



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 February 2011 Edition

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At the **February 3, 2011 SBMS meeting we will have Marty Woll, N6VI** talking about contest organization and tactics tailored for SBMS contesting. He has a number of ideas for us from his operation both as a rover and DXpedition participant. We get to hear from an expert!
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

QST RCARA, QCWA, SBMS

I just learned that SBMS member and VHF/UHF pioneer Ed, K6ODV has passed away. Many of you met Ed when was getting active on 10 GHZ several years ago but he was most well known for his decades of work on 6 meters.

John, KJ6HZ

Edward Felix Diyorio, K6ODV, 82, passed away on January 14, 2011. Ed was well known as a VHF and above enthusiast, for many years. His high towers, supporting many VHF through microwave arrays, located behind Wal Mart on Van Buren, were easily viewed from the parking lot there. He was the first to work 100 countries on 6M, and was probably the first Riversider to do Moon bounce. Although not involved in the club, he had been a program presenter at least once, on the topic of 6M DXing. Thank you to Chuck, W6WUG, for the heads up, and to Arlo, WA6UDR, for additional information.

Scheduling:

March 3 Wattmeter calibration for 23 cm. We will have a Bird 6091 high power Calorimetric Wattmeter in place that covers DC to 2500 MHz and 5 to 250 w with 2% of reading accuracy. We will have power generators on 432 MHz and 23 cm. We will have a short talk on calibration of watt meters and do a clinic on calibrating your meter. More details later.

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.

Last meeting-Michelle, W5NYV had a great presentation on crystal history and crystal oscillator development and how to keep them on frequency with all the environmental conditions we see in the field. She had some experience with her 106.5 MHz LO drifting while out on the 10 GHz contest. **Paul, KB5MU** added his comments about trying to get an EICO 753 VFO to be stable. Michelle had comments about the differences between stability, accuracy, precision, phase noise for the various cuts of crystal. Great job Michelle! Marty N6VI, Vice Director for ARRL Southwestern Division (and SBMS member) had some words on what is going on at the national level with FCC given the task of collecting up more spectrum to give to the broadband commercial interests. Marty and a number of other roving Microwavers will be on for the January contest. Visitor **David Greenhut, N6HD** ARRL LAX section manager was also present to visit the SBMS and remind us that there will be an ARRL Hamcon in LA in September. SBMS still needs another member to become a member of the American Legion so as to keep key people available. It was voted to send \$200 per year to the Heaps Peak building owner for support of our beacons and interests there. Dick, WB6DNX has Wouxun model 3 dual band HT's available for \$119 plus tax or \$130. 27 people present.

Wants and Gots for sale.

For Sale 4 ft spun Aluminum dish with 2 WR90 feeds \$50 pick up Long Beach 562-810-3989 Doug 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, MFJ 941D antenna tuner with manual in box \$70, several long lengths of RG-11 donation, 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. \$80 new condition.

Can be delivered to SBMS meeting. Bill WA6QYR bburns@ridgenet.net



Activity reported at the January SBMS meeting: Dick, WB6DNX has been cleaning up his garage/shack; Chuck, WA6EXV has the Heaps Peak 10,386.370 MHz beacon ready to go up on the hill when the snow clears away; Bill, WA6QYR has been trying to measure power out of his 1296 MHz amplifiers with mixed results and trying to figure out WSJT mode operations; Ed, W6OYJ is working on his Endwave 24 GHz rig; Dennis, W6DQ has been having fun with his FlexRadio; Tom, WB6UZZ is working with his AIL 2075 Noise Figure meter; Dick WB6JDH did some SDR work; Rein, W6SZ has been playing with 10 GHz signal bounces as viewed from his house; Michelle, W5NYV has been playing with some modeling software; Chris,

N9RIN has been working on some 900 MHz RFID hardware; Paul, KH6HME was here on the mainland for his annual visit and indicated that the Pacific propagation was poor in 2010; Jacob, KD5FEG has been working on a 2 GHz rig and some SDR kits; Jason, W6IEE has been collecting RF parts; Wayne, N6NB has been reworking the rover 10 bands in a box rigs; Jeff, KN6VR has been dealing with snow; Larry, K6HLH has been dealing with snow; Pat, N6RMJ has been working on his 1296 MHz rig; Doug, K6JEY has been acquiring more 79 GHz parts. ATV check-ins were KN6CV, KB6CJZ, K6BNN and AF6HP.

