SAN BERNARDINO MICROWAVE SOCIETY, Incorporated

FOUNDED IN 1955

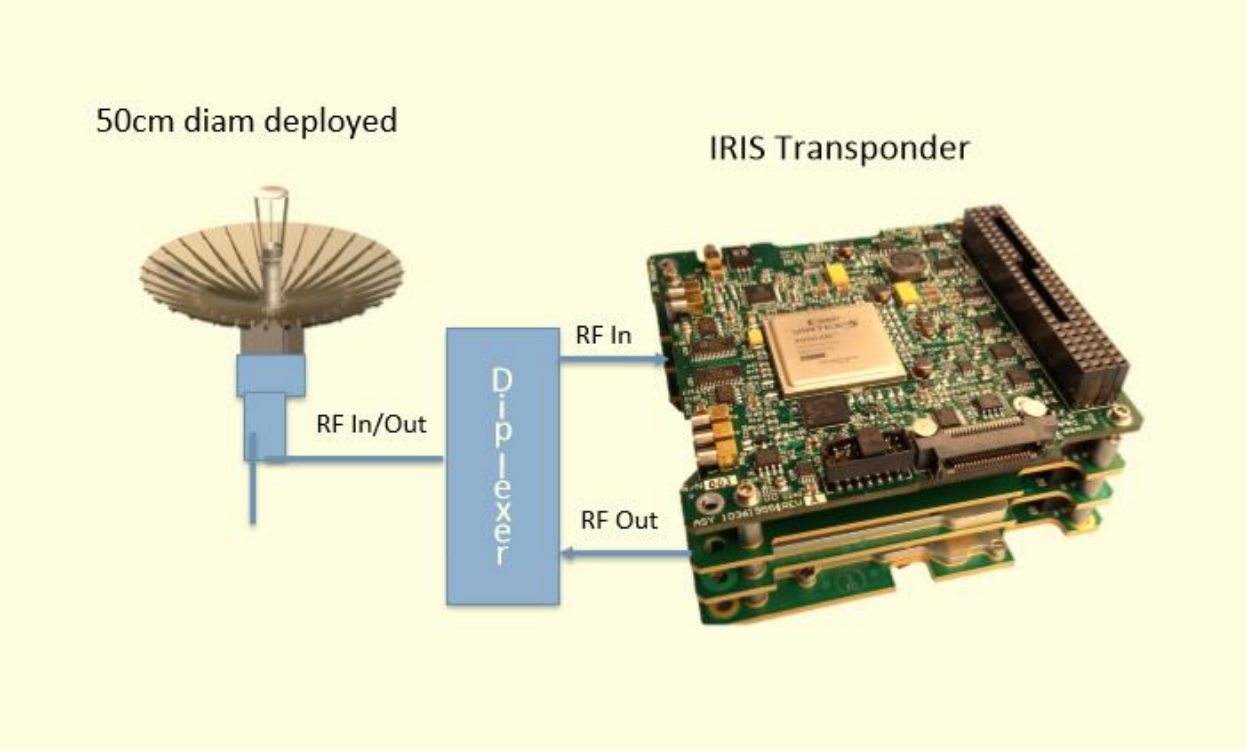
A NON-PROFIT AMATEUR TECHNICAL ORGANIZATION DEDICATED TO THE ADVANCEMENT OF COMMUNICATIONS ABOVE 1000 MC.

October 2014 Newsletter on the Activities of the San Bernardino Microwave Society

Walter Clark, Editor

Tech Talk for the October Meeting

Microwaves: Communications and Navigation in Deep Space … even in nano SpaceCraft by Courtney Duncan



Courtney Duncan, N5BF was first licensed as WN5GRZ in 1972 in rural central Texas. He first became involved with small satellites that same year when OSCAR 6 was launched.

He has been with NASA for 28 years including 27 years at the Jet Propulsion Laboratory - California Institute of Technology where he supervises the Reprogrammable Signal Processing Group of the Flight Communications Systems Section. Before joining the flight radios organization he had worked on software for science grade GPS receivers, software for optical interferometry systems, deep space navigation software, and flight hardware for the Shuttle Radar Topography Mission (mapped the earth in 2000) and the GRAIL gravity science mission to the moon (2009). Courtney has also served as an officer of AMSAT-North America and various amateur radio clubs.

