



**SAN BERNARDINO MICROWAVE SOCIETY, Incorporated**

FOUNDED IN 1955

A NON-PROFIT AMATEUR TECHNICAL ORGANIZATION DEDICATED  
TO THE ADVANCEMENT OF COMMUNICATIONS ABOVE 1000 MC.

# San Bernardino Microwave Society Newsletter

## Tech Talk for the February 4th Meeting

Our February speaker is SBMS's most often winner-on-points, Wayne Overbeck N6NB.

Photographic drone helicopters are exploding in popularity.



One manufacturer sold about a million "quadcopters" in the U.S. alone in 2015. What does this have to do with microwaves? They use the 5.7 GHz band to send high resolution video from the vehicle to the ground video display or even a head mounted display. The RC-to-aircraft control link is the 2.4 GHz Wi-Fi band.

**Come and join SBMS at the Meeting this Thursday, February 4th at the American Legion Hall, Corona: 11th and Main (See map below.)**

If you can't make it: watch online through Gary Heston's mobile video facility W6KVC by way of the internet out of England:

<http://atn-tv.org/live>

## **Activities at the January 2016 Meeting of the SBMS**

**(that would be of interest to the General Ham Radio Community)**

Presiding: Vice President Brian Thorson AF6NA

(18 in attendance... 17 last month)

### **Guests Or Members Not Seen In a Long Time**

- No Guests

### **ATV and online checkins**

No check-ins, but there was one guest on the BATC.

The link to Santiago peak is not active this evening due to a chance of rain getting the local equipment wet. The link to internet with video is active, however, and the meeting was also recorded on MPEG4.

### **Old Business**

- Dave Laag W6DL has done research on badge making machines, surveying several models in the \$275-\$600 range. Most models were available on E-Bay for around \$100. Dave plans to find a good one that makes round, 2-1/2 inch badges on E-Bay and acquire it. Original "W6IFE" artwork or the SBMS 60th anniversary logo artwork can be made available. New artwork will need to be produced for either design. All members who joined through MUD 2015 registration will get original artwork badges. A signup was passed around for those present also needing badges. Dave is working to have this completed in 60 days and expects that once the machine is here it can be completed in one evening meeting time.
- Walter Clark reported on nearby restaurants. Constenedas, which is on Sobrente Road 200 yards from the Sizzler where we usually gather before meetings and is accessible from 6th street, is something like Chipotle, similar to fast food with tables that could be rearranged for a temporary meetings space. The food was excellent. Dick suggested that rather than breaking up the routine the group just go somewhere else once in a while.

## New Business

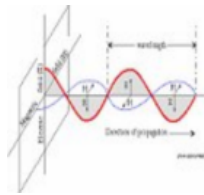
- President Chris Shoaff N9RIN was not present, but corresponded by phone to the meeting and suggested that SBMS should not have physical addresses of people's homes on the SBMS website. Frank Kroman AG6QV suggested that telephone numbers and e-mail should also be replaced with an online form people can use to contact the club so that we can then screen e-mails, noting that spammers have crawlers that scan for such information and sell it.
  - Mel Swanberg WA6JBD said that the Cactus web page has a contact form similar to this that distributes to several people and that it works well.
  - Courtney suggested an e-mail reflector address such as those supported at [callsign@arrl.org](mailto:callsign@arrl.org) and
  - Dave Laag W6DL added that as SBMS is an ARRL affiliated club and we should be able to do that.
  - Rein Schmit W6SZ, webmaster, asked for direction. Consensus was to remove all personal information from the SBMS website home page. Frank will help set up a forwarding tool. Dick also noted that people could send US Mail to our post office box.
  - 
  - [During break later, Marty Woll N6VI called Doug on his cellphone and arranged to set up [WA6IFE@arrl.org](mailto:WA6IFE@arrl.org) to forward to secretary [courtney.duncan@ieee.org](mailto:courtney.duncan@ieee.org).]
- Referring to a discussion that had originated online on the SBMS reflector, Doug Millar K6JEY suggested that with \$9000 in the bank we should just buy something to use as a 2.4 GHz beacon rather than try to build something up, a project that would take several years. Mel added that there were more beacon sites available through cactus than we could fill. Bill McNally N6MN suggested a motion that Doug come up with specifics and prices for 2304, 10, 24, and other appropriate beacons (but a formal motion did not result). Dave Laag and Doug Millar agreed to deal with this offline, with Doug to report to the SBMS reflector.
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Courtney Duncan (N5BF), Recording Secretary