Part I of

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

All of us have participated in one or more 10GHz and up contest? We pack the car and head for a nearby geological outcropping. Upon arrival we typically enter into what I have called, “the setup trance”. This consists of erecting the tripod, mounting the rig atop the center post, locating the battery within close proximity, attending to the power supply connections, locating the logbook, finding a location for the cooler, and then applying power. After ‘power up’ we start an azimuth sweep listening for a signal from an established and known signal source: *A BEACON*. The first sound of the IF radio barking out a beat note of the beacon’s carrier provides some solace to the nagging anxiety we all share- will my rig still work after the drive?

The beacon provides some very essential information; it is a technical sobriety check to make sure everything is operating within our expectations. Once heard, we calibrate our compass rose, check our frequency, and get an idea of what the thermal ducting is going to be like? I usually swing the dish around and look for a second beacon just to give myself some additional confidence. To eliminate the panic of trying to find a beacon when in fact I am tuning the wrong frequency, I have gone so far as to write in pencil the headings and frequencies of the LA beacons on the backside of my dish. I was always a little embarrassed about this form of mnemonic, however, during some of the Tune Up Parties in Freedom Park I have noted other SBMS’ers have resorted to the same form of crib sheet.

The southwestern X-band beacons have become a tool we all count on whether it is contest time, or perhaps the first signal we heard when we completed the construction of a receiver. Out of respect for these devices, and before all of us enter the land of the ‘senior moment’, I thought I would research ‘the who and when’ of the southwest X-band beacons. It was the author William Shire that said, “Never attempt to write a history while those who participated are still living”. Thus, while I have talked to a number of people as I gathered information for this article, I am sure there are still a few readers that will be able to enhance its accuracy.

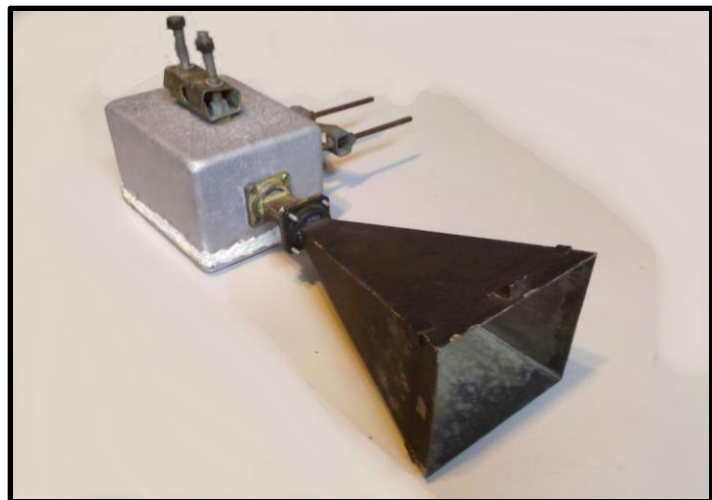


Figure 1, RF head of the first Gunnplexer used by W6BLK. Opening was 4X5” Photo courtesy of W6OYJ

San Diego is up and running- The first X-band beacon in the southwestern US was established during 1983 by Donald ‘Red’ Truax W6BLK (SK), at his residence in La Mesa, CA. His QTH, some 850’ in elevation, had a commanding view of San Diego as well as north toward LA. The beacon consisted of a WB Gunnplexer mounted to a horn (Figure 1). The entire unit was

affixed to a rotor allowing the signal to be remotely directed through 360 degrees. Using a matrix of coax relays, Red could use the beacon as an LO, piping down the IF to his HF receiver in his shack (Figure 2). In this way, if you could hear the beacon, there was no question you could have a QSO with W6BLK. Upon BLK's death, the beacon's operation was discontinued.



The hardware shown in Figure 1 and 2 is presently owned by Ed Munn, W6OYJ.

Figure 2. The power supply, modulator, IF and speaker for W6BLK's Beacon/Duplex Rig. Photo courtesy of W6OYJ

Santiago appears-

Chronologically, the next beacon to appear was that of Dick Bremer's, WA6DNX/B. Thought to be established in the early summer of 1987, it was located atop of the AT&T building at the 5680' level of Santiago Peak.