His current interests include JT modes for space radio, particularly EME and meteor scatter, contesting as a trial for equipment, and 10 GHz.

Activities at the August Meeting of the SBMS
(that would be of interest to the General Ham Radio Community)

Presiding: Chris Shoaff (14 in attendance… 19 last month)

Old Business (Courtney Duncan, Secretary)

- 2304 beacon report:
  - Dick Bremer learned that Chuck Swedlom has the 10 G beacon functioning but that it needs an identifier.
  - Dick offered that SBMS would buy an amplifier for beacon if needed.
  - Dennis Kidder offered that an Arduino would be great for the purpose of identifying and controlling the beacon. (See tonight's Tech. Talk.)
- Dick Kolbly Plaque
  - Ed Munn (W6OYJ) had drafted words for the Kolbly plaque and sent them to Brian Thorson (AF6NA). Ed has material that goes back to the Rock Lock days. (Rock Lock was developed by George (W6NBL) in the 1960s trying to make contact from Barstow to Tommy Thompson's house. Did not succeed.)
  - Kolbly worked at JPL (Goldstone) and Lockheed. Mel Swanberg said Dick mentored a lot of guys here, taught a lot of fundamentals. Kolbly also worked for HyGain - HyTowers.

Upcoming Events Identified by Readers

- Oct 24-25, 2014 Microwave Update, Rochester, NY (Thank you Mark Casey, K1MAP)
- Nov 9-10UT and Dec 6-7UT 17 pm local 1.2GHz CW and digital. (Contact Doug K6JEY

Anyone, (not just SBMS members) . . . if you know of any future 1 GHz and above amateur radio event, please send date and description to the editor: walterclark@roadrunner.com

What Our Members Are Working On

- **Jeff Fort KN6VR (Phelan)**
  - working on family problems at home
- **Dennis Kidder W6DQ (Inyokern/Fullerton)**
  - tried getting in on the contest. Heard only Pat Coker; problems with liaison radio.
  - He suggested to "be" a beacon on Omni when working from home.
  - **Walter Clark (Fullerton)** brought some tiny WiFi transceivers he proposes to become proficient using in the next few months. This will be for data transmission from R/C planes.
- **Jason Sogolow W6IEE (Burbank)**
  - stuffed 10 lb of modified surplus radio into 3 lb box. 10 GHz 300 mW. goes click click click when it's supposed to. A suggestion from the members was to put a waveguide switch on the dish instead of in the box.
  - At the right is his 10 GHz rig with 2 Meter transverter, made with Qualcomm parts.

- **Jim Blum KK6MXP Corona**
  - was at Frazier with 9 others, listening with the Kolbly radio. His first contact was with Mel Swanberg. After the contest he had lots of questions and getting interested in test equipment.
  - He was very intrigued by the idea of microwave QRP
- **Courtney Duncan N5BF**
  - has his 1096 DB6NT LNA all boxed up with the 2 relays, tested and ready for the mast.
  - He has checked into the Friday night net with 400 watts on 1096. Now working with mast mounted preamp
  - For moon bounce he is modifying the 1296 RSU transverter to power and sequence it remotely.
  - There was a discussion with Mel and Jeff about 1296 and bouncing signals off nearby mountains to make contacts.
- **Mel Swanberg WA6JBD (Upland)**
  - roved hi desert, 3 stops.

- He observed activity during the contest was down from the previous years. He was with a friend at Oak Hill.
- On the bench before the contest, he found his 10 GHz rig power out was down. An attenuator burned out but for some reason was fun to fix it. Last year at Podisi he noticed finicky output.
- He has some stuff up for sale: Spectrum analyzer. Also has a 26 GHz counter.

