



## 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 2007 Edition

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At the **4 January** meeting will be 47 and 78 GHz current thinking and considerations by Bob, WA6VHS and Doug, K6JEY. Bring your 47 and 78 GHz radio and parts to share your project progress. Even if you are collecting parts, bring them in to share. We will also talk about band characteristics and plans. There will be information on parts sources. 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. Check out the SBMS web site at <http://www.ham-radio.com/sbms/>.

### REMINDER- NO PARKING IN THE CHURCH LOT UNTIL CLAIRIFICATION IS MADE.

**Last meeting-** Welcome to visitors included Mike W6NJJ; Wayne, N6NB and Hank, K2GRG. Welcome to new members Ed Jones AE4TM and Wayne N6NB. The Annual SBMS February/March Spouse Dinner date and place needs setting. There was talk of purchasing a group buy of the 2006 Microwave Update proceedings. Doug, K6JEY is to be setting up a date where 24 GHz VUCC can be collected using the desert area sites. John, KJ6HZ had one of the toy speed-reading guns to show and tell. Chris, N9RIN had a show of the printed circuit board lay out and schematic capture software available from various vendors. Express PCB from ExpressPCB.com, was the easiest one to use and is free. FreePCB from Freepcb.com was more complex. KICAD was more complex than the first two. It is available from [lls.inpg.fr/realize](http://lls.inpg.fr/realize). Eagle light is the most capable from [cadsoftusa.com](http://cadsoftusa.com). Mentor Graphics that the best one but a little expensive at \$53,000 and time consuming to set up and learn. The 11 December Electronic Engineering Times had some ads for making pc boards- Otter Computer Inc [www.otterusa.com](http://www.otterusa.com). PCBFabexpress found at [www.PCBFabExpress.com](http://www.PCBFabExpress.com). Imagineering Inc had some special offers at [www.PCBnet.com](http://www.PCBnet.com) as did Accutrace Inc. at [www.PCB4u.com](http://www.PCB4u.com). PCB-Pool has free software at [www.free-pcb-software.com](http://www.free-pcb-software.com) or from their web [www.pcbpool.com](http://www.pcbpool.com). There are lots of places to get PC Boards made. 26 people present.

The **SBMS VHF contest committee** (N6DQ, N6CA, N6RMJ, WA6CGR, and KH6WZ) is reviewing the ARRL survey questions and responses. Last meeting they had an initial response to share with the group. Wayne Overbeck, N6NB, ARRL SW Division representative, was present to hear the comments. The committee will be including member comments from the meeting and adjusting the layout to agree with the suggestions. The family rule and liaison thoughts need clarification. The committee is to be placing the final version of SBMS to ARRL input on the reflector.

#### **Scheduling.**

February 2007 is still in the works.

March is still in the works too.

**Activity reported** at the 7 December SBMS meeting the following activity was reported:- Larry, K6HLH reported 1296 MHz contacts, Pat, N6RMJ had tower rig problems; Dick, K6HIJ has wire bonding machine that needs wire and had built a 78GHz 20 dB horn for JEY; John, KJ6HZ had one of the 10 GHz speed guns to show; Chip, N6CA has the 927 MHz repeater up and running, has a remote base planned for 10 and 24 GHz; Mike W6YLZ had a 2mtr/70 cm log antenna to show; Wayne, N6NB has been listening to beacons on 10 GHz and is building a multiband mobile; Michael, W6NJF has a 1296 MHz rig; Juno, KG6MOS has some test equipment trouble shooting; Jeff, KN6VR is going some 1296 amp work; Ed, W6OYJ reported on other San Diego work on optical communicators documentation; Bill, WA6QYR worked with RDR ebay amp and Jupiter GPS work; Chuck, WA6EXV built a feed for W6YLZ and is redesigning the OVRO box for 1 band per box module with antenna to have 6 boxes with bands from 1296 MHz to 24 GHz; Dick, WB6DNX is rebuilding his 10 GHz rig; Mel, WA6JBD is fixing test equipment; and Dennis, N6DQ is doing some 10 GHz work.

I'd like to report **some new DX** on 322GHz, and claim a new DX record overall for traditional RF operations above 300GHz. (i.e.: excluding light) The QSO was made by WA1ZMS & W4WWQ using slow speed CW and Spectran software.

Details of QSO:

Date: Dec 10, 2006

Time: 02:16z

Mode: FSK-CW

Frequency: 322GHz

Distance: 7.3km

W4WWQ/4 was located in FM07 at: N37-21-13.8 W79-10-15.0

WA1ZMS/4 was located in FM07 at: N37-23-09.8 W79-14-33.9

The weather at the time of the QSO was: Temp: -2C Dew Point: -17C Relative Humidity: 31% Station pressure: 1004mb These weather conditions resulted in an atmospheric loss of 4.13dB/km due to oxygen and water vapor.

The gear used for this QSO was the same gear used previously on 241/322/403GHz; that being harmonic mixers and 12" parabolic dish antennas.

This latest QSO exceeds our former DX of 1.4km as well as makes a claim for best DX on any amateur frequency above 400GHz (except for visible light).

I hope to have some photos posted on the web at [www.mgef.org](http://www.mgef.org) over the next few days.

SOME COMMENTS: A note to US amateurs that last year the FCC changed the amateur allocations from 300GHz and above to now read: "275GHz and above".

It is also my understanding that Germany remains the only country with a segmented amateur allocation above 275GHz, that being 411GHz. Can anyone confirm this?

Lastly, the ITU over the next several years will be reviewing and possibly making dedicated amateur band allocations above 275GHz. That should promise to be a positive event for amateurs worldwide.

Remember when the US ham bands used to be 30GHz and above? Look how far we as hams have come!

73, Brian, WA1ZMS/4

I posted a slideshow of pictures from today's **2006 SBMS Christmas Party** at the web address below.

Thanks to all who made it a great time. Happy Holidays, Frank WB6CWN

<http://picasaweb.google.com/wb6cwn/2006SBMSChristmasParty>

#### **Found this list in old QST Magazine.**

From QST March 1959 Column "World Above 50 Mc"

#### Records-Two-Way Work

50 Mc. LU3EX - JA6FR, 12,000 Miles 3/24/1956  
144 Mc. W6NLZ - KH6UK, 2540 Miles 7/8/1957  
220 Mc. W9EQC - W2DWJ, 740 Miles 9/17/1957  
420 Mc. G3HAZ - DL3YBA, 500 Miles 6/19/1957  
1215 Mc. W6MMU/6 - K6AXN/6, 270 Miles 9/21/1958  
2300 Mc. W6IFE/6 - W6ET/6, 150 Miles 10/5/1947  
\*3300 Mc W6IFE/6 - W6VIX/6, 190 Miles 6/9/1956 \*\*  
5650 Mc. W6VIX/6 - K6MBL, 34 Miles 10/12/1957  
10, 000 Mc. W6VIX/6 - W6BGK/6, 124 Miles 6/23/1957  
21, 000 Mc. W2UKL/2 - W2RDL/2, 14 Miles 10/18/1958  
"\*Band Now 3500-3700 Mc" (Ed note: later returned to 3300-3500)

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\*\* Note: Founders of SBMS  
73s from Ed, W6OYJ

Thread **sequencer delay times**.... Does anyone know of any really good reason to have such a delay? 73,Steve VE3SMA

Absolutely there's reasons for it.

Can you guarantee the stability of any power amplifier when you remove the load for a millisecond or two?

Suppose you time it a little bit wrong.

You want in all cases to make sure the power amplifier is completely shut down (biased off) before doing anything else.

An oscillating power amp could easily damage the final device and the TR relay.

It's also fun to have your S-meter peg when the PA oscillates and have to wait for the receiver to recover; been there done that. Any grounded grid triode is conditionally stable and you do not want to remove the load before unbiasing it.

The delay makes sure you don't do any of the above in all cases in all systems from 1 KW six-meter amps to 24 GHz solid-state amps.

I use them on every radio I have and haven't had a single failure in 20 years.

No guessing, no hoping, better to be safe.

The one thing I see others doing which I don't agree with is shutting down the preamplifier power when transmitting. I have never seen proof or any good reason to power down the preamplifier.

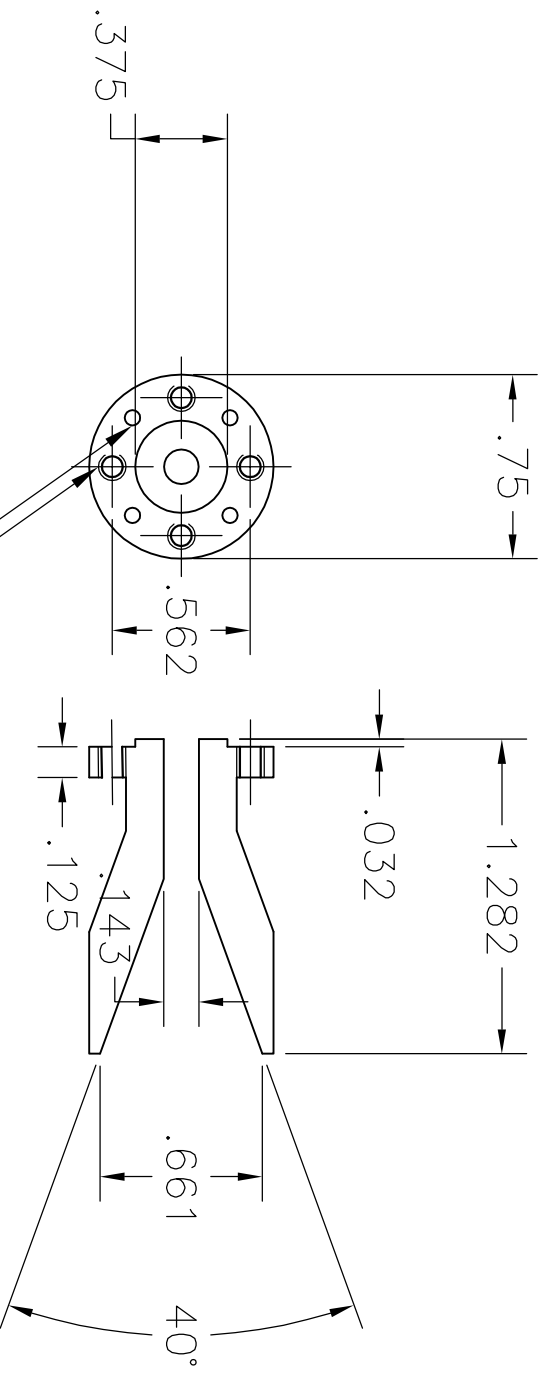
Given: absolute power handling capability of a device from the device manufacturer when a preamplifier is biased on. There is no spec anywhere on the power handling capability of any transistor or FET without power. Some preamplifiers will oscillate when applying or removing power, don't push your luck. Stick with what you know...no guessing

73 Chip N6CA

Hello Microwavers,

Here's an interesting statistic. After a steady rise, the number of logs submitted in the 10GHz and up contest peaked at 141 in 2003, declined to 136 in 2004 and declined again to 95 in 2005. This year's total at 113 reversed the trend, but still remains below the previous 5 years. See the table below. Frank WB6CWN

Year	10Ghz and Up Contest logs received at ARRL
1998	73
1999	76
2000	92
2001	120
2002	134
2003	141
2004	136
2005	95
2006	113



$\varnothing$  .085  
 (.1112) UNC NO. 4-40 TAPPED HOLE

.0625 dia 4 pl. typ.

78 GHz 20 dB Horn — K6H1J

I don't know if this has been kicked around before, but here is an interesting frequency scheme.

78.1ghz- 1.3ghz=76.8ghz. Divide that by 6 and you get 12.8ghz. 12.8 GHz bricks are not too hard to come by, but the crystals for them are now \$50 and their ovens aren't very stable. A brick at 12.8ghz takes exactly a 100mhz crystal. 100mhz OCXO's/TCXO's are pretty easy to find and cheap. I just hooked up a Vectron OCXO to the above brick and it works fine. About 200hz stability at 12.8ghz with little warm-up. So, unless you want to set a record and minimize water absorption 79.8ghz is a great frequency, but for easy to get there shorter range communications, 78.1 might be a good choice. (Thanks also to Bob WA6VHS for the idea) Doug K6JEY

#### **“Wants and Gots for sale.**

**For Sale:** 30W 1296 amplifier kit. Cost \$45, plus \$5 if sent by mail to cover cost of shipping and packaging. In So Cal, can arrange for pickup. Email [1296Amp@cox.net](mailto:1296Amp@cox.net) for more info. Chris Shoaff n9rin

Hello folks,

In line with the UK Microwave Group's policy of releasing past UK Microwave newsletters (Scatterpoint) into the public domain, the whole of the 2005 series (ten issues) is now available for anyone to download at the following FTP location:

<ftp://ftp.czdd.org.uk/ukug/2005/>

You do not have to be a member of UKuG to download and enjoy these (and ones from years before 2005) but if you wish to read current 2006 and 2007 issues then you need to become a member of the Group. Details of membership can be found at:

[www.microwavers.org](http://www.microwavers.org)

This time next year will see the 2006 editions placed on the same FTP site.

Peter, G3PHO Scatterpoint Editor

For those of you having difficulty with the ftp site try using this:

[http://www.g0czd.clara.net/ukug/SP\\_2005/](http://www.g0czd.clara.net/ukug/SP_2005/)

You can easily download the pdfs from that web URL. If you change the 2005 to 2004 you can get the issues for that year as well. This time next year the 2006 editions will also be made freely available.

Peter, G3PHO Editor of Scatterpoint (The newsletter of the UK Microwave Group)

Fellow Microwavers,

The US Geological Survey site provides a computer program to compute magnetic declination (compass variation) for any location given its latitude and longitude or given a location such as a city nearby. Now that so many of us have GPS units, once the lat/long of a place has been logged, the magnetic declination can be computed and logged as well.

The USGS site is: [www.ngs.noaa.gov/index.html](http://www.ngs.noaa.gov/index.html) under NGS Geodetic Tool Kit. Select Magnetic Declination to access the program. For example, I entered 30.228 degrees North, 097.850 degrees West, and an elevation of 780 feet and today's date of 7-23-2001. The program gave a magnetic declination for this location (in Austin, TX) as being plus 5 degrees 50 minutes, the angle measured from true North through 180 degrees with positive values being East of North and negative values being West of North. The relationship is then *True bearing = Magnetic bearing + Magnetic declination*. Note that some of the programs are downloadable.

The program responds to your input with a page titled **Synthesis Results** which has many computed values including three pages of definitions and examples to make it easy to use and interpret. This should improve the accuracy of results in aligning antennas using compasses!

As to GPS bearings as noted by Steve Bragg, the GPS unit does not give the North point directly--the GPS unit must be moved. One possible use of your GPS unit occurs to me as follows: Take the lat/long of a high point a few miles from and in view of the proposed antenna location (next to a cell phone antenna or other prominent structure that can be seen from afar) and mark as a waypoint, then proceed to the antenna site and take a second lat/long and mark as a waypoint. Set the antenna over the second

waypoint and sight (boresight) the antenna on the first waypoint. The GPS will give the bearing between the two waypoints, so rotate the calibrated dial to indicate the bearing of waypoint 1 from waypoint 2 while the antenna is pointing at waypoint 1. The zero point on the dial should then indicate the North point when the antenna is then rotated to point to zero. Obviously, the calibrated protractor (or pointer) has to be able to be rotated easily to accomplish this, so use a friction fit for the chosen moveable element. If the distance for this baseline is only on the order of a few to ten miles or so, corrections for the curvature of the earth should not be needed. An advantage to this procedure, assuming that it works as described, is that one does not have to do any advanced calculations or preparations. *I caution the reader that this procedure has not been tried, it is theoretical only, and I am not very experienced in using my GPS as yet. I welcome some enterprising microwaver to try it and report back to the community as to how well it works.* Have fun! Lloyd, N5GDB, Roadrunners Microwave Group n5gdb@texas.net email of Sept 2001

## Survey of SBMS Membership Microwave Communications Equipment

1-2007

Who can get on what bands and who still needs parts or help in getting a collection of parts to a working in the field type radio. Please take a minute and note what you have where. