



P.O. Box 6421 Auburn, CA 95604

April 2019

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At The Key of SFARC:

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Satellites: Greg, KO6TH
Sunshine: Richard, WA6RWS

GROUPS io

Dennis Gregory, WU6X

PIO

Scott Vogelsang, WA6YNE

REPEATERS

145.430 (-0.6 MHz/PL 162.2)
440.575 (+5.0 MHz/PL 162.2)
223.860 (-1.6 MHz/PL 110.9)

CLUB NET

Thursdays, 7:30PM, W6EK/R
145.430

CLUB MEETINGS

Second Friday of the month,
7:30PM at the Auburn City Hall,
1215 Lincoln Way, Auburn CA

CLUB BREAKFAST

Last Sat of the month at Mel's Diner
1730 Grass Valley Hwy, Auburn 7:30AM

NET CONTROL OPS

Dave Jenkins, WB6RBE
Casey McPartland, W7IB
Bob Brodovsky, K6UDA
Al Martin, NI2U

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Barbara Anderson, W6EVA
anderson51@wavecable.com

WEBMASTER: Herb Garcia, KM6JBI

VOLUNTEER EXAMINER

Al Martin, NI2U

Calendar of Events

April 12th:
Club Meeting

April 21st:
Easter Sunday



April 27th:
Club Breakfast

June 22nd & 23rd:
Field Day

Inside this issue

- *President's Message*
- *Photographs from the STEM & Hamfest*
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- *Board & General Minutes*
- *Laser Generated Antennas*



We encourage members to receive Sierra Signals via email to save the Club the cost of reproduction and mailing

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President's Message

*By Orion Endres – AI6JB,
President*

STEM Expo, 2019, William Jessup University, Rocklin

Once again, it was a great event thanks to Michael, KK6GLP! Michael organized this year's ARRL booth. With the help of Jim, WA8MPA, Greg, KO6TH, and members of the Western Placer, River City, and Samuel F. Morse ARCs, it went off without a hitch.

Greg wow'd the kids and their parents with APRS and amateur radio satellites. Jim brought some "eye candy" in the form of huge RF tubs, a circuit board from the CRAY 1 supercomputer, and an ABC Radio microphone rumored to have been used by Edward R. Murrow during his broadcasts.

Members from the SFM ARC, inspired the CW operators of the future by showing them how to send their names in Morse code. There was plenty of fun for all! Check out the pictures on the Groups.io site.

Hamfest 2019 Is No in the History Books!

We couldn't have asked for better weather! And the sellers and buyers agreed by showing up! We counted only 4 stalls left when the dust settled!

George, KG6LSB, Chip, KM6MDF, and their Setup Team got things started bright and early before 4:30 AM with setup. Of course, Carl, N6CKV, Mike, KK6GLP, and the Parking Crew weren't going to let them have all the glory as they were there too to setup up barricades and signs. Jim, WA8MPA, and the Club Table team once again had plenty of high-quality gear for the offering. And to prove it, Richard, WA6RWS, was there with test equipment at the Test Bench to make sure. Al, NI2U, was also at the Test Bench offering Elmer Tours of the Hamfest to new hams. Jerry, WA6E, and the Concession team had plenty of hot coffee and donuts to enjoy while the buyers perused the offerings. Dennis, WU6X, effortlessly took the sellers' money as our Vendor Relations guy and worked with Bruce, K6BAA, and his Security team to find sellers the perfect spot. Bob, K6UDA, and Tyghe, W6TJR, once again gave the Hamfest its unique atmosphere as our MCs for the day.

Doug, W6VX, and the Drawing team feverishly sold drawing tickets and greeted the many winners. Our grand prize winner this year was Colby, KM6ZKQ, from Paradise, CA. Colby is one lucky guy! Not only did his house NOT burn down in the Camp Fire, he was our 2nd prize winner AND the winner of the Baofeng Tri-Bander donated by Herb, KM6JBI. Congratulations Colby!

Speaking of the Camp Fire, we had two fabulous presentations. The first was Camp Fire: Phones, Fire, and Fails by Alan, W6WN. In the second session, Greg, KO6TH, showed how APRS works and all the exciting things you can do with it. Both talks were well attended and received.