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## Upcoming Events

- February 19 – 20” ARRL Southwestern Division Convention, Yuma AZ [www.yumahamfest.org](http://www.yumahamfest.org)
- March 3 SMBS meeting
- April 7: SBMS Meeting
- April 15-17, 2016, VHF Super Conference near Washington, DC.



### VHF Super Conference

Sponsored by Southeastern VHF Society, North East Weak Signal Group and the Mt. Airy VHF Radio Club. Hosted by the Grid Pirates Contest Group and Directive Systems and Engineering

<http://vhfsuperconference.com/>

- Add May 5 SBMS meeting
- Add May 7 CSVHF Microwave Spring Sprint (902 & Up)  
8 AM – 2 PM local
- Add May 7 – 8: SBMS 2 GHz & Up Contest

***For information on other events...*** see “Activities” in the SBMS **Website**, which, you should have memorized by now:

- Google SBMS
- click on our website
- then Ctrl-F Activities

# What Our Members Are Working On

- **Mel Swanberg WA6JBD (Upland)**  
put together a pair of surplus digital radios talking back to back. Plans a trip out to the desert this weekend to attempt a 90 mile Arizona to California contact.
- **Dave Laag W6DL (Marino Valley)**  
enjoyed the holiday party at Walter's house including the microwave activity that ensued when Walter and others brought out some of their equipment to play around with.
- **Bill Locke N6WL (Baker CA)**  
is still working on 10 GHz rig but not yet on the air.
- **Eric Fort AF6EP**  
just bought some up- and down-converters which hopefully he will check out over the next month after which he can get started on the microwave radio.
- **Bill McNally N6MN (Seal Beach)**  
now has a 6 foot solid aluminum dish with 4.5 F/D originally from Chuck Swedblom "WA6EXV" which has passed through Doug K6JEY and Jason WB6IEE. This means now Bill has a lighter dish of about the same size for which he is looking for a new home. The newly acquired dish is historic so it will not be trashed but it does need to be moved to a new home.
  - He is now focused on 2.4 GHz and 10 GHz in a parallel effort where both of which will have 144 MHz IF, feeding a single, dual purpose, sophisticated signal processing system. He is working toward the > 2.4 GHz contest.
  - Bill lives in a patio home without restrictions but doesn't have big space to do large antenna projects. His garage faces into an alley, however, that sometimes easily contains the track of the moon though there will be concern about irradiating the neighbors. He has an RF Safety meter from TRW Swapmeet and will compare it to Brian's.
- **Brian Thorson AF6NA Corona**  
activity this month was preparation of this evening's Tech Talk on measuring the performance of elliptical waveguide.
- **Courtney Duncan N5BF La Canada**  
moved furniture in the family room all day on New Year's Day to relocate the shack for the planned 1296 EME station and plans to be back on the air soon.
- **Jim Blum KK6MXP (Ontario)**  
spent time working Cactus. (The Cactus Intertie System is a private amateur radio system consisting of a large number of remotely controlled base stations,

that are interconnected utilizing full duplex links. It association with SBMS is that it is used during microwave contesting to organize the find of each other.)

- **Walter Clark** (Fullerton)

brought us up to date on his low cost phase detector for Dan Slater's method of antenna focusing. Last month he showed a setup that would measure focus at 2.4 GHz but what about higher frequencies? When working with phase you can locate the position of a null to a tiny fraction of a wavelength but to find the position of a 10 GHz feed requires a small antenna. Efficiency is not a problem here but he found sub-wavelength antennas have a serious problem with the coax they are mounted on becoming part of the antenna.

A balun is the familiar solution to that on a normal size antenna, but that is very difficult to do here with the exposed element only 3 mm beyond the shield of the coax. His Elmer suggested wrapping the coax with steel wool. Using this technique, he found indeed, only the exposed top 1/2" was sensitive. This should more than enough resolution to focus our 10 GHz dishes.



