



August 2015

ARCO *vet*

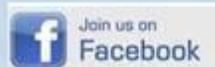
A Community Service Organization Dedicated to Amateur Radio Since 1970

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E-mail: W6SBA@arrl.net



Website: <http://www.w6sba.org>

We had a great picnic last month. Eighteen club members and families feasted on hotdogs and chips. Rob, KB6KMX, did a brilliant job of bar-b-queing the wienies. Thanks Rob! The only complaint was that we had no Ketchup. Well, maybe next year. Our activity was a fox-hunt as described at our last club members. Two "foxes" hid themselves well until discovered by clever club members. Thanks to Bruce, KK6BJ, and Tom, KI6RC, for providing the fox transmitters and hiding them. We had planned to stay at the park until 3:00 or so but the skies decided to start dropping water around 1:00 so we packed up and went home. A good time was had by all.

Our next big club activity is Hamcon which takes place on September 11th through the 13th at the Torrance Marriott Hotel on Hawthorne Blvd. Your Council member Jerry, KJ6JJ, is in charge of the activity. As you are probably aware by now, we are responsible for the W1AW station and the "call-in" station which is used to guide amateurs to the hotel where the event is held. This means that we need people during operating hours to check in operators and to operate the radio when none of the convention attendees is using the station. Many people want the chance to talk to W1AW and get a QSL card for doing so. In addition to this, we need folks to help move equipment from Joe's QTH to the hotel Friday morning and to help set it up and then to take it down and return it to Joe's Sunday afternoon. This will be a far easier task than was Field Day but we still need workers for set-up and take-down. W1AW will be operating from about 11:00 Am to 7:00 PM on Friday, from 8:00 AM to 7:00 PM on Saturday, and from 8:00 AM on Sunday until noon. So, besides set-up and take-down, we need people to man the station. We would like to have two hour shifts but we will probably not have enough volunteers for that so shifts probably be four hours long. We need at least two people for each shift so that means that we need a minimum of twelve people to operate the station. I've done it at the past few Hamcons and it is surprisingly fun. So, expect some serious arm twisting at this month's meeting as we must operate the station during its open hours.

The year's last major activity is the Boy Scout Jamboree on the Air (JOTA) event in October. Details are still not clear as to exactly what we are doing for the event so stay tuned for this one. It's always fun to introduce the boys to HAM radio and our hope is that some of the boys will eventually get their licenses. So, stay tuned for more information on this. That's all for this month. I'll see you all at the next meeting.

Alan

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August 20th - 7:30 p.m.

**Torrance Memorial Med Center
West Tower, 2nd Floor, Room A**

The August SBARC meeting will feature Jerry Cook, KJ6JJ who will be giving a presentation on SRD, software defined radio.

His talk and discussion will be with an emphasis on the repurposing of small, inexpensive dongles- interfaces that allow computer processing to decode the many embedded digital signals, as well as the voice and other information encoded in all commercial radio. These devices and programs are what have expanded the breadth and scope of amateur radio over the last several years as PSK 31 and many other Digi modes have been introduced to our hobby.



Jerry literally has ham radio in his blood, having first been introduced to the hobby many years ago by his uncle Bud (W9OER-SK) who showed him the miracles of CW, the original digital mode, and then later by his son (KJ6YKG) with whom he passed his General Examination on the same day.

Jerry has been a member of the SBARC for several years and is a councilmember. His background in RF engineering has extended into the full breadth and depth of computer network interfacing and his interest and enthusiasm will be evident at our club meeting.



- 1) Suppose a runner goes up a two mile hill and turns around and runs back without pausing at the top. His average speed for the trip is 10 miles per hour. How long did it take him to do it?
- 2) 100 people were tested for ball throwing accuracy. 30 could throw accurately with their left hand and 10 could throw well with either hand. How many could throw well with their right hand?
- 3) What has 3 feet and nothing else?
- 4) Billie was born on December 28th, yet her birthday always falls in the summer. How is this possible?