- **Rein Smit W6SZ (Alta Loma)**
  - had a good time at Frazier with Brian and Jim Blum for the 1st Saturday of the contest.
  - He was worried about overloading his receiver but it proved to be not much of a problem and was surprised he did so well with such a low power transmitter; 300 mW with a 30 inch dish though.
  - After hearing about the ISEE-3 returning from interplanetary space and doing a moon fly by he decided to get some receive capability for S-band. The time was short, but with the help and hardware support of John Oppen KJ6HZ and Eric Schumacher, WB6KCN, was able to hear the spacecraft until 3 days after the moon flyby.
  - Rein is getting seriously interested in Deep Space receiving.
- **Larry Johnston K6HLH (Lake Los Angeles)**
  - is working with the Arduino micro controller; learning something new everyday. His first project was a set of water sensors and water pumps to automatically water his wife's indoor plants.
  - He will be doing a test with Steve, K6TU, using the digital mode ISCAT-A during the 10 GHz contest.
  - He did a test run on 10 GHz with Rein W6SZ, using the JT65C mode.
  - Mel wants them to write an article.
  - ISCAT-A and JT65C are just a few of the many modes that Joe K1JT, has developed for the amateur to use for weak signal communications.
- **Pat Coker N6RMJ (Lake Los Angeles)**
  - Rebuilding using rigid with quick disconnect for his . . .
  - His 10 MHz oscillator has gone spurious. He got rid of it and is now looking for another. He will be operating from Podecie
- **Chris Shoaff N9RIN San Clemente**
  - passed around a pair of 10 W LED for our amazement.
  - Bought a raspberry pi and touch screen. He got a small keyboard for it.
  - And he worked some more on the PLL for the . . . .
  - Contest LA OC few stops. Back into town on 14th.

SBMS Sister Club: San Diego Microwave Group

(as reported by Ed Munn W6OYJ)

- The following members participated in the 1st weekend of the 2014 Ten GHz and Up contest:
  KF6C Brian Comer
  KK6EME Andrew Comer
  K6NKC Dan Bubke
  WB6TFC Dave Somes
  K6DYD Jerry Gastil,
  N3IZN Chris Arnold
  WA6PPG Carl Ferree
  N6IZW Kerry Banke
  KK6GZJ Mohammad Toossi
  KC6UQH Art McBride
  K6QPV Greg Bailey
  W6OYJ Ed Munn
  N9RIN Chris Shoaff

SBMS President Chris was adopted by the San Diego Club.

- The San Diego Group normally meet 3rd Monday at Kerry Banke's home. Contact Ed Munn for directions: remunn@earthlink.net

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The Summer 10 GHz and Up Contest

First: Why Two Different Weekends for One Contest

Long ago (when I was in college), the ARRL (HF) DX Contests, which are international in nature, were two weekends long. The idea was that participants could experience different propagation conditions on each weekend. However, it discouraged expeditions to rare locations around the globe due to the cost and length of time involved. Eventually these events were pared down to one weekend. I suspect – but do not know for certain – that the 10 GHz & Up contest was set up as a two-weekend event so that entrants could focus on some bands on one weekend and different bands (different equipment) on the other, or that entrants might want to operate from different locations too far separated to both be covered by any single station in one weekend. That's certainly how it worked for me: operate fixed on Frazier one weekend and rove on the other. –Marty N6IV

The Summer 10 GHz and Up Contest
Here's Jason Sogolow's Experience

The biggest lesson learned: just because you've built something yourself, in no way guarantees you'll know how to use the stupid thing right away. I had to determine that I needed to tune the dial up by 7.8 kHz. Cost me a couple QSO's initially, but worked out fine.

I made 19 QSO's in the 3 hours I was up at Secret Site 51 (Loop Canyon), scoring TBD at a later time. Best shot was of course working all three on Potosi, with my measly 300 mW and badly abused waveguide. This picture shows the operating position. I'm always a fan

of external speakers, but this time I found that being able to pick up the speaker and move it around, especially when pointing the dish, proved extremely helpful, especially when you have another operator nearby. (Glen, 'HPZ, whose rig can be seen in one of the shots.) Pretty easy to tell if you're hearing the carrier on your own radio or not, just put that big Motorola speaker closer to your ear!

And, I did make one CW QSO, it was really down in the noise, not possible by any voice mode. It was with someone on Frazier! So there is my successful "digital mode" report.