The initial numbers show this could be our best year so far. We will have a Hamfest Debrief at our next Club meeting.

And perhaps the most exciting news, for me personally, Alan, W6WN, has graciously offered to chair the Hamfest 2020 Committee. I have enjoyed every minute as the Club's Hamfest Chair due to all the great support from you, the members! Thank you!!

Western States Isn't the same day as Field Day

Yes, you heard correct, Western States Endurance Run (WSER) is on the same weekend as Field Day this year. That means this is your opportunity to get involved with 100 mile endurance race from Squaw Valley to Auburn. WSER needs radio operators for the event itself and several of their training and qualifying events. If you would like more information, go to:

<https://www.wser.org/volunteering/communication/>.

If you would like to volunteer, go to:

<https://www.wser.org/volunteering/communication/communication-volunteer-form/>.

If you have any questions, contact Joe, K6SAT.

Next Up Field Day 2019!

Field Day this year is on the 4th weekend of June, the 22nd & 23rd. Already the Field Day team has secured the site and created a T-Shirt!!

This year, Field Day will be at the Blue Canyon Airport off I-80 near Nyack. It offers many new opportunities and we get away from all the RFI at our old location. Stay tuned for more details in the coming months.

Bob, K6UDA, and the Field Day team have designed a T-Shirt. If you want to see what they have created, go to:

[https://w6ek.groups.io/g/sfarc/topic/field day 2019 t shirts/30402048?p=,,20,0,0,0::recentpostdate%2Fsticky,,,20,2,0,30402048](https://w6ek.groups.io/g/sfarc/topic/field%20day%202019%20t%20shirts/30402048?p=,,20,0,0,0::recentpostdate%2Fsticky,,,20,2,0,30402048).

Bob is taking pre-orders. Just follow the link and "Reply" with your order. If that doesn't work for you, email him at k6udaradio at gmail.com.

Hope to hear you on the air soon!

Orion, AI6JB
President

STEM EXPO - 2019
William Jessup University
Rocklin, CA





**Hamfest - 2019
Loomis, CA**



**Congratulations George, KG6LSB
He was presented with Meritorious Life Membership
March 8th, 2019**

Radiation

By Jim Heck, W7JVH

Retired Director of Engineering of Radio HCJB-Ecuador, S.A.

Greetings to All,

Perhaps something should be said about “radiation”. It comes in two kinds: ionizing and non-ionizing. Their difference has to do with the wavelength of the signal and what those signals do to our bodies when they strike us.

Ionizing energy causes electrons to be stripped from the atoms they strike. That destroys our tissue and organs. We call it radiation poisoning, and it will indeed kill you as it did to many people living in Nagasaki and Hiroshima, Japan. The sun and nuclear explosions are sources of ionizing energy.

Non-ionizing energy does not strip electrons off the atoms in our body. It does however cause those atoms [and cells] to vibrate back and forth rapidly. As the cells vibrate they take energy from the signal. This causes the cells and tissues of our body to heat. If the cells over heat they are damaged....or it could be said we are “cooked”. Microwave ovens use this vibration phenomenon to heat food.

Not being cooked is controlled by a number of factors. Here are the most important:

1. If our body is small compared to the wavelength of the signal’s energy, it will not absorb much of the signal.
2. Your body has a blood circulatory system which will carry the heat to your outer skin surface and lungs where it is conducted out or off of the body. Therefore, little or no damage results. You will sense “heat” if you are being exposed to a signal level your body is having trouble cooling down from. Eyes, which have little blood circulation, are the most easily damaged organ of our body from the heating situation. And thus the old saying “never look down a waveguide” is still true today.

Therefore, we can conclude that the danger to the human body from non-ionizing radiation sources exists when the signal wavelength compares to or is smaller than our bodies. That would be signals in the VHF, UHF, and microwave wavelengths/frequencies.

OSHA has established required maximum radiation levels standards for people working in both ionizing and non-ionizing areas. People working around large active microwave antennas or on broadcast towers, which have FM and television installations need to pay close attention to OSHA standards which are intended to keep them from harm.

Recovery from radiation energy injuries is a slow process without happy outcomes guaranteed. The reason is that the radiation damage tends to go deep into our tissues and organs. Our bodies will have a rather serious up-hill climb to recovery the function of those important organs.