- **Doug Millar K6JEY (Long Beach)**

passed around copies of a Dubus magazine featuring a AD6IW developed solid state amplifier. Also showed around a 2304 preamp from G4DDK that covers the entire band with 24 dB gain and 0.30 dB NF with 295K at 2420 MHz. It doesn't have much selectivity. He acquired it for \$180 from G4DDK. He says these are the lowest noise figure preamps you can get.

- He (and Bill) are working towards the February 13, 2016 Dubus CW- and SSB -only EME event and will have a 7 foot dish based system for that (see above adventure). The septum feed and mount are finished and now the system is in the fine tuning stage. Everything is labelled and measured. He will split IF to feed Rein's receiver on the side. He has used the VK3UM planning program which uses nearly all relevant parameters and gives sun/moon noise, etc. He thinks he will be able to make a CW contact with a 30 Watt station. The big problem is Doppler rate meaning that the operator must run split.

Courtney Duncan (N5BF), Recording Secretary

## Special Trip Report by Bill McNally N6MN and Doug Millar K6JEY

on their excellent adventure to Texas to bring back some dishes from Kent Britain WA5VJB for their 2.4 GHz EME projects. Following a purchase of 2304 MHz preamps at MUD 2015 they had nearly everything needed for EME stations. They learned from Kent that he had several suitable dishes at his home in Dallas for anyone who would come get them. Doug and Bill flew to Dallas as soon as possible, rented a truck picked up from Kent's house all the parts for two brand new 7 foot mesh dishes with azimuth / elevation mounts and tripods, ready to go with all the pins and retainers and transportation packaging. Counting the flights, rental truck back across the southwest United States, and accommodations along the way, the whole deal was about \$1200, making the cost of each \$10,000 dish assembly about \$600 with camaraderie and adventure thrown in as a bonus. The California border agricultural inspector was mainly worried about fire ants on a vehicle coming from Texas.

## Tech Talk Last Month

At the January 7th, 2016 SBMS meeting, Brian Thorson AF6NA presented the test methods for insertion loss and reflected power on this waveguide. He also talked about insertion loss, waveguide propagation modes, frequency and wavelength considerations, "multi-moding," terminations, transitions and connections for waveguides.



## What Goes on in the Back of the SBMS Meeting Room



"Roland Hoffman - KC6JPG and Tom Board - WB6HYH (both from Rancho Cucamonga) are here in a pre-production discussion with Gary Heston - W6KVC (not pictured) during an ATV live remote for the monthly SBMS January meeting. Roland demonstrated the use of his equipment to live stream the meeting directly to the internet in the event the ATV repeater is down, or during inclement weather. Roland's digital television production system is extremely flexible, as it is capable to split broadcast both standard definition

(SD-480i) for transmission to the ATV repeater, and high definition (up to 1080p) onto the internet and the flat screen monitors simultaneously. Gary enjoyed using the digital system as he was switching the 3 cameras and monitoring the audio output using a WiFi tablet to control the system from anywhere in the room. You can watch the live broadcast of the SBMS meeting every first Thursday of each month on the W6ATN Santiago Peak repeater if you are have amateur video capabilities or on the BATC live video streaming system described below.



## Gary Heston's ATV Mobile Studio W6KVC

Not only can you watch our meetings live (well delayed by 240 milliseconds). You can chat with other viewers about what you are watching (or anything else).

**This is how to watch SBMS meetings from home:**

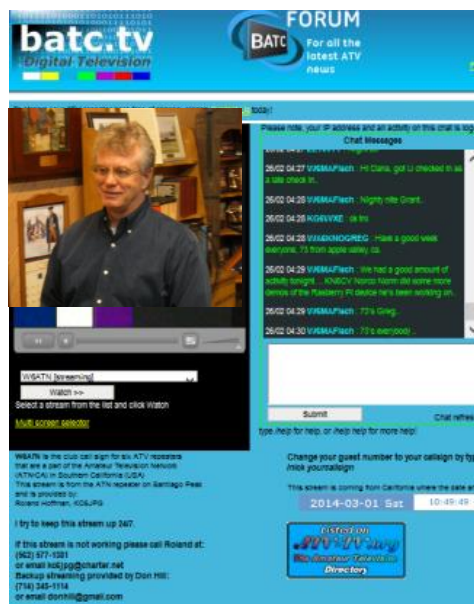
<http://atn-tv.org/live>

What you will see is this →

It's a British website (that's the B in batc.tv) You do not need to log in to be able to watch the video and participate in the chat. On the right choose "Repeaters" and then on the left, you have to pick a stream. The stream to choose is: **W6ATN**. This should be easy to memorize: W6 for California, then ATN as in Amateur Television Network.

