Mountain Top Amateur Radio Association

July—August 2024

Volume 4, Issue 3

MTARA NEWS

Editor's Note

We hope that everyone has had a pleasant summer, and that you have survived the heat and all the tourists that have invaded the mountain communities. The high temperatures are continuing, so keep a sharp eye for indications of fire. And also take care of yourselves by staying cool and hydrated.

On that note, let's head in to Fall and Winter when many more Ham events are taking place. Keep your eyes open for postings on various amateur radio sites for ongoing contests in the area and a major Fall event-**Pacificon**. If you hear of an event that might be of interest to the club members, get in touch with a Board member to see if they can share it in an email to others or on our website. Have fun with our great hobby!

73-Debbie/WB6LVC

Route 66 On the Air

September 7th to September 15th, 2024

Officers

- **President:**

Vic Marquez, KK6WKI

- **Vice-President:**

Lorna Polley, KJ6GFS

- **Treasurer:**

Nancy Karlson, K6CUB

- **Secretary**

Gail Brarmann, KM6GBN

- **Ed/Membership:**

Tracy Lenocker, WM6T

- **Past Presidents:**

Chrystal Stenberg, KK6API

John Snedden, KT7P

Vic Marquez, KK6WKI

Lorna Polley, KJ6GFS

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

Monthly Club Meetings

Club meetings are held on the first Tuesday of each month. The meeting begins at 7:00 p.m. and lasts until approximately 9:00 p.m.

Our meetings are open to everyone; so bring a friend, and keep the hobby growing.
There is always a presentation that will pique your interest and add to your knowledge.

Meetings are held at the Lake Arrowhead Community Presbyterian Church
351 South State Highway 173, Lake Arrowhead, CA 92352

Membership

Membership in MTARA is open to any individual interested in learning more about Amateur Radio. An FCC issued license is not required, but is encouraged. Membership is on an annual basis, running for the calendar year. There are no prorated membership fees. Club fees are $20.00 for a single membership and $30.00 for a family membership. The necessary forms can be found on the club's home page @ MTARA.club. Current members only need to send in their dues to MTARA, PO Box 2441, Lake Arrowhead, Ca. New members will need to download and send in their forms and payment to the same address.

TREASURER'S REPORT

As of September 3, 2024, the Club's Balance was:

$14,922.00

Income:

$2,060.00

73, Nancy, K6CUB

Local Weekly Nets

	Repeater	Time	Activity	Purpose
Monday	MTARA—2	7:00 p.m.	Weekly Check-In	MTARA News
Wednesday	HF Net	7:30 p.m. First Wednesday	7.223 MHz & Zoom	Band(s) Status
Daily	CBARC	7:00 a.m.	MTARA Ch. 32 Tech. Net	Elmer Sessions
Daily	CA Rescue Comm. Net	8:30 a.m.	7.250 MHz	EMCOMM Net

Upcoming Calendar 0f Events

- 9/7-9/15—Route 66 on the Air
- 9/14—Route 66 on the Air at the Wigwam Motel in San Bernardino sponsored by CBARC— 0900 to 1700 PDT
- 9/15-9/16—ARRL September VHF Contest
- 9/21-9/22—ARRL Ten GHz and Up Contest
- 9/28-9/29—CQWW DX Contest—RTTY
- 10/5-10/6—ARRL Simulated Emergency Test
- 10/18-10-20—Pacificon—Pacific Division ARRL Convention
- 10/18-10/20—Scouts— Jamboree On the Air