The beacon used a WB Gunn diode and operated on 10.250GHz (10.250 – 10.280 with a 30 MHz IF) and pumped about 15 mW into a slotted waveguide antenna. The RF head was mounted to a antenna platform suspended between two telephone poles some 30' off the ground as shown in Figure 3 (see white arrow).

The beacon's power supply was housed in the same block house as a nearby 450MHz repeater. It is interesting to note that some of the same audio that was used to ID the repeater was also piped over to the beacon's modulator- thus the 450MHz repeater and the 10GHz beacon shared the same ID'er.

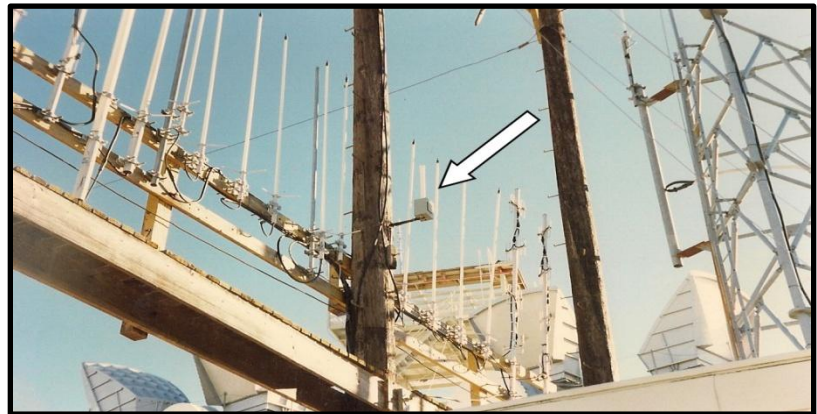


Figure 3. Bremer's WB6DNX/R beacon shown mounted atop Santiago Peak. Photo courtesy of Dick Bremer

The lifespan of the beacon was limited to about a year, that was when Dick found that water had seeped into the antenna housing, ran down to the Gunn, and turned it into a "pile of white oxide".

Dick is of the opinion that the beacon was probably copied by as few as 6 operators. Figure 4 shows Gray Bickford, WA6BJY holding the beacon on the day it was installed. Soon after installation, Ed Munn, W6OYJ, copied the beacon on August 7, 1987. Dick sent Ed a QSL commemorating the occasion with his comment "First Copy" being hand written, see Figure 5.

Not one to quit, Bremer's replacement beacon was built using a crystal controlled Frequency West brick that was donated by Chuck Swedblom, WA6EXV. This is perhaps the first use of a crystal controlled beacon, benchmarking the 1989-1990 trend of moving away from the Gunn diode.

The 'brick' put the carrier on 10.265 GHz and used wideband FM for the modulation. The same Omni-slotted waveguide antenna was utilized as well as the same location, and not to be outdone- the beacon was connected to the same ID information from that 'nearby' 450MHz repeater. At this point, while I was gathering information on the history of the beacon, Dick stated, "If I ever got a citation (from the FCC) I was going to FRAME IT as a QSL card". Fortunately, I am happy to announce that the FCC never sent him a "QSL" for his efforts. The beacon ceased operation in the mid 1990s.



Figure 4. Gray Bickford, WA6BJY holding the WB6DNX/R beacon on the day it was installed.
Photo courtesy of WB6DNX

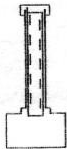
	FROM HIGH ATOP SANTIAGO PEAK DM13FR
	THE WB6DNX X-BAND BEACON
	CONFIRMING YOUR RECEPTION
	OF THE BEACON ON <u>8-2</u> -----1987.
	AT <u>1045</u> PST-GMT. <u>W6OYJ</u>
	THE TRANSMITTER IS A WAVEGUIDE MOUNTED GUNN DIODE MODULATED BY A VERACTION DIODE COLOCATED IN THE SAME WAVEGUIDE.
	POWER OUTPUT IS 100 MW. THE ANTENNA IS A VERTICAL SLOT ARRAY WHICH IS HORIZONTALLY POLARIZED.
	THE ELEVATION IS 5680 FEET ABOVE SEA LEVEL.
	THANKS FOR YOUR REPORT, 73'S <i>You ARE NO. 1</i>
	RICHARD A BREMER 1664 HOLLY ST. BREA, CALIF. 92621
	<i>BEST OF 73'S</i> <i>Dick</i>

Figure 5, QSL card WB6DNX/B to W6OYJ, August 2, 1987
Photo Courtesy of W6OYJ

Ventura makes its appearance- In addition to Bremer's beacon going on the air in the summer of 1986, another Gunn diode beacon using the call WA6EJO/B, started operation on Red Mountain, which is located 12 miles north of the city of Ventura. The beacon was constructed by Bob Schellhorn W6ORE, Steve Black WB6HCD, and Steve Noll WA6EJO, Figure 6. Each of these individuals brought their expertise to the project resulting in a beacon that was totally self designed/produced and contained many features that could be considered technological benchmarks. Bob worked at IBM and developed the controller that incorporated assembly language, Steve Black provided the RF and audio interface with the 450MHz link/control, and Steve Noll developed the power supply and distribution, the 10 GHz beacon, and the weather station (yes it reported wind speed, temp, and humidity on the 450 link). At first the beacon was ID'ed by Morse, then Noll added a

homemade voice synthesizer using a Votrax SC01 chip.

The beacon operated on 10.256GHz with an output of 140mW as shown on their QSL card (printed on Noll's HP 7475 plotter) see Figure 7.

High mountains on the north and east of the site made the application of an omni antenna a waste of power, so a small 3" X 4" horn was pointed on a heading of 140 degrees passing between the cities of Thousand Oaks and Oxnard, and down the Pacific Coast. The beacon discontinued operation in mid 1993 and is presently stored in Steve Noll's garage.

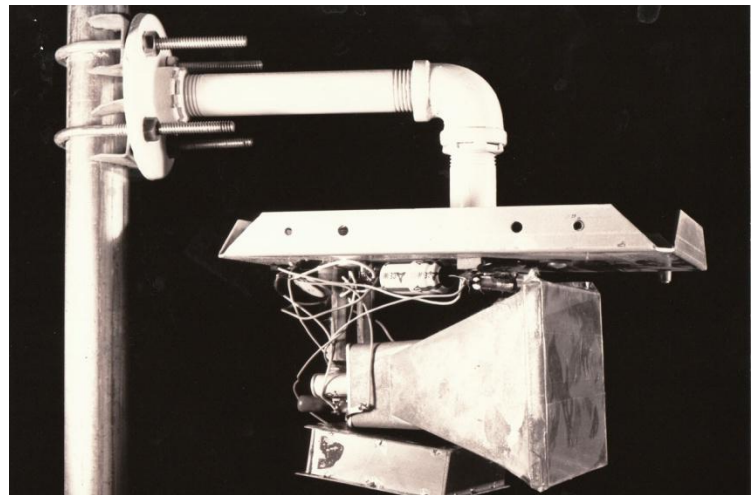
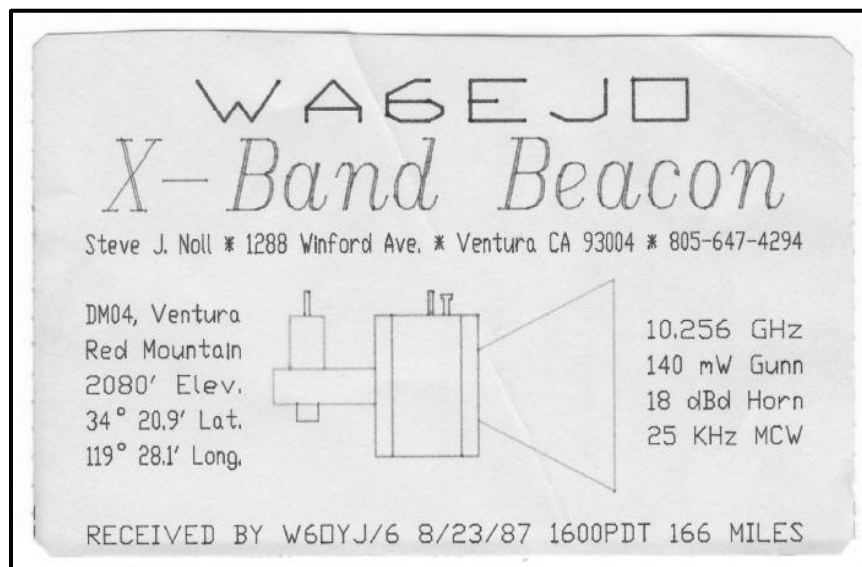