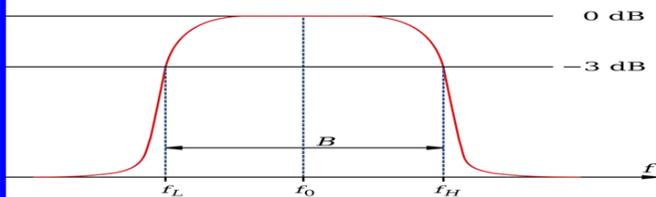
Answers to July's Quiz

- 1) If 6 people can make 40 widgets in 6 hours, how many can 3 people make in 12 hours? **If 6 people can make 40 widgets in 6 hours, then 3 people can make 20 widgets in 6 hours. So, if they work twice as long, the 3 people make twice as many widgets. The answer is 40 widgets.**
- 2) I had 20 dollars but all but \$6 was stolen. How much did I have left? **If all but 6\$ was stolen, I have 6\$ left**
- 3) What is the next number in this sequence: 2, 5, 5, 4, 5, 6, 3, ? **There are many answers to this question for which the reader could give a valid justification. The one I was looking for is the number of lit segments on a standard 7-segment numerical display. So, for the number "1", 2 segments are lit; for the number 2, 5 segments are lit and so forth. The next number in the sequence is "8" for which all 7 segments are lit. The answer is 7.**
- 4) How many outs are there in a baseball inning? **There are 3 outs in each team's half of the inning so the answer is 6.**

Please send answers, questions or comments to Alan at thermic72@sbcglobal.net

August RF Filters: Part 6

First, a quick refresher. Inductors pass low frequencies while capacitors pass high frequencies. So, if you see a filter (or part of a filter) which has the inductors going to ground, the filter passes the high frequencies. Conversely, if the capacitors are grounded, the low frequencies are passed. This month we are going to begin looking at “band-pass” filters which pass frequencies between two specified frequencies. When we discuss band-pass filters we specify a center frequency and a band width or we could specify the low and high “cut-off” frequencies which bound the band-pass region. Figure 1 shows a band-pass filter.



In the figure “b” indicates the bandwidth, f_0 is the center frequency, f_L is the lower cutoff frequency, and f_H is the high cutoff frequency. The 0 dB line is the maximum amplitude of the signal in the band-pass region. The -3 dB line indicates the point at which the signal has dropped 3 dB from its peak. These are the points used to define the lower and upper cutoff frequencies.

Now that we have defined what a band-pass filter is, it would be nice to look at some. Unfortunately, to do that, we must first discuss the concept of resonant circuits. Since the emphasis of this series is on filters, I am only going to discuss the basics of them without going into the theory of how they work. A resonant circuit is one containing an inductor and a capacitor. They may be in series or in parallel. Their “resonant frequency” is defined to be that frequency where the reactance of the inductor equals that of the capacitor. So we set:

$$X_L = 2\pi fL = X_C = 1 / (2\pi fC)$$

And solve for f . Remember that X_C means capacitive reactance and X_L means inductive reactance. This gives us $f = 1 / (2\pi \sqrt{LC})$ where f is the frequency in Hertz, L is the inductance in Henrys, and C is the capacitance in Farads. For radio

amateurs it is easier to use the formula $f = 10^3 / (2\pi \sqrt{LC})$ where f is in megahertz, L is in microhenrys, and C is in picofarads. Figure 2 shows a series resonant circuit.

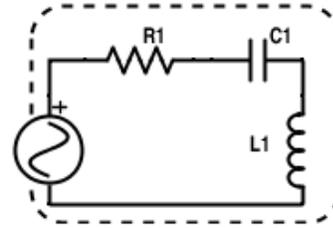
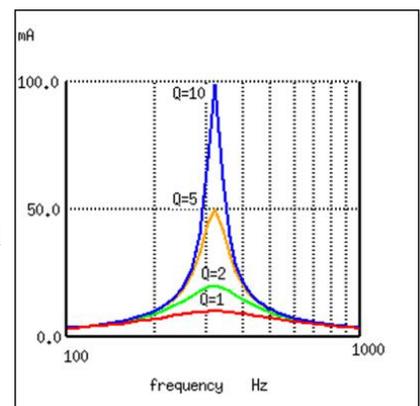


Figure 2

At resonance, the inductive reactance and the capacitive reactance cancel each other out so that the only resistance in the circuit is due to $R1$. Moreover, the current and the voltage are in phase. If the frequency moves away from resonance, the reactive factor begins to be significant and the current goes down. How fast the current goes down depends on the ratio of the reactance to the resistance. If the reactance of the inductor or capacitor is more or less equal to the circuit’s resistance, the current decreases rather slowly as the frequency moves away from resonance. Such circuits are said to be “broad”. If instead the reactance of the inductor or capacitor is a lot bigger than the resistance of the circuit, the current decreases rapidly as the frequency moves away from resonance. A circuit like this is said to be “sharp”. The ratio of reactance to resistance is called the circuit’s “Q”. So $Q = X_C / R = X_L / R$. Figure 3 shows a circuit’s response to several different values of Q . A Q of 1 means that reactance of either the inductor or the capacitor is equal to the circuit’s resistance. This gives a broad response of current to frequency. A Q of 10 means that the circuit’s X_C or X_L is ten times as great as the circuit’s resistance. This gives a very sharp response. Looking at the figure you will see why the response of the circuit is called “sharp” when the Q is high.