Major Ham Events, Both Old and New

by WB6LVC

May brought the Dayton Hamvention in Xenia, Ohio. Gary (AA6GJ) attended this major event two years ago as a "first timer" and was overwhelmed by all that took place. He thought that it would be great if we could go together this year. So, on May 11th, we took off from Ontario Airport and flew to Dayton, Ohio. We stayed in Wilmington, not far from Xenia. I had never been in any part of Ohio, so this was a true eye-opener for me. Everywhere I looked, I saw lush green fields, farms and open spaces. But unlike California, there are no mountains. Such a different environment! On Friday morning, May 17th, we made our way to the Xenia Fairgrounds. The skies were dark and cloudy as opposed to the previous day's sunshine. I had brought a rain parka per my OM's suggestion, but I wasn't prepared for the downpour that drenched us all as we were standing in line for admission. It went on for at least a full 15 minutes solid!! Needless to say, I was not too happy about being drenched to the skin. Even my backpack got soaked. But, if you are from that area, you know that the weather can change quickly. Within an hour or so, I was almost dry as were most of my supplies! (And no wonder it is so green there.) Besides wishing to participate in this great Hamvention, we also attended to be of assistance to Gordon West at his ARRL Instructor Academy Forum. Helping Gordon at these events has been a wonderful experience for both of us. Gordon also promotes Gary's on-line classes and his teaching techniques to the many people he comes into contact with at hamfests, conventions and gatherings of the Ham Community which we really appreciate. Besides Gordon's Forum, there were over 54 other forums and speakers who shared their knowledge about the various ham topics such as operating, contesting, building kits, working with the youth, antennas, SOTA and POTA activities and the newer technologies of FT8, digital components and so much more.

Going from a well-established ham activity to one that is brand new, July brought the **Hamcon:Zion** to the calendar of events. It was held at the beautiful **Dixie Convention Center**. This was a wonderful location! They had enough room to not only have a nice layout for the exhibitors, but also room to hold the Swap Meet inside! And that was a good thing to be able to do as the temperatures reached as high as 118 degrees!! Gary and myself, along with Gordon West, drove out to St. George on the Thursday before the opening of the convention. Gary and I were going along to help Gordon in the ARRL booth with information about the Instructor **Learning Center** (ARRL) offered by the league to Registered Instructors. I was also there to take part in another event being held in conjunction with the Zion group; it was the 85th anniversary of the YLRL organization. SO, I was playing two roles at this event: working with ARRL and Gordon and attending the YLRL convention as a district chair. I soon knew where every vendor and forum activity were taking place! Because of my agenda, I did not get to attend as many of the YLRL activities as I would have liked to. But it was great to meet so many of the attendees and be in the group photo.

Dayton Hamvention 2024 and HamCon:Zion

Mountain Activities
by WB6LVC

The beginning of August brought two events to the mountain communities. First, was the annual parade held in Running Springs: *The Mountain Top Days Parade*. As Stan Howe/KI6YLG has moved to Arizona, Craig Stenberg /KK6APH has taken over the organization of communications for the event. We were a bit low on volunteers, so at the pre-meeting for the event, on the day it was taking place, radio operators were shifted to various locations that needed the coverage. Being the outstanding "professionals that we are," everyone agreed to the changes and took up their posts as directed. Everything went well, and another successful parade was put in the books. Congratulations to Craig and his team for a job well done!!

Next came the *Tour de Big Bear* bike ride. This is, as you know, a world-renown event, bringing bikers from all over to be participants in this amazing activity. Ham operators provided communications at aid stations and various locations on the race routes. Gary and I were located at the farthest point in the race, the turnaround spot for the 100-mile race. The Lions Club staffed our aid station. Their theme was Tropical Vacation. As you can see from the photos, they really get into their theme!! The aid station provided support to almost 500 riders who took part in the longest race of the day. Overall, the race had 3,000 riders participating in races of various lengths. With that many people being involved in a physically challenging activity, we did have medical emergencies, accidents and equipment problems to deal with. We dealt with minor injuries, transport for riders who had to stop and withdraw from the race, all the way up to a Medivac emergency when a rider collapsed and had to be transported by helicopter to a hospital. Without our assistant, these individuals would have been on their own. Thanks to all the hams participating, that was not the case. A big "Shout Out' goes to Dede/K6DDZ and Tracy/WM6T and all of the volunteers who worked on this event, not only on the day of the race, but all of the days leading up to it as well as follow-up reporting. It could never have been the success it was without everyone's support.

tour de big bear
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REGISTERED
PARTICIPANTS ONLY
NO WRISTBAND AND
NUMBER PLATE...
NO AID STATION ENTRY

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www.TourdeBigBear.com

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DISTANCE TO
NEXT AID STATION
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QRZ

Ponder the Pool

by AA6GJ

Ponder the Pool is a way for us as Amateur Radio Enthusiasts to dive into selected questions more deeply from each of the current FCC pool of questions used to create the randomly generated Examinations for the Technician, General, and Amateur Extra License. Ponder the Pool is helpful to individuals who are studying for an exam or simply to review concepts that we have already learned.