-- Jason Sogolow W6IEE

The thin black line going off to the propane tank is Jason’s patented "Potosi Azimuth Corrector." His tripod has some issues with the azimuth lock-down.

For those who have never been to Potosi . . .

Chris Shoaff's Contest Experience

This is the second year that I have gone down to San Diego to operate the first part of the contest. I have included a couple of pictures from that weekend. I am glad our sister club in San Diego let me come along on the locations they go to. Thanks go to Greg Bailey for taking us up to San Miguel to operate from a high point. A couple of us were able to make contact with Kevin Jacobson AD7OI in Arizona from there. We had a good time and would gladly do so again.

That's Kerry Banke, Mohammad Toossi and Ed Munn… with Chris's rig on the right.

And Marty Woll's Experience

Once again I set up the N6VI Rover-mobile and participated in the second weekend of the ARRL 10 GHz & Up Contest. I visited four locations, starting with Signal Hill at one end of the route, then to Saddle Peak, then to Secret Site 51, and finally to Frazier Peak at the other end. This weekend netted over 80 contacts, including twelve with the crew on Mt. Potosi in Nevada. Everything worked normally, no smoke was let out, and I encountered no real problems. On my first visit to SS51 (thanks, Pat Coker!), I realized it's just above Contractor's Point, where I cut my Field Day teeth over four decades ago when I was just a kid. I was a member of the West Valley Amateur Radio Club, which was –believe it nor-- all school kids – no adults. We won the 4A category (four transmitters on the air by three or more operators in the field) nationally five times. On Frazier, I finally got to meet Steve Miller W6QIW (Santa Barbara) in person. He's not famous, but it's fun to meet people you have only spoken with on the air. It was a very good weekend.

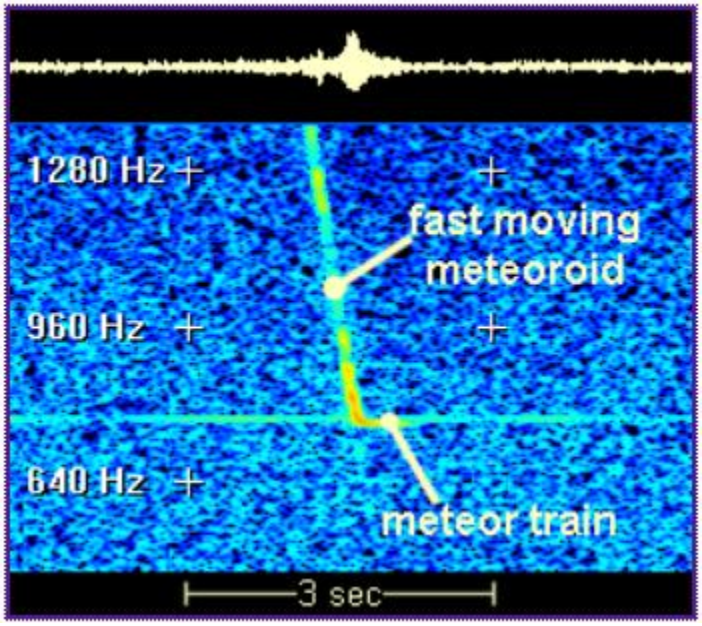
For the two part contest as a whole, I netted just over 41,000 points, my highest score ever in this event. Thanks to everyone who got on, and especially to those who created "target-rich environments" with multiple operators together and to those who took less experienced operators with them. - - Marty N6VI

Ed Munn at Mt San Miguel (photo by Chris Shoaff)

Meteor Doppler

A few months ago, your editor was with Dennis Kidder, on the road; driving, not off to the side . . . watching the water fall display of his SDR on 10 GHz. The trace-history of Dick Bremer's carrier, was echoed in one other line that was only killoherz off. That line changed its separation with the main one as Dennis stopped at a light or turned. We think we were catching an echo off a hill as well as scatter from a more direct line of site to Dick. We weren't sure but later Dennis recorded two traces next to Dick's which changed much more slowly. Dennis thinks those were bounces off of two airliners approaching LAX. Each airliner trace would take its turn to merge with the main then slowly separate as it changed its perspective (thus changing the radial velocity). But for a meteor the microwave Doppler shift is so great it couldn't be displayed. You have to get down into the HF to see the Doppler shift on an audio frequency FFT display.