That’s about all the space I have for this month. Next month we will discuss resonance a little more and eventually we’ll get back to filters. I should note that I borrowed from the 2010 edition of the ARRL Handbook for this month’s discussion. Send comments and questions to Alan at thermic72@sbcglobal.net



Amateur Radio Users Help Scientists Study Space Weather



F5VIH. KM3T. PY1NB. These strings of letters and numbers aren't license plate numbers but call signs. They belong to a handful of Ham radio operators, just three of the more than 2 million amateur enthusiasts whose chatter fills the global airwaves day and night. Now, research suggests these communications may represent a vast trove of data that could help scientists study and monitor space weather.

Space weather encompasses the phenomena that occur in the ionosphere — the outermost layers of Earth's atmosphere — arising from the sun's activity and its interactions with the planet's magnetic field. Disturbances, like the geomagnetic storms that light up aurorae, can disrupt communication systems and GPS networks, while strong events like solar flares can threaten spacecraft, satellites and even terrestrial power grids.

Space weather also affects Ham radio signals. "Ordinarily, radio waves — like light — travel in straight lines, but they are affected by the medium in which they propagate," says [Joe Taylor](#), a Nobel Prize-winning astrophysicist at Princeton University and a lifelong Ham operator who goes by the call sign K1JT and was not involved with the new study. "If they are moving through the atmosphere, they can be refracted or reflected in the same kinds of ways that ordinary light can."

In fact, the short-wave frequencies used by Hams, which range from 3 to 30 megahertz, bend so much that they actually come back to Earth — that's how a user in the U.S. can say hello to a friend in Australia. But just how much these radio waves bend and how far they propagate depends on their frequency and the amount of ionization in the upper atmosphere, which in turn depends on space weather.

Generally speaking, more ionization enables better signal propagation, but during extreme events, like when a solar flare temporarily blew away the ionosphere on May 13, 2013, communication can be cut off entirely.

One of NASA's Geostationary Operational Environment Satellites (GOES) documented this event, but [Nathaniel Frissell](#), a space scientist at Virginia Tech and lead author of the new study, wondered if he could also detect the flare in archives of Ham radio transmissions. So, he looked at data from the [Reverse Beacon Network](#), a grassroots organization that catalogs all radio transmissions received at a web of listening stations scattered around the world. (The call signs listed at the

beginning of this article belong to some of the Network's founders, a group that also includes N4ZR, W3OA and VE3NEA.)

Frissell found that although radio propagation conditions were strong before the solar flare, permitting communication between Europe and South America, for example, the number of calls dropped precipitously right after it struck. Frissell, also a Ham enthusiast since his teens, says this illustrates how amateur radio networks can be used to monitor space weather and augment existing scientific observation networks. (Full article found at <http://www.earthmagazine.org/article/amateur-radio-users-help-scientists-study-space-weather>)

Most info in the article is basic for you experienced hams, but I liked it; shows how what we do helps in the world — Glenda, KF6QFE

FCC Announces Enforcement Bureau Field Office Reorganization Plans



Forced under political pressure to take a few steps back from its initial proposal to eliminate two-thirds of its Enforcement Bureau field offices, the FCC has announced its final, scaled-down plan to reorganize its field resources. In an *Order* released July 16, the Commission said it would close 11 of its 24 field offices and relocate three others to nearby FCC-owned sites. In slimming down its field resources and upgrading those that remain, the FCC said it was acting in the name of efficiency and economy as well as to modernize a system model adopted 2 decades ago. "Since then, technological changes and increasingly limited resources have created the need to take a fresh look at the [Enforcement] Bureau's field operations," the *FCC Order* said. The FCC said it has completed "a full review" of the field organization and concluded that it needs to concentrate its field resources "in urban areas, where the need for them is greatest."

ARRL CEO David Sumner, K1ZZ, addressed the topic of the FCC's planned field office closures in his "It Seems to Us" editorial in the August edition of *QST*. "The challenges the FCC faces in policing the radio spectrum are greater than ever and increasing every day," Sumner wrote. "Now is hardly the time to reduce its enforcement resources."