Can Indoor Antennas Work? Yes!

By *Dan Romanchik, KB6NU*

Recently, a reader asked:

"I am studying your No Nonsense book as I prep for the Technician test. I am also learning CW. I am going to buy a Yaesu FT 450D as my first radio, and I want to use an indoor antenna as my first antenna. What do you recommend for CW?"

I replied:

"To be honest, I've never had a lot of luck with indoor antennas. Don't let that dissuade you, though. I have worked many hams with indoor antennas. Just recently, for example, I worked a guy who was using a Buddipole (<http://www.buddipole.com/>) inside his apartment.

"If you have an attic, you could easily install a dipole up there. The ARRL web page on indoor antennas (<http://arrl.org/indoor-antennas>) notes, 'Attics are great locations for indoor antennas. For example, you can install a wire dipole in almost any attic space. Don't worry if you lack the room to run the dipole in a straight line. Bend the wires as much as necessary to make the dipole fit into the available space....Ladder-line fed dipoles are ideal for attic use—assuming that you can route the ladder line to your radio without too much metal contact. In the case of the ladder-line dipole, just make it as long as possible and stuff it into your attic any way you can. Let your antenna tuner worry about getting the best SWR out of this system.'

"There are plenty of remote tuners now, too. You could install a doublet with elements as long as you can make them, connect them directly to the remote tuner, and then run coax to your shack.

"I have also worked guys who have used Slinky antennas inside a house. The advantage of using a Slinky is that it is electrically longer than a wire of the same length.

"An attached garage might also make a good location for an indoor antenna. VE3SO, who I've worked several times, uses a magnetic loop antenna installed in his garage (<https://www.kb6nu.com/magnetic-loop-antenna-at-ve3so/>).

If you do a web search for "indoor amateur radio antennas," you'll get many more ideas. Here are a few that looked promising to me:

* Indoor antenna for 7 Mhz (<http://www.iw5edi.com/ham-radio/37/indoor-antenna-for-7-mhz>)

* An Indoor Reduced Size Rectangular Loop (<http://hamuniverse.com/kl7jrindoorloop4010.html>)

"Another option might be to load up your gutters! I've worked a couple of guy who use gutter antennas, including WA8KOQ (<https://www.kb6nu.com/operating-notes-gutter-antenna-rac-contest-161-countries-worked/>) and K3DY (<https://www.kb6nu.com/operating-notes-computer-virus-club-net-gutter-antenna/>)."

This blog post garnered a couple of interesting comments. K2MUN wrote, "For many years I've used an attic mounted off-center fed 40 meter dipole. With an automatic antenna tuner and a 4:1 balun I've worked lots of dx with both qrp and, more easily, 100 watts! Certainly, outdoors is much superior but an attic is a nice location in bad weather making playing with your antenna a pleasure :-).

John, KDOJPE, said, 'If you have an attic available, check out the following 6-band coax trap-based antenna: <http://degood.org/coaxtrap/>. I constructed one of these 9 years ago and have had great results with it.

The bottom line is that indoor antennas can definitely work. They may take more work to put up than outside antennas, but as the saying goes, "Any antenna is better than no antenna."

=====

Dan Romanchik, KB6NU, is the author of the KB6NU amateur radio blog (KB6NU.Com), the "No Nonsense" amateur radio license study guides (KB6NU.Com/study-guides/), and one of the hosts of the No Nonsense Amateur Radio Podcast (NoNonsenseAmateurRadio.Com). When he's not thinking about operating maritime mobile, you'll find him on 30m, 40m, and 80m.



BOARD OF DIRECTORS MEETING MINUTES

March 8, 2019

The meeting was called to order by Orion, AI6JB promptly at 18:00 at Mel's Diner in Auburn. All board members but Jeff, KM6RGO and Mike, KK6GLP.

Officer Reports given, including Dustin, W6YUE announced he has extra card stock poster board for the taking for use in the HAMFEST.

COMMITTEE CHAIR REPORTS:

Webmaster Herb, KM6JBI reported that the Web looks good. He desires another person or two on the web page as a security. It was suggested that Michele, WH7QC do the honors. ☺ It was recommended that a back program for our web; however, Herb stated that he does back up on his own.