In a Spaceweather dot com article by the most respected radio-meteor observer -- Stan Nelson of New Mexico-- he shows an example of Doppler from a meteor:



Time is going horizontally in this waterfall chart. Frequency is vertical. The tilt of the trace labeled "fast moving" makes sense. The horizontal bend labeled "meteor train" is harder to appreciate. It is the reflection off of the ion trail as it is laid out motionless behind the meteor. Because it is motionless, there's no change in frequency during its half second of life, which is why it is lined up with continuous scatter from the carrier (the light blue horizontal line).

For the complete article go to:
http://www.spaceweather.com/glossary/forwardscatter.html

On the next page is a recent letter from SARA member Denny Condron K0LGI on the SARA group email. The discussion is about scatter off the motionless ion trail where there is no Doppler.

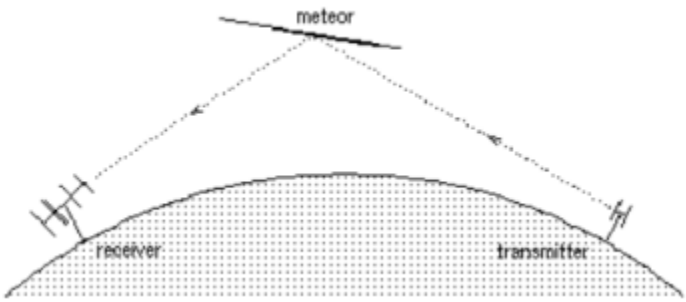
Meteor Observing… Indoors

The commercial broadcast DTV channel 2 pilot carrier at 54.309 MHz, has been a valuable source of continuous signals available in the Midwest that are providing good meteor returns, and are also indicators of sporadic E and enhanced tropospheric propagation. This refers only to DTV channel 2, however any of the lower channels 2-6 DTV pilot carriers are worth monitoring using the same offset (~309 KHz) above the lower edge of the selected DTV channel frequency. Two in particular that are effective in the Midwest US, are DTV 2 stations located at 600+ miles from this monitoring location that are in western parts of Nebraska and South Dakota that are usable for excellent meteor returns daily. Included is an example of this mornings DTV 2 meteor returns as monitoring in Iowa.

Almost live meteor returns can be observed on a variety of frequencies such as the NRCS SNOtel-SCAN system at 40.670MHz, WWV 15, 20, and 25 MHz on HF, Mexican analog video carriers, and DTV 2 pilot carrier monitoring are in use at my location in Iowa and also in New Mexico by Stan Nelson.

Stan Nelson's, KB5VL website has been and continues to be a good resource on this subject for several years:
http://www.roswellmeteor.com/
There's even a Radio-Meteors Google Group:
https://groups.google.com/forum/?fromgroups#!forum/radiometeors discussing similar monitoring activity:
Denny - K0LGI Marion, Iowa

Here's two articles written by Denny himself on scatter reflection off the ionized meteor trail (not Doppler)
http://www.roswellmeteor.com/Receiving%20Meteor%20Reflections%20Using%20DTV%20Transmitters.pdf



http://www.roswellmeteor.com/denny_k0lgi__snotel.html

More SBMS History

Tommy Thompson **by Ed Munn W6OYJ**

With the exception of time out to earn his B.S. in physics at Fresno State College, he served his country continuously from 1940. First in the Navy during World War II, then the Korean War, and later in the Civil Service. He came to Corona with the National Bureau of Standards in March of 1952 and became head of Missile Countermeasures Branch I, Countermeasures Division, in February of 1957.

Tommy as he was known to his many friends throughout the Corona Laboratories was very active in amateur radio and conveyed his enthusiasm and love of experimentation to numerous local young people who will long remember him.

He was a native of California, having been born in Reedley in 1917. He died in January of 1969. He was only 52.