Sumner allowed, however, that the success of the FCC's enforcement efforts is not measured in the number of field offices but in the program's effectiveness in deterring bad on-the-air behavior and resolving interference complaints from such sources as power lines and "grow lamp" ballasts. [ARRL Letter, July 23, 2015](#)

Party Balloon Carrying Ham Radio Payload Circles Southern Hemisphere a Second Time

Bruce and Tom: Take notice!

After traveling for more than 110,800 km (68,696 mi) aloft, the record-setting pico balloon PS-46, carrying an Amateur Radio payload, completed its second circumnavigation of the Southern Hemisphere, before descending into the Indian Ocean on July 18 due to bad weather. The helium balloon and its solar-powered 25 mW payload were launched on May 23 by Andy Nguyen, VK3YT.

"It was an exciting but also an exhausting eight weeks for many hard-core trackers," Nguyen said. "Their perseverance ensured the balloon was tracked almost around the clock. It was hard work, and the little party balloon was becoming part of the daily routine for many of us."



A map showing the paths of PS-46, which had begun a third circumnavigation when it went down in bad weather.

More than 20 "regulars" were among those who tracked the high-altitude flight, monitoring the payload's 20 meter signals in *WSPR* and *JT9* modes. Stations in Virginia and Florida, as well as in Peru and Argentina were among those hearing the balloon's beacon.

The last station to hear the balloon was Vince, ZS6BTY, in Pretoria, South Africa. The balloon had been at an altitude of about 9000 meters (29,530 feet), but quickly descended into the ocean.

PS-46 had circumnavigated the Southern Hemisphere the first time in 12 days, and it was starting its third trip around when it went down. **Bruce and Tom: How far was it that your balloon traveled?** *ARRL Letter*, July 23, 2015

Inexpensively Made Satellite Closing in on 2 Years in Orbit and Still Ticking

At just a few months shy of turning 2 years old, the \$50SAT Amateur Radio "PocketQube" microsatellite -- also known as Eagle 2 (MO-76) -- is still operating, although it's not entirely well either. The satellite, which transmits on 437.505 MHz at a power of 100 mW, may be heard using a handheld transceiver, but it does not include a transponder. Launched in late 2013 from Russia, \$50SAT is a collaborative education project of Prof Bob Twiggs, KE6QMD, of Kentucky's Morehead State University, and three other radio amateurs -- Howie DeFelice, AB2S; Michael Kirkhart, KD8QBA, and Stuart Robinson, GW7HPW.

Formerly of Stanford University, Twiggs and Jordi Puig-Suari of Cal Poly are the co-inventors of the Cu-



beSat model. \$50SAT's stated purpose was to evaluate if the PocketQube form factor offered a cost-effective means for engineering and science students to use in developing real-world skills. The "\$50" is a bit of a misnomer. The tiny satellite actually was constructed from about \$250 worth of parts. Kirkhart recently offered an update on \$50SAT, which measures just 5 × 5 × 7.5 cm and weights 210 grams.

"The good news is [that] it is still operating. The bad news is the power situation has been degrading, with an apparent step change on or near May 12, 2015, followed by another on June 23, 2015," he recently posted. [ARRL Letter, July 16, 2015](#)

HAMCON2015

The ARRL 2015 Southwestern Division Convention returns to the Los Angeles area and explores Amateur Radio's second century.

