



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 January 2011 Edition

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At the **January 6, 2011** SBMS meeting the "Tech Talk" will be on "Crystal Oscillator Heater Design" by Michelle, W5NYV, editor of the Palomar ARC newsletter Scope, member of San Diego Microwave Group and SBMS. 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

Scheduling:

December 11 SBMS Christmas Party at Dennis W6DQ QTH
Jan 22-24, 2011 ARRL January VHF Sweepstakes
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 16-17, 2011 CQ WW VHF contest
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.
January 21-22 ARRL January VHF Sweepstakes

Last meeting-Jeff, KN6VR talked about his new Agilent 3 GHz spectrum analyzer he won at MUD2010. Nice prize. Lots of features that are expandable with software. It was voted by the members present to keep the SBMS Club 2 GHz and Up contest on the same weekend before Mothers Day with similar scoring as in 2010. In 2011 that is April 30- May 1. \$2000 seed money was to be sent on to the next group sponsoring MUD 2011. The "Lab" has been rebuilt with new instruments. There will be a student trip to OVRO on 20 December. Overnight is to be at the Crystal Cove Manner Hotel in Big Pine, CA. SBMS needs another member to become a member of the American Legion so as to keep key people available. Dick, WB6DNX has Wouxun model 3 dual band HT's available for \$119

plus tax or \$130. Mel, WA6JBD brought in a lot of microwave repeater station FM gear including some 12 GHz klystrons with power supplies, lots of waveguide, and 50-500 MHz amplifiers. 22 people present.

Next month Greg, K6QPV will have an article on the Southwest Microwave beacons in the newsletter. Your article or information can appear in this newsletter if you would send it to Bill, WA6QYR at bburns@ridgenet.net.



Mel, WA6JBD and Ed, W6OYJ check out some of the 50-500 MHz CATV amplifier units.

Activity reported at the December meeting- John, KJ6HZ taught his son how to solder; Doug, K6JEY had 2 meter EME contacts from his driveway and is continuing to work on his 79 GHz rig; Jeff, KN6VR played with his new spectrum analyzer and parts for W6PQL; Larry, K6HLH continues to work WA6EXV on 10 GHz in their propagation study over mountains and had problems with his DB6NT preamp; Tisza, KI6DBR had some goody's for the group and the 50/50 drawing; Mel, WA6JBD tuned some filters; Dave, WA6CGR rebuilt the "Lab"; Dan, W6DWF is working on 24 GHz slot antennas; Courtney, N5BF worked on a W1GAC converter and a DSP-10; Michelle, W5NYV wrote up an article on the 2010 MUD and it is on the ARRL web site, worked on some software similar to MATLAB; Tom, WB6UZZ worked the audio at MUD and working on some 800-900 MHz amplifiers; Rein, W6SZ did some work on his 10 GHz rig; Walt had a talk at MUD and has a voltage to frequency amplifier from the W1GHZ site which he demonstrated with the radiometer set up; Dennis, W6DQ is having the Christmas party at his QTH; Ed, W6OYJ worked on a sequencer to slow it down; Bill WA6QYR moved another group of retiring hams gear and did some WSJT work; Chuck, WA6EXV has a FlexRadio 1500 and has a 2 meter converter in the works along with fixing his "green" bubble etcher; ATV check ins were K6BNN, AC6RB, W6KGE and a few more whom I didn't catch the call signs for.



Larry, K6HLH checks out some of the waveguide assemblies and klystron amplifier/ power supply units.

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 cshoff@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 \$60 kit, \$85 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. \$90 new condition. Can be delivered to SBMS meeting. Bill WA6QYR bburns@ridgenet.net



Bill, WA6QYR checks out some of the rack units of the microwave repeater that Mel, WA6JBD brought in to the meeting.

WA7SKT, K0CQ & The Microwave Group de K2RIW

Dear Loren, Jerry and The mw Group,

Loren asked a great Yagi Design question concerning the First Director spacing, Impedance Matching, and Gain (it's repeated below).

PAST YAGI DESIGNS -- A number of Yagi designs have used a close spacing of the First Director as an Impedance Matching Device for the Driven Element. I've been told this is one of the claims in the patent for the

F9FT antenna

designs. That was considered to be an effective method. However, the use of modern computer modeling programs (with experimental confirmation) has shown there is a better way.

SEPARATE THE REQUIREMENTS -- I say the adjustment of the Parasitic Elements should be done to optimize the Gain, or a particular Side lobe Pattern, or a particular G/T performance, or a particular Front-to-Back Ratio (the adjustments are all slightly different). The adjustment of the Impedance Match to the Driven Element is a separate and independent function, and that function should not be allowed to compromise the other performances.

WE DID IT THE HARD WAY -- In the past, many amateurs were lulled into mis-using the First Director as an Impedance Matcher. They believed achieving a good Impedance Match to the Driven Element would require a considerable amount of mechanical intervention, such as using a particular Delta Match, using a Folded Dipole Feed with different diameters for the Folded Structure, a T Match with a precise setting of the T Length, etc. We now know this is not true.

DELTA-MATCH GAIN LOSS? -- By the way, a Delta Match that is directly connected to a coaxial transmission line is not a good Balun; it creates an Imbalance that will allow the transmission line to radiate. This may be a reason such Yagis sometimes do not perform as well as expected.

A BETTER WAY -- We recently learned that achieving "a perfect impedance match" to the Driven Element (such as a VSWR of 1.05:1 or better) is rather easy.

To summarize, it simply requires three actions:

1. Select the correct Balun that creates a low-enough input impedance
2. Lengthen the Driven Element until the R component is raised to 50.0 ohms
3. Add a Shunt C to cancel the remaining +X (inductive reactance) component.

