SAN BERNARDINO MICROWAVE SOCIETY, Incorporated

FOUNDED IN 1955

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

W6IFE Newsletter

March 2011 Edition

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At the **March 3, 2011 SBMS meeting we will have** Doug, K6JEY talking to us about power meters. His talk will have two parts. The first part will be a review of the theory of how power meter couplers, terminated meters, and calorimeters work and what their general calibration limits are.

The second part of the presentation will be to calibrate member's 23cm and 13cm watt meters using a high power calorimeter from Doug's lab (A Bird 6091). We hope to have 10-200 watts available on 23cm and a smaller amount for 13cm. We may also have a set up for 2m as well for general calibration. When you calibrate your meter, you will receive a calibration paper that will help you organize your readings.

The Bird 6091 information can be found here.http://www.bird-technologies.com/resources/discontinued/bec_manuals/920-6091-1.pdf The instrument's accuracy is a little over 1% of reading from DC to 2500MHz and the power range is from 10watts to 200.

If there is more interest in calibration at other frequencies, it can be done either in another talk or at my lab or Dave's lab where other standards are available. Doug K6JEY"

The SBMS meets at the American Legion Hall 1024 Main Street (south of the 91 freeway) in Corona, CA at 1900 hours local time on the first Thursday of each month.

REMINDER- NO PARKING IN THE CHURCH LOT

Last meeting: Larry, K6HLH, called the February 3, 2011 SBMS meeting to order at 7:00 pm. There were 17 people present with one visitor Mark K1MAP. Both the President and Vice President were absent. The Pledge of Allegiance was recited. Larry, K6HLH read the secretaries report and it was approved. Pat, N6RMJ gave a report on the Desert Rat's swap meet at Palm Springs. We had good representation there and a lot of people stopped by to see what we were doing. Tom, WB6HYH, joined the VFW and will be getting a key for the building. We went around the room for activity reports. We had a couple of people check in on the ATN. Pat made a suggestion that we buy a projection screen for the VFW so that we wouldn't have to set up the small screen each time we want to use it. Tom, WB6HYH will talk to the VFW people to see if it would be OK to mount it on the wall. We turned off the ATV

portion of the meeting for Marty, N6VI, to give a talking on winning strategies for the 10 GHz and Up contest. Before the talk Dick, WB6DNX read the treasures report and it was approved. The bank statement and Dick both agree. Marty has been in many contests in which they have won and set new records. The main thing required to win is dedication of the people involved. The meeting was adjourned at 8:55 PM. Recording Secretary, Larry Johnston, K6HLH

Scheduling:
April 7 Jacob Portukalian, KD5FEG has been studying engineering at UCLA and will have a program on what is going on in some of the microwave labs.
May 5 Doug K6JEY will do a talk on beginner labs and what gear to get at the beginner and intermediate level to start your microwave lab.
June 2 Sidewalk EME by Doug K6JEY
June 11-13, 2011 ARRL June VHF QSO Party
June 18 ARRL Kids Day (good chance to introduce youngsters to microwave).
June 25-26 ARRL Field Day
July 7 open. What topics would you like to hear about?
July 16-17, 2011 CQ WW VHF contest
August 4 Contest preparation.
August 20-21 ARRL 10 GHz and Up contest first half
September 10-11 ARRL September VHF QSO Party
September 17-18 ARRL 10 GHz and Up contest second half.