Figure 6. The WA6EJO/B beacon located on Red Mountain near Ventura. Established in 1986, it introduced many advanced features for its time. Photo courtesy of WA6EJO

It is interesting to note- the Ventura beacon was the only device to be the subject of a nationally published journal. It was authored by Steve Noll, and appeared in the January, 1987 issue of Ham Radio.

Another sidelight story of interest- as stated above the Red Mountain beacon continued to operate into mid 1993. By this time the trio of builders had gone their ways and only Steve Noll, the operator of record, remained in the Ventura area. Sometime around 1995 he happened to notice the beacon was off the air? Looking into the situation he found the beacon and its associated controller was totally missing from the Black Mountain location. After asking around, he discovered the Sulphur Mountain Repeater Association group had received permission to use the same building housing WA6EJO/B. For one reason or another, they thought Steve was a silent key, so they removed the beacon. Fortunately, they learned that he was still breathing, thus the equipment was returned to his QTH with an apologetic – "...gee, we're sorry!" Steve's interest had moved out of microwave and into the area of optics and lasers, so the beacon was never reactivated.

Figure 7, QSL card from
WA6EJO/B to W6OYJ, a distance
of
166 miles. Photo courtesy
of W6OYJ



San Diego, a new signal source- In 1986-7, Kerry Banke, N6IZW constructed a beacon, consisting of a Gunn diode signal source operating on 10.256GHz. This beacon replaced the 1983 Gunnplexer beacon built by Red Truax. It was even installed on the roof of Red's home in La Mesa. The only known photograph of this beacon is shown in Figure 8. Highway #94 and 125 are visible in lower portion of the picture.

In late 1988 Donald "Red" Truax passed away leaving the SDMG in need of a new QTH for its beacon. For approximately 6 months a 'brick' was operated from Ed Munn's, W6OYJ, home. The output was supposed to be on 10.368150GHz, however, (as Ed admitted) on a nice warm day it tended to operate below 10.3680 GHz. The beacon was connected to a 24" dish and beamed east toward the QTH's of other SDMG members. Ed used his Apple 2E to program a ROM for the beacons CW ID'er.

Ed's beacon was decommissioned when Kerry and Art McBride, KC6UQH, arranged to relocate his latest beacon from Red's house to Mt. Palomar. Housed in the PARC (Palomar Amateur Radio Club) building for the next 6 years, it served the area from Tijuana to Oceanside, but unfortunately it was blocked from radiating toward LA. To my knowledge, no pictures exist of the Mt Palomar installation.

Around 1990 two major changes took place in our world of beacons: 1) narrow band crystal controlled 'bricks' made their appearance, and 2) three new beacons appeared..... affectionately known as: Santiago, Palos Verde, and Frazer.

Santiago returns to the air- Approximately 10 years after Dick Bremer's first Santiago's beacon went off the air, Sam Luitwieler (SK), K6VLM, and Gary Dent, KE6JUV, constructed a new NB beacon for Santiago. It was located in the American Towers site and operated under the call of KE6JUV/B on 10.368330GHz.

Unfortunately, the beacon suffered from a phase noise problem, and when it stopped operating (power supply failure) in 2004, the SDMG volunteered to give it a technical face lift. The remodeling consisted of replacing the entire oscillator chain, specifically; installing a 10MHz TCXO ovenized frequency reference and a

Verticom PLL operating on 10.368330GHz.

The Verticom's signal was then passed through a HP microwave switch which allowed the operation of a CW ID'er. Drive from the Verticom was carried to the 40' level of the tower via LMR400. A Qualcomm 30dB amplifier and slotted line antenna, used in the earlier beacon, was reconnected to the new oscillator chain. Figure 9 shows the RF head of the beacon.

In 2007, Santiago was clobbered by lightning which resulted in the *smoke getting out* of the power supply, aka failure mode. Since that was repaired, the beacon has operated continuously.