September 11-13, 2015



1. **Attendance drawing:** We had a winner. Jerry-KJ6JJ was the winner of the July meeting drawing. The kitty was 25 dollar which he promptly received from Joe. Congratulations Jerry. The August drawing will start all over with 20 dollars. Will you be the lucky one? Remember, you must be present to win and a member in good standing.
2. **New member:** We wish to welcome Bill-AF7OO or as he likes to say double O backwards 7. Welcome Bill and thank you for joining us. We look forward to be working with you and benefit both ways from your experience in HF and other modes of operation. His interest is in both HF, VHF and UHF. Antennas/ propagation and public relations. Club activities he wants to participate in Field Day and club meetings. Thank you again Bill for joining us.
3. **Field Day Score:** Yes I am sorry for not being able to publish this to you earlier. Score wise we did not do all that good. 3 CW, 22 digital and 180 phone contact which gives us the claimed QSO score of 460 points for our 2A classification. We did pretty good on our bonus points, we claim 1050 points, which helps a lot of course. All and all not too bad of course. A lot of hard work went into this and when it was all said and done again we had a good time. Special thanks go to a lot of people, Ed-KN6JN, XYL Blair and friend Kathy for their great breakfast meal. Both lunch and dinner had been set up by Joe-WB6MYD. No I did not cook or prepare but subway and Costco were the lucky ones. Lot of other guys and gals were involved as well of course. We thank Ron-KD6EDV and sons, Cliff-KI6HZN and Andrew-KI6HJM for working with us as well. They have been part of our field day for the last 3 years now or maybe even 4. Bruce-KK6BJ for all his work regarding publicity which we hope to show you at our next meeting. Thanks Bruce. Behind the scene provisions was all done by Joe-WB6MYD such as getting the go ahead with the hospital, Tables and chairs, Security and the use of their rest rooms. Lot of the equipment to was made available and support as always very much appreciated. Thanks to Jerry-KJ6JJ for all his hard work in providing for and set up of the logging network. While he also was required to do that he had to turn all that stuff into Joe for

certifying and delivering to ARRL which was done by Joe. This made for a lot of work for actually too few a people to be doing all this work. Chuck-K6CSH had picked up a van to haul the equipment around and was also available to set up the table and chairs for all our enjoyment. We to have to thank both Bruce-KK6BJ and Alan-KG6ZPL for organizing this year's 2015 Field Day and due to the limited supply of helpers available had to carry the extra load. It was by all means very successful as well enjoyable. Thank you one and all (I know I forgot to mention a ton of people) you are all our hero's for all your hard work and perseverance in what was certainly a great Field day event for the SBARC.

4. **Thank you:** We thank Joe Moel-K0OV for his excellent presentation on "Transmitter Hunting" and Radio direction finding. He certainly is the expert to tell us all about that part. We were also given some excellent tips of course on the art of transmitter hunting or fox hunting. This came in handy since we had the picnic following this presentation. Nothing like telling and showing all the good tricks a week prior to our own activity in that. This certainly was an excellent presentation and was enjoyed by one and all. Thank you Joe it was very much appreciated.

5. **Picnic:** While unfortunately unable to attend myself due to a meeting conflict that day it was a great success. It was attended by about 18 club members and plenty of food and hotdogs were available to feed to most inner needs satisfied. The weather as we know turned little on us and stopped the activity of fox hunting. but some success was had by a few participating in this. Both Tom-KI6RC and Bruce-KK6BJ made it fun to have at least 2 small little transmitter hidden out in the park for them to be found. All in all a good event. Thanks to Tom, Bruce and Jerry-KJ6JJ for setting this up and while the weather caused it to end a little early it was still an very successful event. Thank you to Rob for being the chef and other to get the supplies over there and such. Thank you all.



CALENDAR

Council Meeting - 1st Wednesday of the month
Call Joe - WB6MYD (310) 328-0817

Club Meeting - 3rd Thursday of the month
August 20, 2015 - 7:30 p.m.
Torrance Memorial Med Center
West Tower, 2nd Floor, Room A

Club Nets - **W6SBA WEEKLY NET**
Every Thursday @7:30pm
(except the night of club meetings)
PVUSD EMERGENCY NET
1st Tuesday of the month
09:30 Hours on the W6SBA repeater

TRW Swap Meet Saturday,
August 29, 2015 , 7-11 a.m.

VE Session - Contact: Joe WB6MYD
Phone: (310) 328-0817
jmlanphen@gmail.com or w6sba@arrl.net

Social Event - Contact: Joe WB6MYD
Phone: (310) 328-0817
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CLUB SERVICES

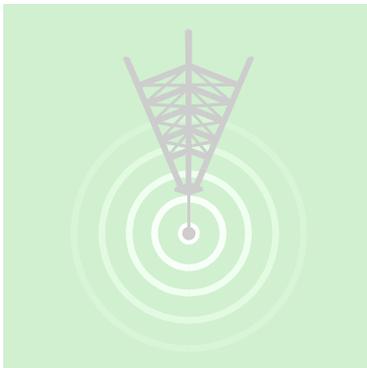
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Health & Welfare	Joe - WB6MYD
Swap Meet Chair	Joe - WB6MYD
VE Test Liaison	Joe - WB6MYD
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South Bay Amateur Radio Club Repeater
224.38 MHz · PL - 192.8 Hz Offset -1.6 MHz
(See Calendar for Weekly Net Times)

NEWSLETTER SUBMISSION

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