Social Media Officer (SMO)-Bob, K6UDA said he has no keys to Twitter, but can get with Mark. Suggested we set up an Instagram account. He will start it up for SFARC. Instagram can be done only by phone. Instagram can transfer directly to Facebook.

Membership Richard, Wa6RWS announced that there are now 94 paid members, 43 non-paid.

VE Exam Al, NI2U announced there was 1 Extra and 1 Tech newbies. There were 7 VE in attendance.

Contest Chair Dennis, WU6X announced CQW side band on March 30 & 31.

Nomination Committee Rich, AA6RS Has agreed to be the nomination chair for 2020. Thank you Rich!

Field Day Committee Herb, KM6JBI/Bob, K6UDA/Al, NI2U/Gary, KC3PO. They have a special Groups.io special account where they meet and discuss which has been very helpful in their decision-making.

Volunteer Events Mike, KK6GLP reported that the ARRL Sacramento Valley Section participated in the STEM Expo at William Jessup University on Saturday, March 2, with SFARC organizing the amateur radio booth. Other clubs participating were Western Placer ARC, River City ARC, and Samuel F. Morse ARC. Thirteen amateur radio volunteers assisted in the event, including five from SFARC (Michele, WH7QC read in behalf of Mike).

CALENDAR OF CLUB EVENTS:

March 16-HAMFEST and it looks like good weather, announced, Brian, AI6US (chaired by AI6US).

May 4-Crazy Miner Enduro, Georgetown, CA (chaired by KK6GLP).

May 5-The MS Walk in Folsom from 8-11 am and volunteers are needed, it was announced (chaired by KK6GLP).

May 5-Fool's Gold Motorcycle Enduro, CA (chaired by KK6GLP).

June 22-Field Day 2019 (chaired by Team).

July 20-ARL North American QSO Party-RTTY (chaired by WU6X).

August 3-ARRL North American QSO Party-CW (chaired by WU6X).

August 19-ARRL North American QSO party-SSB (chaired by WU6X).

September 13-Club Officer Nominations (chair TBD).

October 11-White Elephant Auction (chaired by W6TJR/K6UDA).

October 26-CQ Worldwide SSB Contest (chaired by WU6X).

November 8-Club Officer Elections (chaired by TBD).

November 22-CQ Worldwide CW Contest (chaired by WU6X).

December 7-Club Christmas Dinner (chaired by Pamela Bautista).

OLD BUSINESS:

Club Officer Duties Checklist Suggested (All).

Repeater lease expired on June 2018. We are waiting for the school to move forward. Letters have been written regarding the lease, but no move on the school's part (WA6RWS/K6BAA).

Financial Report 2018: Are there things needing cleaned up on? (KK6GLP/WU6X).

Field Day Site Selection Committee: Target decision by Jan/Feb 2019 up in Blue Canyon, and the Forest Service seems positive and next week will get back to us. There will be porta-potties and wash stations, announced Brian, AI6US.

Meritorious Life Membership Nomination: [George, KG6LSB who is to be handed a certificate tonight! Yay George! \(WA6RWS\)](#)

Club Meeting Camera Lighting Proposal-\$200: The light may be brought to General meeting tonight announced Brian, AI6US. There will be NO skrim purchased with this light as using one would lessen the view quality of those presenting (AI6US).

Repeater Upgrades Proposal: The Repeater is still up for proposal announced Bob, K6UDA.

Submitted by *Michele Bauer-WH7QC, SFARC Secretary*

GENERAL MEETING MINUTES

March 8, 2019



The SFARC General meeting for March commenced at 19:30 hours at the Auburn City Hall Rose Room, President Orion-AI6JB presiding. All officers and Directors were present, excepting Jeff Morgan, KM6RGO, who was out of town. The meeting began with its usual Pledge of Allegiance to the flag. An introduction of Officers, members and guests followed. There were 46 people signed up, including 2 visitors. Orion gave a special welcome to our guests and a mention to new members to be sure to get an Elmer if need, from Brian, AI6US.

George Simmons, KG6LSB was presented with a special Lifetime membership! Thank you George, for all your selfless service to the Club!

Individual reports were given, including Groups.io Site report by Dennis, WU6X who mentioned the site now having 120 members.