Because, as we know, if we don't use it, we lose it.

The question we will ponder today comes from the new Extra Class pool.
Question: *E5A01 – What can cause the voltage across reactances in a series RLC circuit to be higher than the voltage applied to the entire circuit?*

In a series RLC circuit, the voltage across the reactances (inductor and capacitor) can be higher than the voltage applied to the entire circuit due to resonance. At resonance, the inductive reactance and capacitive reactance cancel each other out, resulting in a significant increase in the voltage across each reactance. This phenomenon occurs because the circuit stores and transfers energy between the inductor and capacitor efficiently, leading to higher voltages across these components.
Let's take a closer look.

On the next page I have drawn a series circuit which consists of a resistor, capacitor, and inductor. In order to figure out what the voltages are in the circuit we will have to do some math. I'm so sorry, but if we do them in steps, it won't be too cumbersome. Also, it will be very helpful to have a scientific calculator.

Our first and second step is to calculate the reactances using the following equations, $X_C = \frac{1}{2\pi fc}$ for capacitive reactance, and $X_L = 2\pi fl$ for inductive reactance. I have already solved the circuit resonant frequency. It is 3,753.22 Hz. (I have done all the math on the next page in the red box.)
The third step is to calculate the impedance (Z). This turns out be relatively easy because at resonance $X_L = X_C$ so they cancel out and all that is left is the resistor which is 100Ω. So, our impedance (Z) is 100Ω.
Our fourth step is good old Ohm's Law where we calculate the current (I) which equals 0.05 A. Step five is just there to check our math by multiplying I x Z which equals our original 5 Volts.

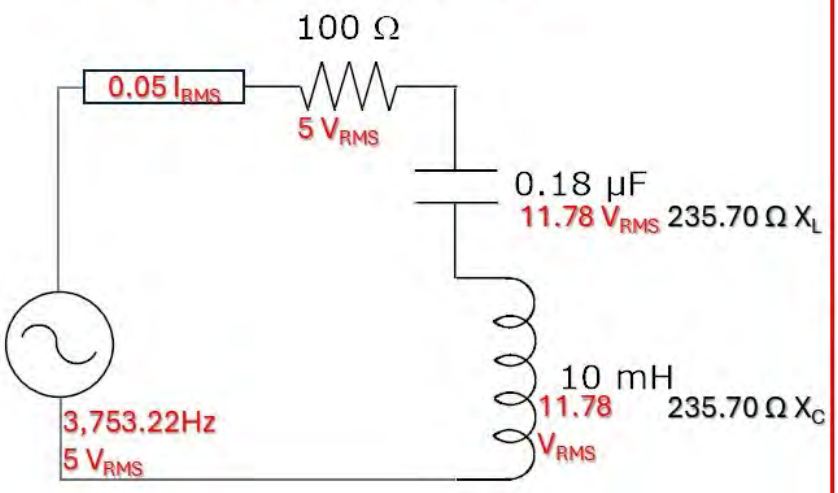
Step six and seven is where it really gets interesting. Because of the phenomenon known as resonance, the voltage across the inductor and the capacitor is **higher** than the original 5 volts. It is almost 12 volts.

In an RLC circuit, the voltage across the inductive (L) and capacitive (C) reactances can be higher than the supply voltage due to the phenomenon of resonance. Here's a brief explanation:

Resonance: At resonance, the inductive reactance (X_L) and capacitive reactance (X_C) are equal in magnitude but opposite in phase. This causes them to cancel each other out, resulting in a minimal overall reactance. However, the voltages across the inductor and capacitor can still be quite large because they are 180 degrees out of phase with each other.

Impedance: The impedance of the circuit is at its minimum at resonance, which means the current is at its maximum. This high current can cause significant voltage drops across the inductor and capacitor, even though their reactances cancel each other out in terms of the overall circuit impedance.