Tommy was probably the most active microwave ham in history. In reviewing his recent logbooks, I found more than 600 two-way QSOs above 2300 MHz since June of 1960. His activity on the high bands started back in 1946 and he shared six different microwave DX records, including the 3300 MHz record. He was the first to implement the "beer-can" Polaplexer and more recently used a version of it to receive 2300 MHz signals from the Lunar Orbiter, near the moon, in late 1966.

In memory of his outstanding efforts to develop the technology and promote the use of the amateur microwave bands, The San Bernardino Microwave Society applied for and received his call sign, W6IFE for our station.

For more on the history of SBMS see this 1994 article by David Laag: http://www.ham-radio.com/sbms/historyOW.html

Digital Mode for Amateur Microwave Communications by Rein Smit W6SZ

Digital methods have gained popularity over a wide amateur radio frequency spectrum largely because of intense efforts by K1JT and others. Its use in the microwave has fallen behind VHF. This article is an effort to provide practical information on how to use it with microwave amateur communications.

The general use of 10 GHz is almost totally limited to 2 weekend per year with as main event, the ARRL10 GHz and Above Contest. The use of digital methods could contribute to an increase in use of this amateur frequency band by providing a more efficient communication method that could be used from stations located at home instead of roving.

> The character of microwaves in general, is the use of highly directional antennas which makes an auxiliary channel almost a must for frequency coordination, times of activity; in short scheduling. Considering the US West coast with California particularly in mind, we have during contest periods access to a powerful amateur UHF FM system for very intense liaison support. Very little activity takes place outside this frame work.
>
> (Mel Swanberg address this in more detail in the next article. –ed)

VK7MO's work combined with the help of K1JT has stimulated some to explore 10 GHz digital for terrestrial, aircraft, rain scatter and perhaps down the line EME use on the US West Coast. Because of use waterfall displays detection limits of radio signals are highly increased. The existence of propagation of radio signals, the possibility of reflections, far unknown paths might be discovered. Changes in propagation over time can be discovered and explored. Conservatively WSJT could give you at least an extra 15 dB over sideband use and at least 6 dB over audible CW.

The procedures are more or less structured and leave little else than the basis for a valid amateur radio contact, call, report, unique piece of info exchanges. The pleasurable sound of CW is often totally missing. The processing part of the methods requires some form of computer processing, what represents a negative for field operations.

(Rein Smit's Article Continued)

What is required to add WSJT capability to my station?

This is a wide open question as many stations these days use computers for logging and other tasks such as CAT, remote control, other digital methods such as PSK and the like.

> Keep in mind that the phrase digital communications and anything with JT (that's Joe Taylor) in the acronym, has to do with what is modulating the 10 GHz. The 10 GHz is not what's being digitized. Think of it as computerized Morse code. This JT stuff makes it all the way through your transverter and even through the audio at both ends. --ed

The computer requirements are minimal. Depending on the operating system and computer type or computer age, a software driven R/T switching is part of the method. This might have consequences for antenna relays switching, etc. The essential waterfall FFT software needs some form of display, often already part of a computer. The hardware side of adding WSJT just as for your computer at home is continuously needing upgrade.

Different versions of WSJT are available as freeware, well written and extensive user manuals are available. The internet provides a rich treasure of information, dedicated user groups, and help on use hardware and software. All you need are key words. (See the end of the article for links to software and hardware sites.

WSJT has a learning curve for using the software and getting familiar with the data exchange formats. Detailed knowledge for this is widely available in WSJT user Manuals and many sources on internet.

Besides the availability of some form of computing device and usable monitor (for field and day light) the software provides a switch closure action for receive / transmit changes. Depending on the computer, this might be a closure of a traditional serial port or for more modern computing devices an USB serial port and a digitally operated relay.

One special version of WSJT is WSPR mode (weak signal propagation reporter). This mode provides for transmitting of station's data, call, grid square, and power. Reports of WSPR signals involve a dedicated WEB

site. This web site would provide reception reports by 3d parties of a transmitting station by active receiving stations. (reverse beacon). For California, there exists now an active WSPR website for 144 and 432 MHz reporting propagation. There's none for 10 GHz.