Wants and Gots for sale.
For Sale 4 ft spun Aluminum dish with 2 WR90 feeds $50 pick up Long Beach 562-810-3989Doug K6JEY
For Sale 30w 1296 MHz PA kit $50 + $5 for US shipping Chris Shoaff cshoaff@yahoo.com
For Sale Heathkit cantenna HN-31 $10, Heathkit AM-2 VSWR meter $5 , several long lengths of RG-11donation, Radio Shack Patrolman PRO_77A VHF HI/LO scanner with crystals 153.845, 155.625,147.15, 146.76, 162.650, 162.4, 146.64 $15 Bill WA6QYR bburns@ridgenet.net
For Sale Gonset Linear 400 watts output 2 meters 4CX250R Great for WSJT65 mode $400 Doug K6JEY
For Sale 10 GHz slotted waveguide antennas $70 kit, $95 assembled plus shipping Dan W6DFW W6DFW@apex-scientific.com
For Sale: a classic secretary desk with fold down main door. It has several compartments to place transceiver, tuner, and power supply with wires in back. You can put the whole station in a dark reddish wooden cabinet out of sight when door is closed. It is out and useful when door is opened. 18"Deep x 52" tall x 34" wide. $50 new condition.
Can be delivered to SBMS meeting. Bill WA6QYR bburns@ridgenet.net

History: Southwestern X-Band Beacons
By: Greg Bailey, K6QPV

Part 1 was in the February SBMS newsletter.

Part 2 follows. Thanks to Greg, K6QPV for his work in collecting the information and putting it into a paper.

Figure 10. The Palos Verde beacon shown in one of its earliest locations. In its present location, the beacon is rack mounted.

Palos Verde- Towards the end of 1990, Chip Angle, N6CA, constructed a beacon to be located in the area commonly known as Palos Verde. The beacon followed the technical migration away from the wideband Gunn diode and toward crystal controlled narrowband. At the time there were only 12 GHz FETs available, with no data for their operation at 10GHz. This required Chip to experiment and redesign the circuit a number of times prior to achieving success. See Figure 10.

The PV beacon experienced a geographical rough start, with its first location being blocked by trees and buildings. Its second home was a radar site overlooking the LA Harbor. A 100 foot pre-existing piece of elliptical WG90 was used for the feed line on a commercial tower. It was later discovered that this waveguide had at least an extra 8 to 10 db of insertion loss. Coverage from this site was very good for most of Southern California. The site was later sold and the beacon was moved to another excellent location owned by Gary Belda, K6ENS (SK) which overlooked Crenshaw Blvd. Gary was instrumental in providing these locations for many years and did all the tower climbing.

The beacon was later returned to PV in 2004 with the tower work done by Glen Allen, KE6HPZ. In its present location it enjoys excellent coverage to the north and south, but is blocked by trees to the east. Currently this beacon provides great ducting info up and down the coast and deep into Baja, Mexico.

Frazier, Truly a RF benchmark- No other beacon discussed thus far commands the ether as well as the Frazier Peak (aka Frazier Mountain) beacon, N6CA/B, operating on 10.368310GHz. Operating from a site that was provided by Cactus Radio organization, the Frazier beacon was installed in 1997 at 8100 feet. The beacon enjoys an absolute amazing area of coverage. It has been copied in Sacramento, 820 miles south by W1LP/MM off the coast of Puerto San Carlos, Baja, Mexico, and on Mt. Harquahala, 75 miles west of Phoenix. The Frazier machine runs 1.3 watts into a slotted Omni-direction antenna with a 14dBi gain. The radome is rough surfaced PVC (0.5 dB loss) and painted with high temperature flat BBQ paint to absorb as much heat as possible. In the 14 years of operation it has only partially failed once due to a temperature problem. See Figure 11.