Voltage Magnification: The voltages across the inductor and capacitor can be many times larger than the supply voltage due to the high current flowing through them at resonance.



$$f = \frac{1}{2\pi\sqrt{LC}}$$

$$f = \frac{1}{6.28\,x\,\sqrt{.01\,x\,.00000018}}$$

$$f = 3{,}753.22\ Hz$$

Steps to obtain voltage across reactances in a series RLC circuit

Step 1. $X_C = \frac{1}{2\pi fc}$

$$235.70\Omega = \frac{1}{6.28\,x\,(3753.22\,x\,.00000018)}$$

Step 2. $X_L = 2\pi fl$

$$235.70\Omega = 6.28\,x\,(3753.22\,x\,.01)$$

Step 3. $Z = \sqrt{R^2 + (X_L - X_C)^2}$ At Resonance $X_L = X_C$

$100\Omega = \sqrt{10{,}000 + 0^2}$ Therefore X = 0 and Z = the 100Ω Resistor

Step 4. $I_{RMS} = \frac{V_{RMS}}{Z}$

$$0.05\,A = \frac{5}{100}$$

Step 5. $V_R = I_{RMS}\,x\,Z$

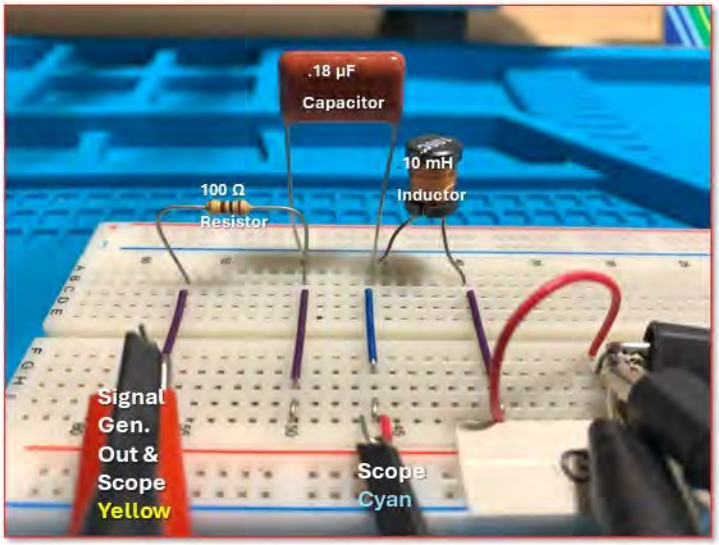
$$5\,V = 0.05\,x\,100$$

Step 6. $V_L = I_{RMS}\,x\,X_L$

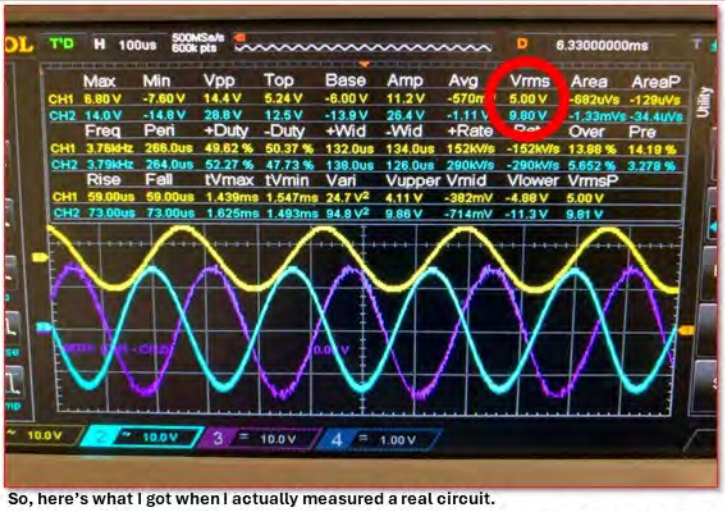
$$11.78\,V = 0.05\,x\,235.70$$

Step 7. $V_C = I_{RMS}\,x\,X_C$

$$11.78V = 0.05\,x\,235.70$$



Series RLC Resonant Circuit



So, here's what I got when I actually measured a real circuit.
The Yellow Waveform above is the Peak-to-Peak voltage on the input of the circuit from the Signal Generator. The RMS voltage is the 5 V which we used for our equation.
The Cyan and Purple Waveforms are the Peak-to-Peak voltages of the reactances (X_L Cyan, X_C Purple). You can see that the voltages across the reactances are equal and 180° out of phase. **This causes them to cancel each other out, resulting in a minimal overall reactance. However, the voltages across the inductor and capacitor can still be quite large because they *are* 180 degrees out of phase with each other.** You can also see that the RMS voltage is 9.8 V which is more than the 5 volts in the entire circuit. I only showed the Cyan waveform because the Purple waveform has the identical voltage at resonance.
Our equation says we should have 11.78 V across our reactances as opposed to our actual 9.8 V, a difference of 1.98 V. Not too bad, but it did prove *that the voltage across reactances in a series RLC circuit is higher than the voltage applied to the entire circuit.*

That is why the official answer to this question is:
E5A01 - Resonance
That's *Ponder the Pool* for this time. I hope it was helpful.