George, KG6LSB reminded us that the refreshments donation go to the annual SFARC Christmas party. This year's event is scheduled for 7 December, 2019.

Doug, KM6QET displayed a lot of nice variety of items for the drawing and also reminded us that the drawing proceeds go towards the Christmas party.

Rich, AA6RS is now the official head of the Nomination Committee Thank you Rich!

Jim, WA8MPA had the Show & Tell Table/Library as usual. Thank you Jim!

CALENDAR OF CLUB EVENTS:

March 2--STEM Expo, William Jessup University was a great event! Reported Mike Perry, KK6GLP.

March 16--HAMFEST, the 5th annual, to be held at the Historic Loomis Train Depot. Brian, AI6US reported that last year there were 530 reported in attendance. He added that it will be like a HAM swap meet, beginning at 7:00 am and finishing by noon. There will be awesome door prizes, the Grand prize being the Yaesu FTM 400. There will be a test table run by Richard, WA6RWS, an Elmer tour, and presentations. Sounds like fun!

May 4--Crazy Miner Enduro in Georgetown (chaired by KK6GLP).

May 5--MS Walk in Folsom (chaired by KK6GLP).

May 5--Fool's Gold Motorcycle Enduro (chaired by KK6GLP).

June 22-23--Field Day 2019 will be held up at Blue Canyon Airport. There is a great view down to Auburn. It is also a better VHF location, low RH noise and a flat surface. We have free use of the site and there will be porta potties. We will keep the group centralized (event chaired by the TEAM).

ANNOUNCEMENTS:

Club Nets-Every Thursday @7:30 pm (145.430, PL=162.2).

Elmer Net-Every 1st & 3rd Wednesday @ 7:30 pm (145.430, PL=162.2).

Club Board Meeting-2nd Friday of the month, 5-8-15 7:30 pm.

Club Breakfast-Last Saturday at Mel's in Auburn

PROGRAM: (Organized by Brian, AI6US)

Dennis, WU6X gave a presentation on COAX. Solder step by step with a slide and live demonstration. Dustin, W6YUW gave a presentation on CRIMP installation. He prefers shrink tubing with glue inside. He also gave a step by step CRIMP demo. Both demonstrations kept the audience tuned in!

The meeting adjourned at 21:00 hours with a reminder to everyone about the HAMFEST and the Show & Tell.

Our next monthly meeting will be held on April 12, 2019.

Submitted by *Michele Bauer-WH7QC, SFARC Secretary*




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Laser Generated Antennas

Tired of ungainly fixed-dimension antennas that require unsightly and expensive towers and support structures? With breakthrough LGA technology, your antenna automatically adjusts itself to match frequency and propagation requirements—and no tower is necessary!

Not since the invention of the transistor by Bell Laboratories more than 50 years ago has the electronics world been rocked by such a landmark invention. We stand on the threshold of a new millennium of computer-aided communication electronics with the recent development of Laser Generated Antenna (LGA) systems that offer the ability to transmit radio-frequency energy over laser beams that function as antennas. Yes—it's right from the pages of a Buck Rogers adventure!

Several months ago, while on a business trip to Sweden, I was able to visit Lars Bresden, an old university friend and owner of Teragram Labs. He was kind enough to give me the grand tour of his facilities. The research work there boggles the mind. What started out as

basic research on cold fusion serendipitously blossomed into this new miracle technology. His company is now involved in qualitative research of the discovery.

Teragram Labs is pioneering antennas that operate via laser beams. The frequency range is virtually unlimited. Many frequencies and configurations are being tested, and the results are promising as well as astonishing. Although commercial production is still a long way from becoming reality, the technology and materials are available to accomplish what seems to be the impossible. Several prototypes are being earnestly evaluated. Radio amateurs will pioneer this new technology.

Again, the Black Box

The prototype of electronic wizardry that I was shown is about the size of a telephone book (see Figure 1). As far as I could tell, the box consists of two sections. The first, the heart of the system, uses a microprocessor to control all functions. A second chip is part of a redun-

dancy circuit. The second section generates the laser element(s) through a series of fiber optics circuits, along with the use of micro-mirror relays (see Figure 2). Users do not observe the "skin effect" with an LGA (common with ordinary coax). The way the director and driven elements are generated is pure applied science fiction. I really don't understand all that I know about this.