W6ATN is the club call sign for eight ATV repeaters that are a part of the Amateur Television Network in Southern California. (ATN-CA)

Gary Heston's mobile studio beams its signal to the ATN repeater on Santiago Peak maintained by Mike Collis WA6SVT. From there Roland Hoffman, KC6JPG puts it on the internet by way of BATC.TV described above.



When Roland Hoffman is substituting for Gary Heston at the SBMS meeting, he streams to the internet directly by way of a mobile hotspot to a cell phone tower, thereby eliminating two lower bandwidth RF paths (SBMS to Santiago and Santiago to Roland's QTH).

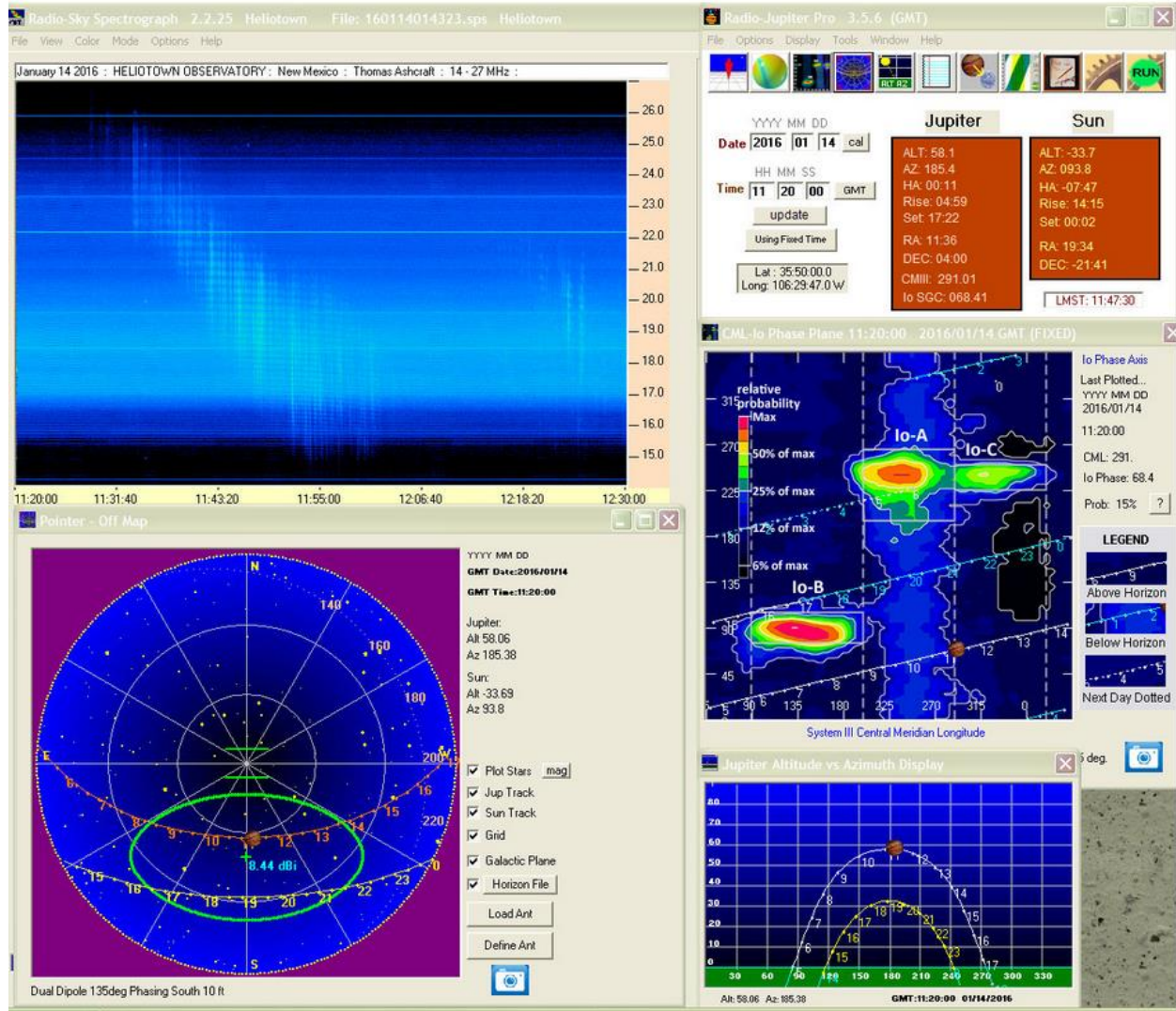
## Other Amateur Microwave Type Organizations