Stay tuned, next time we will come up with another question to ponder. 73 – Gary
If you have any questions or comments, drop me an email at AA6GJ@arrl.net

2020 Extra Class study guide: E5A - KB6NU's Ham Radio Blog
Series RLC Circuits, Resonant Frequency, Inductive Reactance & Capacitive Reactance - AC Circuits
Series RLC, Ohms, Amps, & Volts
Series Resonance in RLC Circuit
FCC Commercial Element 3 pool, section 29 - HamStudy.org
Series RLC Circuit Analysis - Basic Electronics Tutorials and Revision
Amateur Extra pool, section E5A - HamStudy.org
Series Resonance in a Series RLC Resonant Circuit
Series RLC Circuit Analysis - Basic Electronics Tutorials and Revision
23.3: RLC Series AC Circuits - Physics LibreTexts
RLC Circuit Analysis (Series And Parallel) - Electrical4U

Amateur Radio Exams Now Online or In-Person!

No Paper! All Electronic! Very Cool!

with K6DDZ & AA6GJ

Now that MTARA is back to in-person meetings, amateur radio testing will be offered before each meeting. Testing will cover all three elements (Technician, General and Amateur Extra). Remote (online) testing is also available by appointment.

For MTARA in-person or remote testing, please go to
K6DDZ Amateur Radio Testing – Amateur Radio Testing Made Simple!

ONLY ONE CLICK to:
Order Gordon West's study materials
HamStudy.org Practice Tests (all levels)
Schedule a Test (in-person or remote)
Get Your FCC Registration Number (FRN)
Pay for Your Test
...and even click to Gary's (AA6GJ) video training for more in-depth knowledge

Let's keep it simple! Any questions, email Dede Hermon at DedeK6DDZ@gmail.com

And if you are DTH (Down the Hill) and want and an in-person exam or a remote exam on Zoom

You can test *all* classes of license with us.

That's my team AA6GJ and the Group

WE6ARG West End Amateur Radio Group

Take Care and Get On the Air

If you are interested, drop me an email at AA6GJ@arrl.net to set a time, either online or in-person or to just get information. We can help you with your FRN, too.
73,
Gary West End Amateur Radio Group (garyrjohnson.org)

Mountain Top Amateur Radio Association

The Amateur's Code
by Paul M. Segal, W9EEA (1928)

The Radio Amateur is:

CONSIDERATE never knowingly operating in such a way as to lessen the pleasure of others.

LOYAL offering loyalty, encouragement and support to other amateurs, local clubs and the American Radio Relay League, through which Amateur Radio in the United States is represented nationally and internationally.

PROGRESSIVE with knowledge abreast of science, a well built and efficient station, and operation beyond reproach.

FRIENDLY with slow and patient operation when requested, friendly advice and counsel to the beginner, kindly assistance, co-operation and consideration for the interests of others. These are the hallmarks of the amateur spirit.

BALANCED Radio is an avocation, never interfering with duties owed to family, job, school or commu-

MTARA Shirts, Jackets, and More

We have many items available with our club logo.

The information for ordering is as follows:

- Name Tags—Harlan Technologies, Name Tags by Gene (715) 340-1299, www.hampubs.com
- Mouse Pads—Check with Jodi, WA6JL
- Polo Shirts—Port Authority 510L Dark Green, 510K Dark Green, Long Sleeve Dark Green.-Check with Brandy
- Jackets—Forest Green or Black J317. Sizes Small to 6X
- Brandy will also embroider hats. You must supply the hat.
- Contact:

Hurt Ink

2651 Coleen Lane

San Bernardino, CA 92407

(909) 815-6852

hurtink815@gmail.com

www.hurtink.com