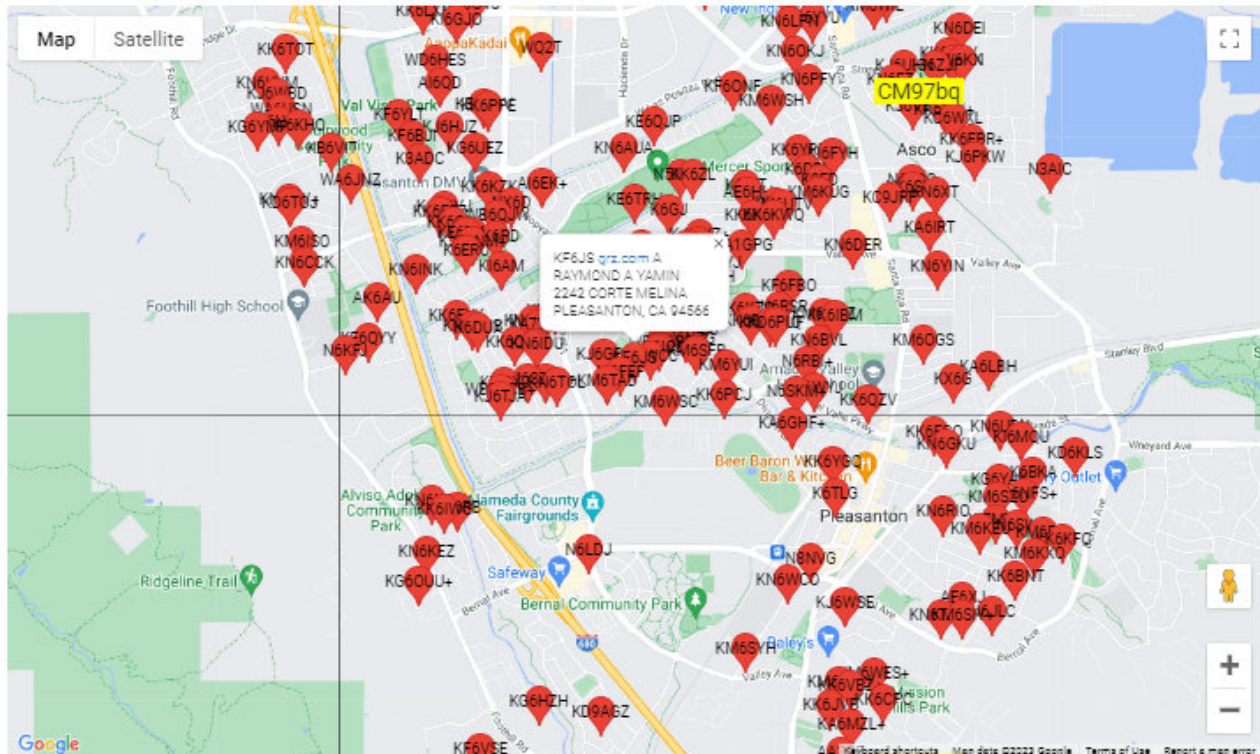
June 2023

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

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

April

DAY	OP	NAME
03	WB6ETY	John
10	EOC	
17	WB6AEA	Jon
24	AD6KV	Ron

May

DAY	OP	NAME
1	AE6D	Ed
08	EOC	
15	WB6ETY	John
22	WB6AEA	Jon
29	AD6KV	Ron

June

DAY	OP	NAME
5	AE6D	Ed
12	EOC	
19	WB6ETY	John
26	WB6AEA	Jon

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
4/6/2023	Thursday	Brian/KA6ZED	Peter/AI6RG	Study Night: General Exam
4/13/2023	Thursday	Peter/AI6RG	Brian/KA6ZED	Easy Tech Discussion:
4/20/2023	Thursday	Rich/KN6HSR	Nate/N8MOR	General Discussion:
4/27/2023	Thursday	Nate/N8MOR	Rich/KN6HSR	Advanced Tech Discussion
5/4/2023	Thursday	Bill/AJ6UU	Nate/N8MOR	New Comer, General Discussion:
5/11/2023	Thursday	Noah/AJ6XK	Bill/AJ6UU	Study Night: General Exam
5/18/2023	Thursday	Nate/N8MOR	Noah/AJ6XK	Easy Tech Discussion:
5/25/2023	Thursday	Brian/KA6ZED	Peter/AI6RG	General Discussion
6/1/2023	Thursday		Brian/KA6ZED	Advanced Tech Discussion
6/8/2023	Thursday	Rich/KN6HSR	Nate/N8MOR	New Comer, General Discussion:
6/15/2023	Thursday	David/K6WOO	Rich/KN6HSR	Study Night: General Exam
6/22/2023	Thursday	Bill/AJ6UU	David/K6WOO	Easy Tech Discussion:
6/29/2023	Thursday	Noah/AJ6XK	Bill/AJ6UU	General Discussion:

Regularly Scheduled Nets

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.

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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	
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Swap n Shop	Richard Combs	KN6HSR	KN6HSR@arrl.net	
Ask the Elmer	Lee Zalaznik	KI6OY	Lee.zalaznik@sbcglobal.net	(925)-699-5998

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=a0xt0000000mAuzAAE

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.
<u>Circle all that apply</u>: 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.
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. **Thank you and welcome aboard from LARK and the Membership Team.**

22-Feb-22