One is SARA, Society of Amateur Radio Astronomers and the other is Amateur DSN. Both are mostly active through group Email because there members are thinly spread out over the whole country. The only time they meet is once a year at a conference.

On the next page is an email report from SARA member Thomas Ashraft. The subject of the email was "[SARA] Jupiter Jan 14 2016"

The text reads as follows:

It is always pleasing to see what might have occurred on the spectrograph over night. Here is a well defined, either Jovian non-Io-A or perhaps likely a non-Io-C from this morning. Still to be analyzed. One hour duration storm.



Email notices like this from members arrive several a week. If there's some event (usually something to do with Jupiter), reports like this will be coming in from all over, many times a day. To see **SARA** email reports like these from amateurs like you with equipment that looks like yours but points up, visit this group at: <http://groups.google.com/group/sara-list?hl=en>

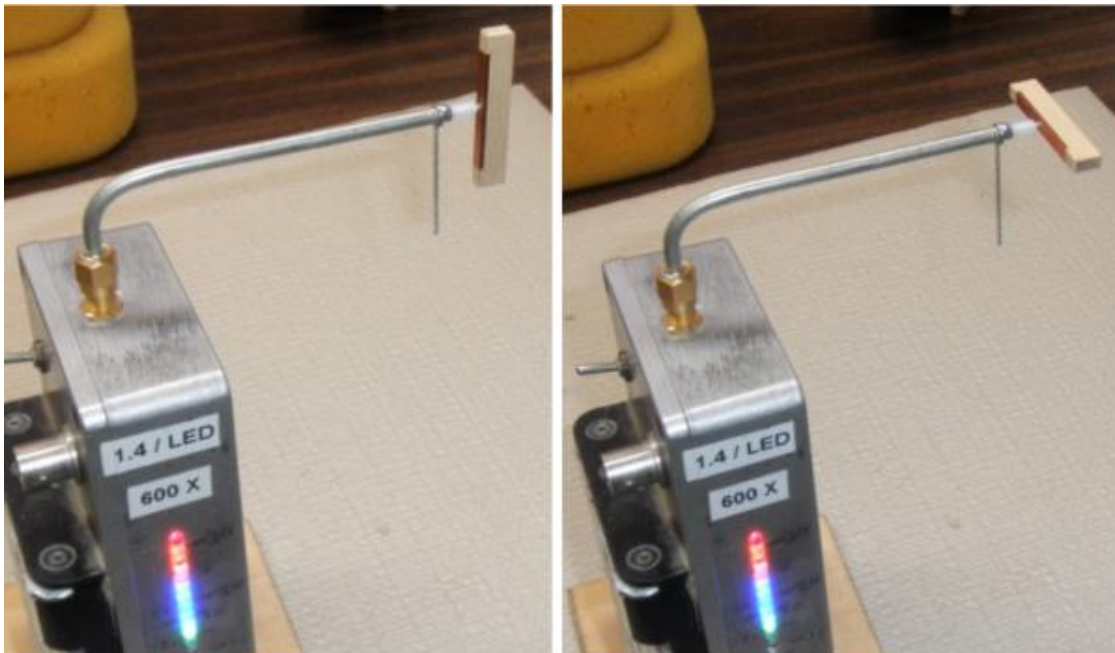
**Amateur DSN** is a group Email bunch of guys that also point dishes mostly up. But what they watch for are spacecraft leaving earth orbit for some interplanetary voyage. The challenge there is just being able to follow the carrier from the instrumentation package as far away as possible. To join that group go to: <https://groups.yahoo.com/neo> then in the Search window, enter: amateur-DSN.