Your end of this network could be working with as little as: a computer and internet connection, a little dish, an RTL-dongle and a TV LNB on 10 GHz. The January 2014 Newsletter has two articles on this minimal 10 GHz receive-only station:
http://www.ham-radio.com/sbms/newsletters/2014nwsltrs/01sbms2014.pdf

The goal is to provide AROUND THE CLOCK ACTIVITY for a handful of dollars. Only the transmitting part of the WSPR source would need transmitting capability. Most HF WSPR transmitting stations run less than 5 watts and often get receive reports around the clock from all over the world. Microwave bands need much lower transmitting levels because there's no hope of going that far.

Here's a link to about a dozen other links on digital mode amateur communications. It is not listed here because Rein is continuously adding to it.

http://www.nitehawk.com/w6sz/sbms_jt4g_nl.html

Digital Mode Communications and Contest Liaison Radio

The next four paragraphs from Mel Swanberg WA6JBD, address the liaison issue, as it pertains to microwave activity and Rein's experimentation in general.

Within the confines of the ARRL 10 GHz and Up contest, here in California and parts of Arizona and Nevada, use of a very large linked UHF FM mobile relay system plays a huge role in liaison, the auxiliary communications channel required to align the microwave path. With the high performance radios in use on the West Coast, 10 GHz has the capability of easily out performing 2 meter SSB, or even HF, which is traditionally used in other parts of the country during this contest. Not only is 10 GHz proving to be able to outperform 2 meters, use of 2 meter SSB for liaison requires the addition of another complete contest grade station to be packed along with the microwave equipment. The liaison channel needs to be able to outperform the microwave circuit, especially if the envelope is being pushed to new distances and over difficult paths. As a result of this need, this large private linked system is temporarily made available for the use of participants in the ARRL 10 GHz and Up contest and, more recently, the locally sponsored SBMS 2 GHz and Up Club Contest.

Here, with our unique resource, liaison activity gets concentrated in one place, and it becomes possible for almost all active contest participants to share a common intercom channel for liaison. Collecting everyone in one place has proven to be a tremendous help in stimulating activity during the contests, and allowing for some very long haul contacts to be made that otherwise would not have occurred. As such, it can become quite busy, to the point it can be intimidating to the uninitiated contest participant. Because of the intense level of

activity, we tend to discourage experimental activity during the contest if it will occupy an inordinate amount of air time on the liaison channel.

On the other hand, because of the concentrated activity on contest weekends, experimental operation of digital modes such as WSPR and WSJT becomes very attractive to those microwavers who are less interested in competition, and more interested in the experimental aspect of microwave operating. This has created an artificial barrier to more active experimentation, particularly over long or difficult paths, or to remote locations. Lining up a contact between operator's respective home locations can be done via landline, or internet (Skype, etc.), but these easy paths may not be challenging enough for the digital mode under test to even make it worthwhile. A need exists for long haul experimental microwave activities outside the clutter of the regular contests.

There are a number of private UHF FM resources that can be pressed into service for loosely organized activities requiring medium or long haul liaison. If there is a specific need for these resources, given sufficient notice, these experiments can be accommodated outside of the organized contests. Once enough 10 GHz operators are equipped and practiced with these digital modes, they will become just one more tool to use during the contest when voice modes, or even CW perhaps, won't quite cut it. Once it becomes routine, excessive use of the common liaison channel during high traffic periods won't be an issue.
Mel - WA6JBD

September Tech Talk was Dennis Kidder

He gave a very complete introduction to microcontrollers and Arduino in particular. We learned that it is more than a microcontroller it is a development environment. He also showed us some ham radio applications; having just written a book on the subject.

Dennis has made available his slide show. Go to the SBMS website http://www.ham-radio.com/sbms/ and do a search for “Arduino” or W6DQ.

Gary Heston's ATV Mobile Studio

Not only can you watch our meetings live (well delayed by 240 milliseconds) You chat to other viewers about what you are watching (or anything else.) Enter the chat room by clicking on the white space on the right of the website described below.