WHERE IS THE INFORMATION? -- You will find a few thousand words that better explain this Yagi (or other Dipole-like) Impedance Matching technique if you go to: <www.walmba.org> at the bottom of the first page you will find, "Yagi Impedance Matching Info", click on it. On the next page you will find, "A description of the concepts of Yagi matching", (as well as the other two Monopole Reactance Charts) click on it.

WHY THE RELUCTANCE -- When you follow this procedure, often you will end up with a Driven Element that is slightly longer than the Reflector. This seems to horrify some amateurs. They mistakenly believe a Yagi will only perform correctly if the Director is the longest Element. The Parasitic Elements do all the work -- the driven element only has to radiate in a Dipole-like manner, and present a good impedance match to the transmission line.

Jerry, K0CQ has said, "NEC simulations of Yagis don't show gain dependent much on the driven element dimensions. So the driven element details aren't modeled but determined experimentally."

WHAT IS THE BENEFIT -- Achieving a "perfect impedance match" is very desirable, particularly for EME and Satellite operations. In each case it is desirable to acquire the lowest possible Noise Figure. Your LNA will only produce the Noise Figure you saw on the Automatic Noise Figure Indicator if your antenna ALSO looks exactly like 50.0 ohms resistive.

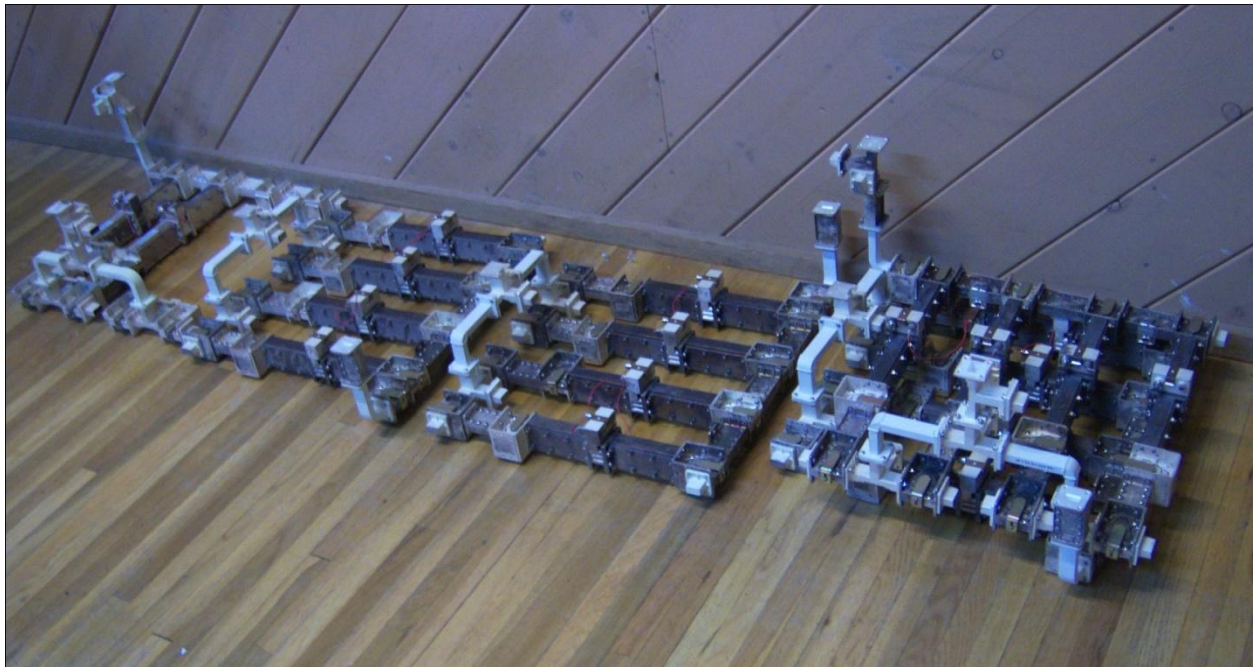
1/64 INCH YAGI REQUIREMENT? -- This may be excessive. My good friend George, W2KRM was the manufacturer of the "RIW Products" 19 Element Yagi kits. George wasn't sure of the sensitivity of the element lengths; therefore he (or someone else) may have stated this requirement. I believe that a (+) (-) 1/16 inch accuracy

is adequate for Element Lengths, as long as the error is not additive. The Element Spacing's are even more forgiving -- if it is not additive. However, the 3/16" Element Diameter is critical, and mounting the Elements with Insulated Shoulder Bushings is critical. I recommend an approximate 1/64" chamfering of the ends of the Elements. A lack of chamfering will change the apparent electrical length of the Elements, and that deficiency would be accumulative.

73 es Good UHF/SHF/EHF/EME/Satellite DX, Dick, K2RIW



Chris, N9RIN trying to decide upon which pieces to take home for his projects.



The waveguide assemblies to be taken home from the December SBMS meeting.



Chuck, N6EQ takes home a klystron heat sink.



A project that Bill, WA6QYR had at home was an old battery powered variable speed drill for which the batteries had long given out for. The drill motor was still good, so why toss out a good tool. Bill had to use a security trox wrench to open the battery pack. Inside was a group of “C” sized cells that had tab connectors on them. . These batteries had gone open or would not hold a charge any longer. So drilling a hole in the plastic case and soldering some twin lead power cord to the cell ends led to a way to external power the drill. Power pole connectors were put on the other end of the cable to allow connection to several power sources.

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 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 = 4times
- e. 76GHz 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>



Jeff, KN6VR talks about his new Agilent 3 GHz spectrum analyzer.

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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