# Electronical Mystery of the Month (instead of gismo)



The antenna on this field strength meter is about the correct size for the 2.4GHz signal it is bathed in.

The flat panel source on the right is vertically polarized yet both



**positions have exactly the same sensitivity. Why is that?**

If you can identify why, or would like to discuss this, use the SBMS Reflector by sending an e-mail letter to . . . [SBMS@lists.altadena.net](mailto:SBMS@lists.altadena.net)

If you don't have an account sign up at this website: [sbms@ham-radio.com](http://sbms@ham-radio.com)

## Needs, Wants and For Sale (Updated 4 December 2016)

- **For Sale from Bill Burns:** Bill will only rarely come to the meetings, so if you want any of this, please contact him by phone or email.

phone: 760-375-8566      email: [bburns@mediacombb.net](mailto:bburns@mediacombb.net)

His address is: 247 Rebel Road Ridgecrest CA 93555

- TVRO dishes 10 ft, 6 ft, and 5 ft      ← **free**
- Long lengths of heavy tower guywire with insulators      ← **free**
- Lengths of aluminum tubing, ½ inch to 3 inch diameters      ← **free**
- Earth screws for anchors of guy wires      ← **free**
- 1296 antenna 8 bays of 3 element Yagis \$10
- Pickup bed trailer with camper shell- licensed. \$250

## Member Ads

### Sixty North Electronics

Kits Made by member KL7UW

Let Ed Cole assemble your Down East Microwave kit. For kits in stock, he can deliver an assembled unit to your custom design preferences within 30-days of a paid order. **His prices are the same as you pay DEMI for an assembled transverter, but much quicker delivery time. And comes with 90-day written warrantee on labor (guaranteed to work)!**

Shipping for a transverter is typically that of medium-size flat-rate Priority Mail anywhere in the USA.

For examples of his work click on... <http://www.kl7uw.com/kits.htm>

Contact him at [kl7uw@acsalaska.net](mailto:kl7uw@acsalaska.net)

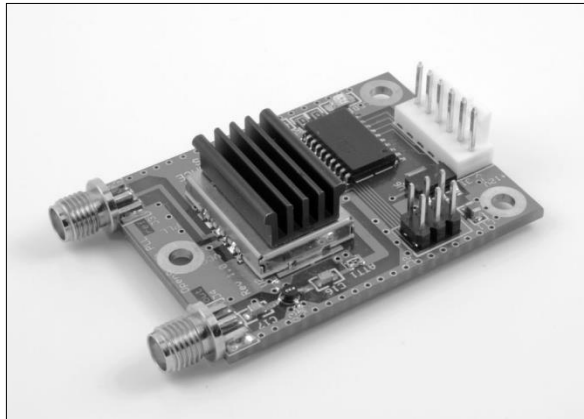
# REACTANCE LABS



Introducing the **OpenSynth** line of frequency synthesizer kits. Available in standard frequencies of 2556, 2952, 2160, 1152, 3312, 3006 MHz, also available from 400 MHz to 3500 MHz.

- ⤴ Low phase noise, Buffered output
- ⤴ Ultra low noise voltage regulators
- ⤴ Open Source code and design, made to be modified
- ⤴ 2" x 1.5", 12V @ 140 mA typical

Available at <http://reactancelabs.com>



If you are a member you can have a picture ad here yourself.  
For the time being this service is free.  
eMail the editor at: [WalterClark@roadrunner.com](mailto:WalterClark@roadrunner.com)

## About SBMS

The San Bernardino Microwave Society is a technical amateur radio club affiliated with the ARRL having a membership of over 90 amateurs. The focus of the club is microwave activities in the Southern California. ***Our sister club is San Diego Microwave Group (SDMG).***

### Official Address

**San Bernardino Microwave Society**

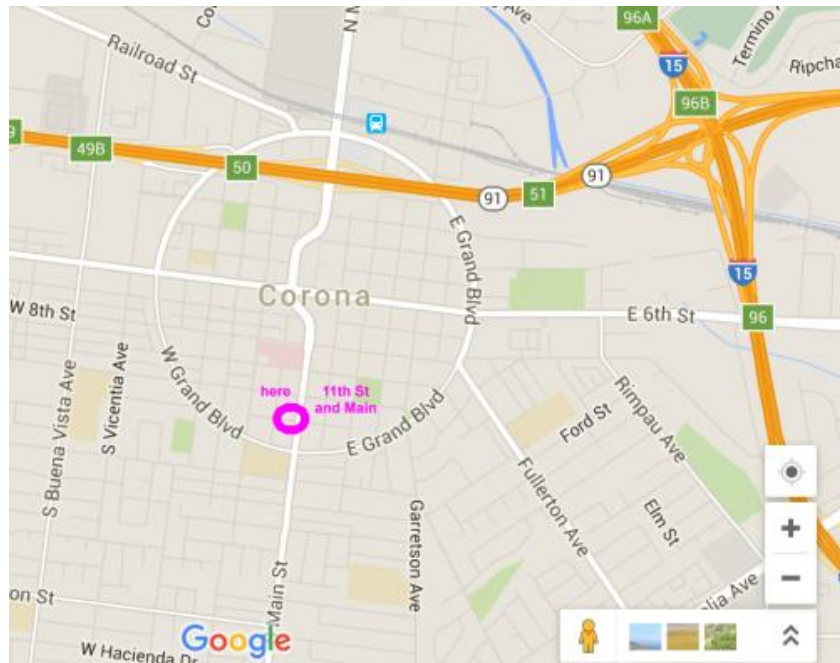
417 South Associated Road #146

Brea, CA 92821

SBMS dues are \$15 per year, which includes a badge and that's about it. The dues are more in the way of a donation to pay for outreach things such as video portals, a bank account, and rent for the building. When to pay is not a matter of remembering. The Corresponding Secretary will contact you by email and will then hound you like your own personal PBS telethon. Dues can be handed to the treasurer at the meeting, or mailed to the address of the treasurer listed in the banner below.

**Meetings are first  
Thursday of the  
month, 7:00 PM  
at the American  
Legion Hall,  
Corona.**

For carpooling from  
North Orange County  
call Dick Bremer at:  
714-529-2800



# Services Sponsored by SBMS

**Group Email; the Reflector: Dave Glawson WA6CGR** [wa6cgr@ham-radio.com](mailto:wa6cgr@ham-radio.com)

The most active method of information exchange is our group email called the SBMS Reflector. You don't need to be an SBMS member to participate. To subscribe fill out the form at the website: <http://lists.altadena.net/mailman/listinfo/sbms> After that, Send your email message to: [sbms@ham-radio.com](mailto:sbms@ham-radio.com). (If you are getting email on the SBMS Reflector now, and you want to write your own message, pull up a recently received message, click on "Reply to List." Don't forget to change the subject line and delete all previous text as appropriate.)

**Website: Rein Smit W6SZ:** [rein0zn@ix.netcom.com](mailto:rein0zn@ix.netcom.com)

The URL is: <http://www.ham-radio.com/sbms/> But you don't have to memorize that or write it down, just enter SBMS into any internet search engine.

**Newsletter: Walter Clark:** [walterClark@roadrunner.com](mailto:walterClark@roadrunner.com)

The newsletter is distributed by way of the SBMS Website: [www.ham-radio.com/sbms](http://www.ham-radio.com/sbms). The purpose of the SBMS Newsletter is to keep hams everywhere in the world informed on current activities of the "active" members of the San Bernardino Microwave Society. Active Members include those who:

- come to the meetings and share their progress
- use ATV to report in and describe their projects
- send by email words and pictures of progress to:  
[walterclark@roadrunner.com](mailto:walterclark@roadrunner.com)

## Contact San Bernardino Microwave Society (SBMS)

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email: [wa6cgr@ham-radio.com](mailto:wa6cgr@ham-radio.com)

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