



# FIELD DAY NEWS



| JULY-AUGUST 2021 | [Mountain Top Amateur Radio Association](http://www.mtaara.org) |

**President: Vic Marquez, KK6WKI**

**Secretary: Dave Esquer, K6WDE**

**Ed/Membership: Tracy Lenocker, WM6T**

The Rim of the World ARES group is an ARRL affiliated organization and part of the Mountain Top Amateur Radio Association.

**Vice President: Gary Johnson, AA6GJ**

**Treasurer: Patty Szychowski, KK6LWH**

**Past President: John Snedden, KT7P**

## President Vic's Message

**G**reetings from your President, Vic, KK6WKI.

I want to thank everyone who volunteered to make this year's Field Day a great success. Those of you who helped set up on Friday with both events, Field Day and also with our sale and free items. Those of you who worked your event stations, those who prepared meals and those that helped break down and clean up. THANK YOU ALL VERY MUCH!

We had 51 members attend and 2 guests for a total of 53 at our Field Day.

We had several stations set up for members to experience all aspects of ham radio.

- ▶ **Learn to Solder:** We learned about Safety, cutting and stripping wire. We also learned about what makes a good soldering connection.
- ▶ **Morse Code:** We learned to send our name and much more.
- ▶ **Electronics:** We learned about electric circuits by making one with switches, LED's or other parts. This was a chance to help

understand parallel, series and other questions from the Technician Test pool.

- ▶ **Mobile Operations:** We had a Jeep set up for running mobile operations and demonstrating FT8 in a tent ham shack.
- ▶ **Low Power Radios (QRP) and Loop Antennas:** QPR radios with 5 watts CW or digital and 10 watts on SSB are fun. We learned about making contacts in difficult conditions. The magnetic loop antenna was easy to set up.
- ▶ **APRS/Search and Rescue:** Automatic Packet Reporting System or APRS is a system that receives packet information from a transmitter. The most common use is for mapping where the transmitted packet contains information from a GPS receiver connected to the radio. Other information might include weather, speed, elevation and battery condition.
- ▶ **Mobile Radio System, VHF/UHF:** with this radio a licensed radio operator can talk to other licensed individuals many miles away who might be driving or sitting at home.

Raffle Prizes: We had some great

raffle prizes.

## JULY IN-PERSON CLUB MEETING

For those of you that made it to our In-Person club meeting, it was was great seeing you and I got to see a few new faces.

The meeting was held at the Masonic Lodge in Twin Peaks. Other than the location, it was just as I remembered. We had our welcome table set up and you were given a raffle ticket when you checked-in. The thing I remembered most of our past in person meetings, was KK6LWW, Paula's wonderful homemade snacks and they were just as good as I remembered.

Bob Turner, the new Orange section manager for ARRL was introduced. He made welcoming remarks and stated that he was looking forward to working with us in his new position.

We had all our members and guests introduce themselves, we had 43 members and 2 guests show up. Each person gave their Call Sign, where they were from and shared a little of their background, as well as how they had become members of our club.

We usually have a FREE table set

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up in the back of the room with free ham related items, as well as items for sale.

The evening's presentation was a demonstration about setting up a Dipole. Tracy, WM6T, assisted by Gary, AA6GJ and Nancy, KK6LWP, explained how to set up a 20m dipole using an antenna analyzer.

Remember our upcoming club events where we provide communications: Tour de Big Bear, The Kodiak 100 and the Grand Fondo.

All for now. Stay radio-active and as always, **if you see something, say something!**

73, Vic

## Monthly Club Meetings

Our monthly meetings are on the first Tuesday of each month. **August 3 is the next meeting, remember we are now at the Masonic Lodge in Twin Peaks.** The address is 26012 Highway 189, Twin Peaks, CA. 92391 adjacent to the Sheriff's Station. The meetings begin at 7:00 p.m. and last until about 9:00 p.m. Our meetings are open to everyone, licensed amateur radio operators or just interested parties. Our purpose is to provide educational opportunities, mentoring, radio communication training and radio communications for community events.

See you soon!

## Treasurer's Report - KK6LWH

Our opening June 1 balance was \$10,385.99 with \$550.00 in deposits and expenses of \$1864.59 for the month. The total funds on deposit in our account is now \$9,021.40 as of July 6.

73, Patty

## Online Zoom tech meetings

Our Zoom meetings are on THURSDAYS at 2:00 p.m. Check out the MTARA Website home page for a listing of what each of the presentations will be about. If you need help setting up Zoom on your laptop or smart phone please contact Tracy, WM6T, who will help you get set up and running.

## U.S. Naval Sea Cadets and Ham Radio - WA6MTN

During the week of July 11-17, Lt. Commander Gene Anastasi, KJ6LMP, and a dedicated group of 8 high school sea cadets from all over the U.S. gathered at St. Anne's in the Mountains on a

week-long STEM hands-on program. Some of you may remember last year's program where the summer program concentrated on underwater robotics, complete with live demonstrations at the Smiley Park swimming pool.

As an introduction and exposure to other technologies, MTARA members Greg, AJ6FN and Dave, K6WDE setup a ham radio HF station on Thursday, July 15 at the Church. The focus was getting the students 'on-the-air' making real-world contacts. Thankful for the great propagation on 20, 40 and 6 meters, the 8 students managed 34 contacts. With support of our local ham friends, the Sea Cadets made contacts from Hawaii to Chile to Spain and all points in between. As a fallout and final de-brief with the Lt. Commander, three of the eight cadets expressed interest in beginning their ham radio licensing journey! **Our ham radio future is bright, thank you, Gene!**



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## *BASIC Tools for the Construction and Repair Bench - AJ6FN*

This is a very tricky topic because different construction projects will require different tools. However, I will attempt to look at the basic tools that I use for most projects. As a reader, you may be quick to point out tools I left off of the list but remember, this is a basic list which should be regarded as a starting point for ham radio construction projects. As your needs change, your toolbox will grow.

You will probably find uses for the following basic hand tools in building many available kits or to home brew your own projects.

- ▶ Jeweler's screwdriver set
- ▶ Two sizes of Phillips and straight blade (common) screwdrivers – small and medium
- ▶ Diagonal cutters – 6 inch and a smaller pair
- ▶ Needle nose pliers – 6 inch and a smaller pair such as those used for jewelry making
- ▶ Socket or nut driver set
- ▶ Drill bit set (also include a set of 2 or three step bits)
- ▶ Exacto type hobby knife
- ▶ Allen wrench set (hex wrenches)
- ▶ File assortment (rat-tail, square, triangle, flat)
- ▶ Hacksaw
- ▶ Clear plastic Ruler (SAE/metric)
- ▶ Emery cloth – various fine to medium grits
- ▶ Metal scribe
- ▶ Center punch
- ▶ Electrical tape
- ▶ Various adhesives

- ▶ Various gauges of insulated wire
- ▶ 6-in Adjustable wrench
- ▶ Soldering iron or soldering station
- ▶ Rosin core solder (never use acid core solder for electronics)
- ▶ Solder wick
- ▶ Solder flux
- ▶ Magnifying light/jeweler's loupe
- ▶ Volt-ohm meter
- ▶ Small hobby vise

As mentioned above, this is not an exhaustive list but rather, a starting point. You may wish to add a desoldering station if you do much circuit board work or add other drilling, cutting, or shaping tools if you do much work with project enclosures. There are also many crimping tool options for those who make cables for their shack. The direction you go in your hobby ventures will determine which tools you add to your collection. The following are some possibilities for a more comprehensive shop.

- ▶ Non-metallic alignment tools
- ▶ Oscilloscope
- ▶ Signal generator
- ▶ Signal tracer
- ▶ Nano VNA
- ▶ Spectrum analyzer
- ▶ Crimping tool for coax
- ▶ Crimping tool for Anderson Power pole connectors
- ▶ Medium slip-joint or lineman's pliers

Don't overlook using tools you may already own such as a cell phone to take pictures of a circuit board and enlarge the picture to look for solder bridges or breaks

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in circuit board foil traces. Use a label maker you may already have to label panels of projects. I personally like to supplement my tool collection with tools as the need arises. Others like to purchase sets so they will have all sizes of a given tool. This is a personal choice and a shop is very personal so outfit your construction/repair bench in a way that suits your needs and interests and let it develop as you grow in the hobby.

-73, Greg

## *Humbling portable QRP Adventures in Alaska - W6SJE and K6WDE*

**H**igh frequency QRP is defined as low power at 5 watts CW and 10 watts voice (SSB). On June 8, Dave and Sandy Esquer, K6WDE and W6SJE, embarked on their month long 'bucket list' trip to Alaska. Naturally, they took some ham gear along!



The tradeoff was balancing travel gear for 35 days of sightseeing and RVing. Limited by the Alaska Airlines luggage weight limitations, we decided to go QRP with an

**Elecraft KX3**, **Palm Mini paddles**, a **Bionenko 6Ah** (72Wh, under the 100Wh airline limit) battery, a **SOTAbears 6 meter Tactical Mini** fiberglass mast (this one fits in a standard suitcase) and 3 antennas. Two homebrew end-fed half waves (40-10 meters with individual band radiators) and a vertical W6MMA MP-1 Mini Portable Antenna with two runs (25' and 50') of RG8x coax completed the transmission portion. A Nano VNA, miscellaneous connectors, velcro strips, and short wire leads (with PowerPoles, to trim the radiators if needed), completed the radio setup.

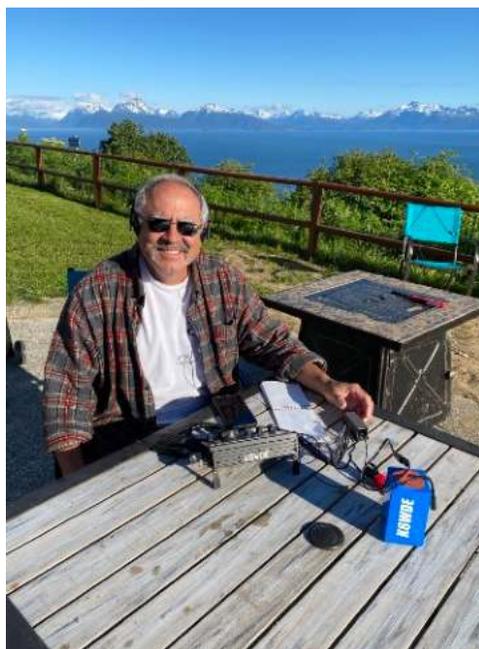
There were opportunities to 'play radio' at Denali State Park (WWFF-KFF/POTA-1641), Denali National Park

(KFF/POTA-0022), Valdez, Seward and Homer, Alaska. We were in Seward during Field Day and stopped by the **Seward Amateur Radio Club** station to introduce ourselves. They were running a home-brew DX Commander vertical antenna, much like the one that AJ6FN has built. The ONLY contact Dave made on Field Day was to the the Seward Club down the road from the campground! He heard plenty of lower 48 stations, but no joy with the pip-squeak signal, even sitting 50 feet from the beach.



The views were fantastic, the mosquitos gigantic and the QRP propagation difficult at best. The poor sun solar activities did not help. Dave quickly

realized that hurdle, especially dry camping in Denali. We were surrounded by Denali herself, at 20,310 feet blocking signals to the lower 48. Our low elevation of 2,500 feet in the NP valley floor didn't help. Challenging became the key word, to say the least.



The KX3, though, has a tremendous receiver and could hear quite well. Spain, Japan, Australia, New Zealand, Northern Europe, Russia (east and west), portions of Canada to our east, and the Pacific Northwest of the USA, could be regularly heard. The trick was

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our tiny transmission signal. Our ONE Denali NP contact was CW to New Jersey (WK2S) and we made TWO voice contacts in Denali State Park (K7PTC and KL2PA).

It was a great adventure, we covered 1,830 miles from Anchorage to Denali to Fairbanks to North Pole, to Delta Junction, to Valdez, via marine ferry to Whittier, to Seward, to Homer, to Soldotna, to Kenai, to Hope, to Alyeska/Glenwood and return to Anchorage.

On YOUR next trip or vacation, BRING YOUR RADIO, you won't regret it! IF you want to see some more of our adventure, [click here for a short 8 minute slide show](#) of the 49th state!

Vy 73, Sandy and Dave

## 13 Colonies Special Event - WM6T

The 13 Colonies Special Event is an annual event hosted by Ken Villone, KU2US and of course the thirteen colony states. In each state a designated club runs this event for a seven day period over Independence Day week. The 13 Colonies have 1x1 call signs from K2A to K2M.

Besides the 13 colonies there are three special call signs including WM3PEN, GB13COL and TM13COL which are from Pennsylvania, Great Britain and France respectively.

The purpose in this contest is to just have fun and make a contact with any of the stations. If you get all thirteen of the original colonies then you have qualified for a "Clean Sweep". Certificates are available as are individual QSL cards from each state.

I have enjoyed participating in this event in the past but had never gotten a "Clean Sweep". Five years ago I had 8 colonies and in 2019 I had contacted 12 and was a bit frustrated to be so close but did not make it. I decided to not participate in 2020. But this year I took a different approach. I told myself it really did not matter and by the way I have some limited (very limited) skills in CW.

My approach was to make contacts on CW because there would be smaller pileups if any. I thought to myself that it really did not matter if my contact mode was CW, SSB, FT8 or FT4. So what I did was to use DXSummit as my spotting tool. I set the filter to only show "K2" since all of the 13 Colonies started with "K2". Was able to add the other three but only heard WM3PEN.

With my focus on CW I set the mode filter to "CW" as well for several hours a day. I worked only 1 to 2 hours a day except for one day where I listened on and off for a total of 5 hours while working on other projects.

Well the excitement caught me after I saw all of those colonies on CW. I made two contacts one day and another the next day. Then two more the following day. Wow, I now have 5. So I convinced myself who cares if I use other modes and besides if I had 2 or more contacts for any one colony it would back up my report in case one of them failed to log me correctly.

	Call	State	CW	SSB	FT8	FT4	Modes
1	K2A	NY	X		X	X	3
2	K2B	VA	X		X	X	3
3	K2C	RI		X		X	2
4	K2D	CT	X			X	2
5	K2E	DE	X	X			2
6	K2F	MD	X			X	2
7	K2G	GA	X		X	X	3
8	K2H	MA	X			X	2
9	K2I	NJ	X			X	2
10	K2J	NC	X			X	2
11	K2K	NH	X	X			2
12	K2L	SC	X		X	X	3
13	K2M	PA	X	X			2
14	WM3PEN	PA			X	X	2
			12	4	5	11	32

I built a spreadsheet to monitor my contacts as well as posting them in my N3FJP log. This spreadsheet helped me know what I was missing so I could focus better.

So now it is on to Route 66 were I will be the caller rather than a chaser.

73, Tracy

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## Local Weekly Nets

	Repeater	Time	Activity	Purpose
Monday	MTARA-2	7:00 p.m.	Weekly Check-in	MTARA news
Monday	144.330 Mhz	8:00 p.m.	'Gordo' net	Simplex readiness
Tuesday	MTARA-5	7:00 p.m.	Weekly Check-in	Tech discussions
Wednesday	HF	7:30 p.m. first monthly Wednesday	7.223 Mhz	Band(s) status
Friday	MTARA-5	5:00 p.m.	XYL Happy Hour!	It's Friday!
Daily	<a href="#">CBARC</a>	7:00 a.m.	Technet	Elmer sessions

## Membership Info

**M**embership in the Mountain Top Amateur Radio Association© is open to any person interested in learning more about Amateur Radio.

Members do not have to be a licensed Amateur Radio Operator to be a member but licensure is recommended. Members must be active in club activities which includes trainings, events, club meetings and Field Day. Membership is on an annual basis and is from January 1 to December 31 of each year. There are no prorated memberships. The annual membership is \$20 for a single member or \$30 for an entire family.

Current members do not need to fill out the renewal application form for 2021. You can just mail your check to MTARA, PO Box 2441, Lake Arrowhead, CA 92352-2441. We already know who you are. Those who joined in November or December of this year are already paid for 2021. The membership form can be downloaded by [clicking here](#).

## The NEW YL Corner! - WB6LVC

**I**n the past few months, I have shared information about YLRL, the oldest organization in existence for ladies involved in Ham Radio as well as some of the women who were crucial in the roles they played to bring women into the field of communication via telegraphy operations. Now I would like to move to the present and discuss another organization that you might not be aware of, a YL that is remarkably busy in the hobby and some Nets you might want to explore.

Another organization that has been around for a while is S.O.A.R. or Sisterhood of Amateur Radio. S.O.A.R. was founded by a group of women back in 2009. During Field Day activities up on Mt Charleston, in Nevada, ("Hams on the Hill") a group of YLs started to discuss what fun their husbands were having, but that the topics they picked to discuss were all wrong! The YL's did not care so much about the newest antennas or what coax to buy; they wanted to create more of a social network, similar to what their mothers and grandmothers had created when working together on a united project or hobby. And so, their club was founded. Elizabeth Bigley-KD7RIN took the lead. They set up guidelines for membership and listed areas they would like to become involved in. To learn more about this club, which has chapters all over the world, go to [www.soar-yls.com](http://www.soar-yls.com).



One of their members who is probably very well-known to you is Dr. Kate Hutton. Not only is she a retired expert on earthquakes, having worked for many years at Cal-Tech in Pasadena, but she is also a

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ham! Below is a short overview of what she has been up to both while working and after retirement. (Taken from S.O.A.R's recent newsletter)

Morse Code has not been a problem for Kate Hutton-K6HTN. Kate, who is an ARES Morse Code Instructor, is also the recipient of the Brass Pounders League Medallion. Additionally, Kate serves as Net Control Operator for the Los Angeles Net, the Southern California Net, and for the Sixth Region Net. Kate serves as the ARRL Traffic Manager for the Los Angeles Section and is also an ARRL Official Relay Station. Kate is active in many Amateur Radio organizations.

And finally, I would like to share a few Nets that you might be interested in checking out. This is a link that will take you to a variety of nets, many that are international. Based on your license and equipment situation, you may not be able to work some of them, but I thought you would like to see just how many active groups there are. So just click on the link below to get a PDF file that you can print out for future needs.

## [YL Nets - YL Harmonics](#)

If you do Facebook, the [Ladies of the Net FB page](#) can be found and **their net meets at 10:00 AM Monday through Friday on 7.245 Mhz** (40 meters). Until next time...

33-WB6LVC-Debbie

## *W6C, Route 66 Special Event and the Wigwam Teepees - new this year!*

**T**he Citrus Belt Amateur Radio Club (CBARC) continues preparing for the [22nd annual Route 66 Ham Radio Special Event](#). It will take place from **September 11 through the 19th**. As in years past, operators of MTARA (also members of CBARC) have assisted in operating as W6C (the San Bernardino station) from their home QTHs as well as supported the Patton State Hospital club station.

In addition to that station, we will be operating on

**Monday, September 13 and Thursday, September 16, from the iconic [Wigwam Motel](#) on Foothill Blvd., the actual Route 66!** This will be a 2-radio portable/solar station and will be operational from 10am to 3pm both days.



We are looking for MTARA members to work the station as operators. All equipment will be provided for SSB and CW operations. All COVID-19 protocols will be

in place and all necessary sanitizing equipment will be onsite. Newly minted ham radio operators as well as seasoned veterans are highly encouraged to participate. If you have a favorite CW key, bring it!



There will be more information coming soon on how to participate as an operator AT the station, at your home QTH, or as a chaser. We look forward to providing another W6C option for chasers throughout the U.S. for this special event!

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## *Upcoming Calendar of Events*

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Activities that MTARA will be participating in or supporting during the upcoming months:

- ▶ MTARA monthly meeting - August 3 at 7:00 p.m.
- ▶ MTARA monthly meeting - September 7 at 7:00 p.m.
- ▶ August 7 - Tour de Big Bear communications support
- ▶ August 20-21 - Kodiak 100 communications support. To help, contact John, W6GC, at johndemig@gmail.com
- ▶ September 11-19 - Citrus Belt Amateur Radio Club Route 66 Special Event
- ▶ September 25 - Big Bear Gran Fondo communications support
- ▶ December 4 - Blue Jay Christmas Parade communications support
- ▶ TBD - "I am Lost" Field Training
- ▶ TBD - Digital Modes Workshop

## *Upcoming VHF/UHF and HF Ham Radio contests or special events*

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A few fun events that club members can participate in and/or sharpen their communication skills with!

- ▶ [Slow Speed Con\(Test\)](#) for CW operators, **EVERY SUNDAY** (5:00 - 6:00 p.m., PDT ) and **EVERY FRIDAY** (1:00 - 2:00 p.m., PDT), a great learning tool for us new operators!
- ▶ [Weekly Phone Fray](#) by NW2K. A great way to get your feet wet for 30 minutes. It is weekly on Tuesday nights from 6:30 p.m. to 7:00 p.m. PST on SSB. The rapid-fire exchange is OP name and location ('Dave CA', e.g.). Folks start on 15 meters and then migrate to 20, 40, 80 and even 160 meters, its fun to watch the bands change as seasonal propagation does!
- ▶ **Route 66 On the Air!** September 11-19, 2021. See the [Citrus Belt Amateur Radio Club](#) (CBARC) for more details.
- ▶ The 56th running of the [California QSO Party](#), October 2-3, 2021
- ▶ Ongoing, updated [Contest Calendar](#) sponsored by WA7BNM, there is something for everyone, check it out!

## *MTARA shirts and jackets*

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 We have our optional MTARA logo shirts and jackets available so that you too can look smart and cool! If interested, please contact Mary at Classic Images in Crestline. Her telephone number is 909-338-2281 from Tuesday through Friday at 23723 Rocky Dell Drive, Crestline, CA 92325.

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Welcome to “Ponder the Pool” by AA6GJ

**P**onder the Pool is my column for the MTARA Newsletter. Every month I pick a point to ponder (a question) from one of the three FCC question pools and try to explain it more and review the concepts because,

**“If you don’t use it, you lose it!”**

This time, we will ponder a question from the Technician Class pool: Question No. T7D10 (Pg. 170 in Gordo’s Technician Book)

## **T7D10 – What is probably happening when an ohmmeter, connected across an unpowered circuit, initially indicates a low resistance, and then shows increasing resistance with time?**

This is a quote from Gordo right out of his Technician Class Book, “If you have a big old capacitor hanging around the shack, keep it handy! That big old capacitor has a telltale signature when you check it with an ohmmeter. On a high ohm reading scale, the discharged capacitor will first look like an almost short circuit, and then show increasing resistance as the capacitor begins to charge up from your ohmmeter test. OK, that’s nice, but how can we use this principle in the real world of ham radio? Let’s say you brought in 5 lines of coaxial cable from your roof to the shack and you forgot to tag which one goes where. Use a couple of alligator clip cables to connect the big electrolytic capacitor across one coaxial cable end. Now, head for the roof. Put your ohmmeter on an intermediate scale and start testing each cable. All but one will look like an open connection, other than the one terminated with the capacitor, which looks like low resistance, and then you see the meter needle slowly dropping, showing an increase in resistance with time. You’re so smart!” Thank you, Gordo!! Great advice! (West, G and Nichols, E (2018). 2018-2022 Technician Class License Manual. Master Publishing Inc.)



An electrolytic capacitor is a polarized capacitor whose anode or positive plate is made of a metal that forms an insulating oxide layer through anodization. This oxide layer acts as the dielectric of the capacitor. A solid, liquid, or gel electrolyte covers the surface of this oxide layer, serving as the cathode or negative plate of the capacitor. Due to their very thin dielectric oxide layer and enlarged anode surface, electrolytic capacitors have a much higher capacitance than ceramic capacitors or film capacitors.

The large capacitance of electrolytic capacitors makes them particularly suitable for passing or bypassing low-frequency signals, and for storing large amounts of energy. They are widely used in power supplies to filter out the rippling affects from left over

alternating current so that we have a pure battery-like direct current on the output to supply a constant 13.8 volts to our radios. They are also for storing energy as in your electronic flashlamp to give off that great high voltage flash.

Electrolytic capacitors are polarized components due to their asymmetrical construction and must be operated with a higher voltage (i.e., more positive) on the anode than on the cathode at all times. For this reason, the anode terminal is marked with a plus sign and the cathode with a minus sign.

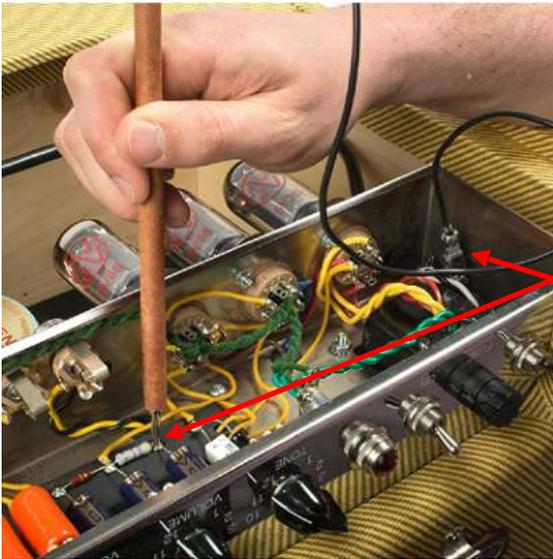
Applying a reverse polarity voltage, or a voltage exceeding the maximum rated working voltage of as little as 1 or 1.5 volts, can destroy the dielectric and thus the capacitor. The failure of electrolytic capacitors can be hazardous, resulting in an explosion or fire. And that would be no fun at all!

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(Wikipedia contributors. (2021, March 10). Electrolytic capacitor. In Wikipedia, The Free Encyclopedia. Retrieved 03:18, July 17, 2021, from [https://en.wikipedia.org/w/index.php?title=Electrolytic\\_capacitor&oldid=1011388347](https://en.wikipedia.org/w/index.php?title=Electrolytic_capacitor&oldid=1011388347))

One more aspect of polarized electrolytic capacitors is that when they are installed in high voltage power supplies, or any power supply for that matter, when the voltage is removed from the power supply, the capacitors will maintain their charge unless there is a “bleeder” resistor across them. Even if there is a bleeder resistor that discharges the capacitor, you can't trust them because over time those resistors tend to open up thus providing no protection, and since they are not a vital part of the circuit, there is really no way of knowing whether they are good or bad.



This technician is discharging a power supply capacitor using a shorting stick connected to ground.

If you want to see a neat video I made demonstrating the above concepts, check out this [video](#).

So, if we are working on a circuit and we suddenly run across this “needle moving phenomenon”, we now know that we have run into our old friend the capacitor. Now, happy troubleshooting, and don't get fooled anymore.

**The official answer to this question is: The circuit contains a large capacitor.**

There you have it, Ponder the Pool for another month. I hope it was helpful. Stay tuned, and we'll do another one next month. 73 – Gary

If you have any questions or comments, drop me an email at [AA6GJ@arrl.net](mailto:AA6GJ@arrl.net)

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**Field Day Photos, enjoy! Thanks to all who volunteered during stations setup, breakfast, lunch and dinner food prep, 'playing' radio, manning the inside informational stations and evening tear down. We'll do it again in 2022!**