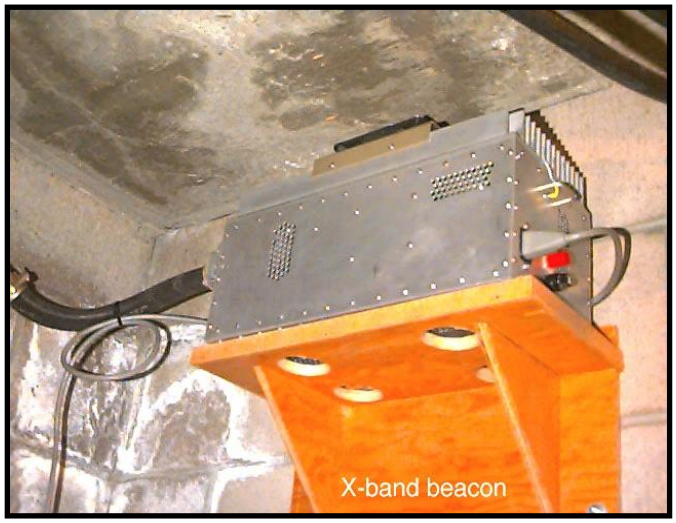
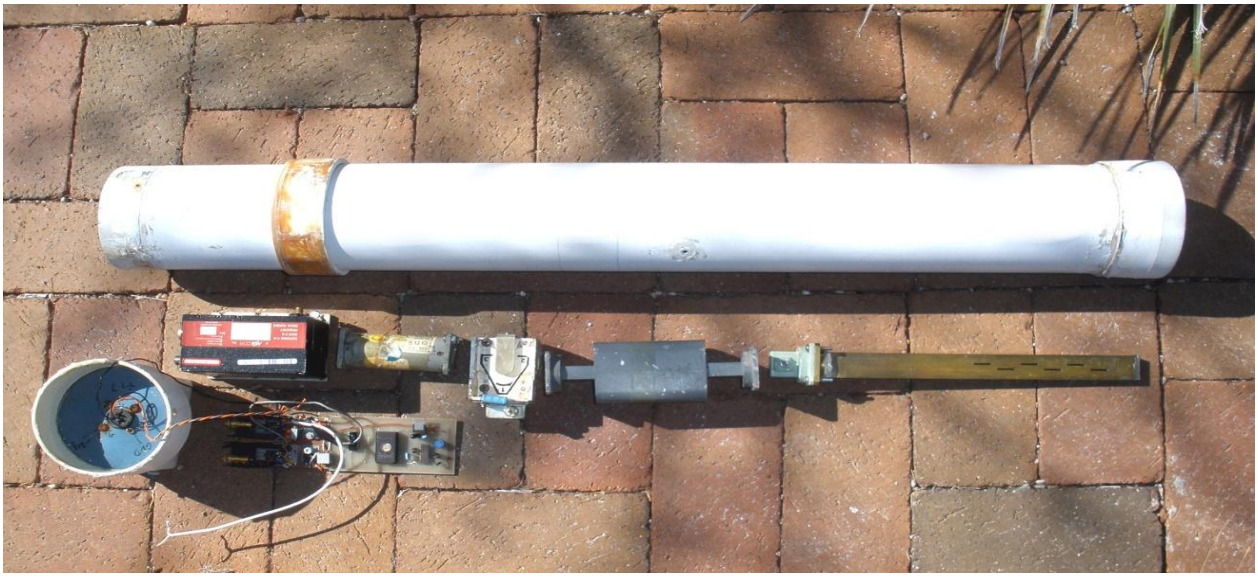


Figure 11. The Frazier Peak beacon has probably been heard by more microwave amateur operators than any other beacon in the United States

Technical footnote: The PV and Frazier beacons maintain a frequency accuracy of +/- 100Hz. Additional information on the Frazier and PV beacons is available at: http://www.ham-radio.com/sbms/

Figure 12. After 21 years of service, the San Diego beacon was shipped to Tucson were it is about to be installed on Mt. Lemmon The 'brick' is on the left, circulator, misc, and slotted WG antenna on right. Photo courtesy of Steve Bell KJ7OG