When I asked about how the system worked, Lars just smiled. Without giving a hint about this new technology, he said that the LGA functioned as an automatic tuner, as well as an amplifier. As you dial in the desired frequency on your transceiver, the black box automatically generates a correctly sized antenna for that frequency, thereby providing an SWR of 1:1. You get a new element each time you change frequency.

The laser element(s) are sent through special connectors (see Figure 3). Some fittings are articulated so they can be adjusted for just about any configuration (vertical, sloper, dipole, multielement beams, etc).

There is no discernable attenuation from nearby objects, and the elements can take the excitation power and increase it by a factor of 0.05. This is too good to be true. There are still some technical bugs



Figure 1—I surreptitiously grabbed this photo of the LGA prototype control box. Ugly construction at its finest.



Figure 2—A view of the LGA micro relay housing.



Figure 3—One of the more exotic components of the LGA: An antenna fitting designed to emit laser beams!

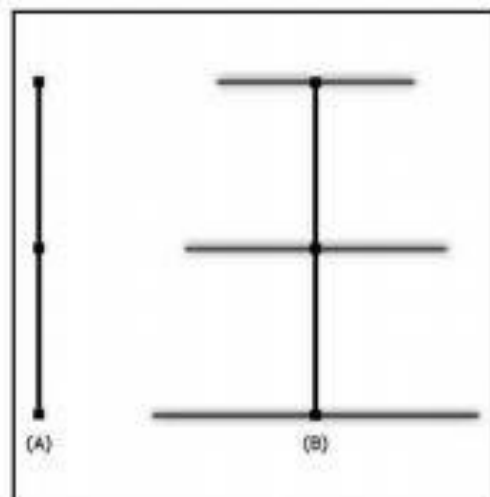
that must be worked out. So far only QRP power has been used. Eye protection is paramount and all laser safety precautions are in effect.

Lars let me sit at the controls of a Kenwood TS-570 that was set up in the lab, and in just a few minutes, running only 10 W, I was able to work three stations on 20 meters. The most distant station was approximately 1200 miles away. The LGA nozzles were configured as a dipole only 25 feet high, just outside the lab window.

Although the grounding system is still a mystery, actual operation—transmitting and receiving—was indescribable.

Pandora's Box?

The possible uses of this new technology opens doors to applications that, until now, have been out of reach. Weather will never affect antenna systems ever again! Neighbors won't complain about unsightly yard structures. The people involved in stealth technology can combine this with spread spectrum



An artist's conception of the LGA in action. Before the lasers are activated, the only thing visible is the boom (A). When the beams fire, elements of pure photonic energy appear automatically (B).

techniques and really become invisible!

According to Teragram Labs, we should see the first LGA Amateur Radio systems reach the market by next April.

You can contact the author at 804 Guidroz St. Franklin, LA 70538-4609; wa5qhv@arrl.net. **QST**



SIERRA FOOTHILLS AMATEUR RADIO CLUB
P.O. Box 6421, Auburn, CA 95604

2019 MEMBERSHIP APPLICATION

Name: _____ Call: _____ Class: _____ e-mail: _____
Address: _____ City: _____ State: _____ Zip: _____
Associate Name: _____ Call: _____ Class: _____ email: _____
Phone: _____ Cellphone: _____ Application is: (New / Renewal) _____

Dues / Donations:

Membership: yearly* \$22.00 or 20x____ Name Badge: \$ 10.00/15.00 Yes (special name) _____
Associate: yearly* \$ 7.00 Repeater Donation: \$ _____
Auto Patch Donation: \$ _____ Newsletter Booster: \$ _____
Misc. Donation: \$ _____ Christmas Donation: \$ _____ ARRL member? (Yes/No/Life) _____
TOTAL: \$ _____ Please add \$1 if paying via PayPal

*Prorated dues for NEW Members/Associates Only

July	\$ 20 /6	October	\$ 14/3 + following year
August	\$ 18/5	November	\$ 12/2+ following year
September	\$ 16/4	December	\$ 10/1 + following year

New - - - New - New -
Multi-year DISCOUNT Membership
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