Just as a reminder, this is how you watch SBMS meetings from home:

http://www.batc.tv/ch_live.php?ch=2&id=139

Better yet memorize the following
Keywords: BATC TV
and use Google
The TV part is easy to remember. Think of the BATC as batch without the h. It's a British website (that's the B) Once you are there, on the left, you have to pick a stream. The stream to choose is:
W6ATN.
Memorize W6ATN as ATN in California. W6ATN is the club call sign for six 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 which is provided by: Roland Hoffman, KC6JPG

- The newsletter is to keep member informed on current activities of the "active" members; the members that come to the meetings or use ATV to report in.
- The website is for articles and all activities of the past.
- But questions or even bragging is for the SBMS Reflector. Send your email message to: sbms@ham-radio.com. More than 80 people will see your question or your bragging. (To sign up go to: http://lists.altadena.net/mailman/listinfo/sbms.)

Microwave Mystery Gizmo of the Month

The prize?
To show off how smart you are. (That's all we live for anyway, isn't it?)

If you think you know what it is or want to discuss it, go to SBMS Reflector… (sbms@ham-radio.com)

The correct answer will not be posted here. (It's not that I don't want you to know. It's that I don't know. --ed)

Needs, Wants and For Sale (Updated 28 Sept)

- **For Sale from Chris Shoaff**: N9RIN cshoaff@yahoo.com
  - 30w 1296 MHz PA kit $50 + $5 for US shipping
- **For Sale from Mel Swanberg:** wa6jbd@verizon.net
  - HP 141T w/1200 MHz Plug-in And 3 18 GHz Plug-ins. Make offer, so cal local only.
- Wanted by Jim Blum: tenbakerst@aol.com
  - Source material; papers; on microwave and microwave construction.
  - Info on digital modes for microwave (WSPR, etc.) Info on beacons/beacon construction
- **For Sale from Bill Burns:** Bill will only rarely come to the meetings, so if you want any of this, please contact him by email at . . . bburns@mediacombb.net)
  His address is: 247 Rebel Road Ridgecrest CA 93555 and phone: 760-375-8566
  - 8 watt 5 GHz TWT's with power supplies $50 each
  - copper wire enamel coated #14 many feet coils $10 each (coils are like a foot in diameter and maybe a dozen turns or so…30 or 40 ft long wire)
- **For Sale from Doug Millar (drzarkof56@yahoo.com):**
  - a Rohde and Schwarz 309 10-18GHz Signal Generator in perfect shape. It is digitally synthesized and has a pull out instruction card. It has internal modulation and will also sweep. Will accept $900.

  - I also have an HP432 power meter, cable and head (478) in working order for $100

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

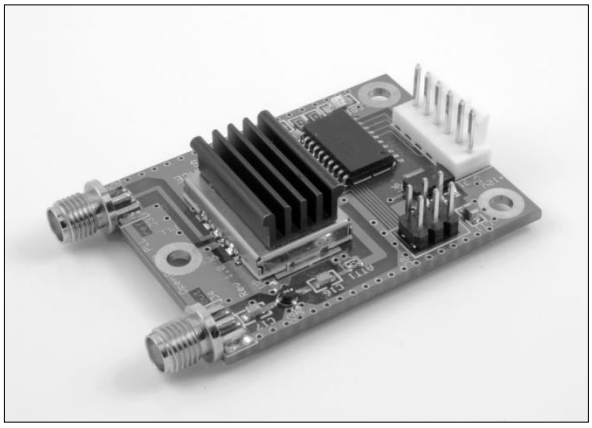
Member Ads Continued

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 editor at: 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). At least one meeting a year are joint meetings.*** 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 Walter Clark @ 714 882-9647

The Reflector (SBMS Group Email)

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 (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.)

The SBMS Website and Newsletter

The SBMS Reflector is ephemeral. There's no record kept. The Newsletter has a slightly longer life. It is sent to members and past issues are recorded in the website. It's URL is: http://www.ham-radio.com/sbms/ 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
Website: Rein Smit: rein0zn@ix.netcom.com

The newsletter is created about the middle of the month and broadcast as a link inside an eMail letter to the members. This is mailed to you on the weekend prior to each meeting. SBMS Newsletter and website material can be copied as long as SBMS is identified as source.

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