San Diego Goes Dual Mode-

In the summer of 1989; a new beacon was constructed by Kerry Banke,

W6IZW, and Chuck Houghton, WB6IGP (SK), in San Diego. The design incorporated a WB Gunn diode and a NB 'brick' oscillator. The WB output was on 10.265GHz and operated under the Callsign of W6IZW/B while the NB was crystal controlled on 10.368100GHz and used the call WB6IGP/B. A single slotted waveguide antenna was fed by both signals while the ID was CW and generated by a microprocessor. Once this beacon was completed and installed, the older Gunn diode beacon, located on Mt. Palomar, was decommissioned. The first QTH for the dual mode beacon was at the COX Cable antenna site located at the 1540' level on Cowles Mountain. Although it operated for over 7 years, few knew that its 'placement' was not exactly approved by the Cox's management. The beacon spent the next 2 years at a private residence on the side of Mt. Helix. Little is documented about this QTH other than the geographic area in SD. The next move was a crowning achievement, assisted by Jerry Petrizzi, WA6VLF/W6VLF, it was relocated to KNSD-TV's transmitter site on Mt. San Miguel, where at 2,560', and it served both SD and LA. For the next 13 years the beacon continued in operation, only being shuttered for contests and maintenance. During these years the crystal for the NB 'brick' continued to age causing the carrier to drift to 10.368070GHz at last check. The dismantled beacon is shown in Figure 12.

When Jerry retired from NBC in 2007, the beacon was relocated about 200' NE to the transmitter site of KPBS-TV where it operated until 2009. Finally, after 21 years of continuous operation, the beacon was removed from service. In its new incarnation the power supply, GPS reference, PLL, and RF driver are located in a 19" cabinet in the KPBS building. A coax transmission line carries the RF drive to the PA; see Figure 13, which is located in an outdoor housing atop the building. The 27dBm output of the amplifier is connected to a piece of slotted guide. This beacon is presently operating under the Callsign of K6QPV/B.

Conclusion: The reporting of history always discovers a few *closet skeletons*, and this effort is not without! In gathering material for this article I continued to hear about a 'mystery beacon' that operated approximately 5 years ago on 10GHz in Pine Cove area of Idyllwild? Others reported its location in the San Bernardino range? Evidently, its QTH and Callsign were never officially announced by its less than boastful operator? My multiple sources of information on this phantom beacon remained adamant in their story line, leaving me wondering that maybe they were all standing too close to the focal point of their dish while in the Tx mode.

Figure 13. The present SDMG 10G beacon.

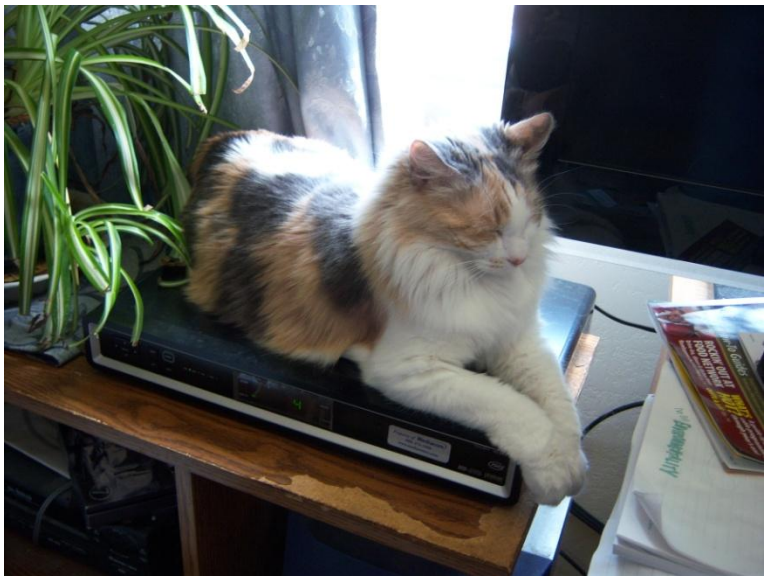
In closing, the primary topic has been 10GHz beacons, but I would be remiss if I didn't recognize two other members of SBMS/SDMG who have provided 'DC' band beacons. Chip, N6CA, has provided Paul Lieb, KH6HME, in Hilo, Hawaii with beacons from 144MHz to 5.7GHz (excluding 222 and 432 built by K6IBY). Since 1995, Jack Henry, N6XQ, of San Diego has provided beacons on 222, 432, and 1296MHz. Jack has recently relocated to South America (OA4TT) but he has turned his squadron of hardware over to the SDMG who have already relocated the 1296.3 machine on San Miguel.

My sincerest appreciation to Ed W6OYJ for starting me on this journey, Dick WB6DNX for our myriad of email exchanges, without Steve WA6EJO the unique history of the Ventura beacon would have been lost, Kerry N6IZW for 30+ years of memories, Chip N6CA for his beacons and their history, Art KC6UQH, Jerry W6VLF, and Steve KJ7OG for the photographic history, and the many others who provided information. Special appreciation goes to the editor of the W6IFE Newsletter – respectfully known as 'Sir William'. Thank you Bill, from all of us for your 15 years of work.

Greg
K6QPV
GBailey@Mail.SDSU.Edu

Activity reports from the February SBMS meeting: Dick, WB6DNX went to Palm Springs and sold 10 radios; Jeff, KN6VR is working on a 1296 antenna; Walter showed a Cassegrain antenna and 24GHz motion sensors he is using now; Dave, N6HD was active in VHF contest; Wayne, N6NB was active in VHF contest; Tom ,WB6UZZ not much; Mike,K1MAP mentioned that "VHFSITES" on Utube had videos of sites; Rein, W6SZ went to Palm Springs and working on 2 meter LFA antenna; Jason, W6IEE was active in the contest; Mel, WA6JBD is working on microwave paths; Marty, N6VI went to ARRL meeting in Newington; Pat, N6RMJ went to Palm Springs. Thanks to Larry, K6HLH for providing these notes.

There are a number of home web sites that provide information on how some amateurs spend their time. Some are in the pursuit of some "different" and "unique" parts of the hobby that get more into the physics and theory of what is to be. One site is the K5SO.com where the curiosity of the our star the sun is being checked for how much noise it makes and the relation of that to the numbers we have access to over the likes of WWV and other web sites from the scientific community. Joe, K5SO has a graph on his page that lets you take the size of your dish antenna and the solar flux reading for that day and come up with what the ratio of cold sky to pointing at the sun should be in dB. Earth-moon-earth stations of amateurs frequently use the noise seen coming from the sun as a reference of how well their station is receiving weak signals. If you can repeat ably measure the same noise level, you have some confidence that the receiver is OK from day to day operations. This measurement usually means turning off the automatic gain control in the main transceiver so that the signal level is not modified by that circuit in the radio. S-meters are supposed to read 12 dB signals level per S unit. Most receivers these days aren't even close to having a calibrated S-meter. I measured my FT-817 signal strength indicator and found it was both dependent upon what the pitch of the CW tone was and what part of the signal level curve verses indicated level was. It was not following a constant scale factor. Since the 1296 MHz converter I have comes out at 28 MHz I can use another instrument I happen to have, a General Radio 1216a IF signal meter that is tuned to 30 MHz. This instrument allows me to directly read the noise level I am seeing in my EME station. So far I am only seeing a few dB of sun noise where I should be seeing 10 dB for my 8 ft dish antenna on 1296 MHz. More later as I learn more and measure better. Bill, WA6QYR



Sunshine, the cat, likes to lie on the Mediacom cable box during the cooler days to get warm. The "kitty warmer" is quite warm for a modern box. With all the industries trying to meet US Congressional "green laws". This box has a ways to go.

The San Bernardino Microwave Society is a technical amateur radio club affiliated with the ARRL having a membership of over 90 amateurs from Hawaii and Alaska to the east coast and beyond. Dues are $15 per year, which includes a badge and monthly newsletter. Your mail label indicates your call followed by when your dues are due. Dues can be sent to the treasurer as listed in the banner on the front page. If you have material you would like in the newsletter, please send it to Bill, WA6QYR at 247 Rebel Road Ridgecrest, CA 93555 or, bburns@ridgenet.net, or phone 760-375-8566. The newsletter is generated about the 15th of the month and put into the mail at least the week prior to the meeting. This is your newsletter. SBMS Newsletter material can be copied as long as SBMS is identified as source.

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