Part II next month.

Thanks Greg!



Figure 8. The N6IZW/R beacon mounted on the roof of W6BLK's home. It consisted of a Gunn diode into a slotted line antenna. The Beacon was later moved to Palomar. Photo courtesy of N6IZW

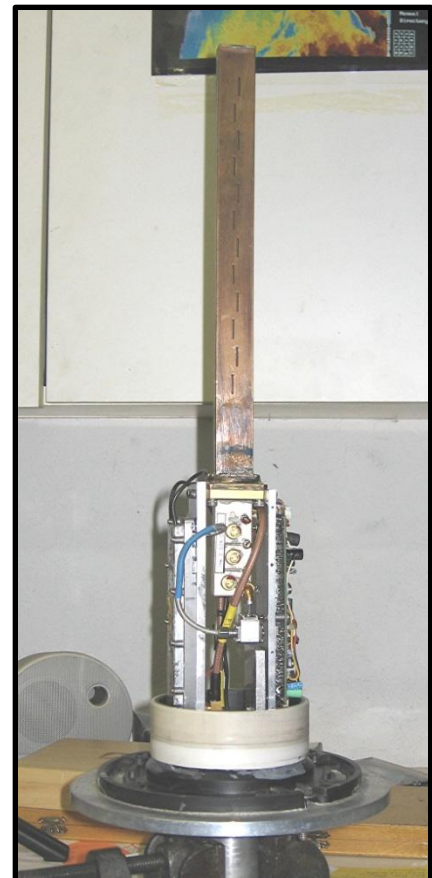


Figure 9. The present Santiago beacon as it was being rebuilt by KC6UQH in 2004. Photo courtesy of KC6UQH

San Bernardino Microwave Society 2 GHz and Up Club Contest for 2011

In the spirit of stimulating activity in the microwave bands, the San Bernardino Microwave Society (SBMS) is sponsoring a 2 GHz and Up Club Contest.

For this year, the 2011 contest period runs from 6 a.m. Saturday April 30 to 8 p.m. Sunday May 1 local time.

1. Objective

Worldwide groups of amateurs (clubs) work as many amateur stations in as many different locations as possible in the world on bands from 2 GHz through and including light.

2. Date and contest period

The contest occurs on the first weekend in May preceding Mothers Day. This weekend begins at 6 a.m. local Saturday through 8 p.m. Sunday.

3. Exchange

Six-character Maidenhead Locator; example DM04ww (see April 1`994 QST, p.86 or www.arrl.org/locate/gridinfo.html). Signal reports are optional.

4. Miscellaneous

Scheduling contacts is both permissible and encouraged.

Stations are encouraged to operate from more than a single location. A station may be worked again on each band for additional credit after a change of location. For purposes of the contest, a change of location is defined as a move of at least 16 km (10 miles).

A transmitter used to contact one or more stations may not be used subsequently under any other call during the contest period with the exception for multiple licenses in the same family sharing the same equipment (family rule). The intent of this rule is to prohibit "manufactured" contacts.

5. Scoring

Distance points: The distance in km between stations for each successfully completed QSO. One point per kilometer (e.g., 10 km is 10 points).

In making the distance calculations, a string (or ruler) and map may be used. However, calculations by computer program are preferred. Several such programs are available, including a BASIC program listing in The ARRL World Grid Locator Atlas. For purposes of making calculations, stations are defined as being located in the center of the 6-character locator sub-square (most computer programs make this assumption).

6. Multipliers

- a. 2 GHz = 2 times
- b. 3 GHz to 10 GHz times 1
- c. 24 GHz = 2 times
- d. 47 GHz = 4 times
- e. 76 GHz and up = 8 times

7. Bonus points

100 points for each unique call sign worked per band.

8. Awards

A 1st place plaque. All club entries will receive a certificate, suitable for framing.

Send entries no later than 60 days after the contest to be considered.

Submit logs via regular mail only to:

William Burns, WA6QYR

247 Rebel Road

Ridgecrest, CA 93555

For more information, rules and past scores see the SBMS web page at <http://www.ham-radio.com/sbms>



Michelle, N5NYV and Paul, KB5MU get ready for Michelle's presentation on Crystal Oscillators at the January SBMS meeting. 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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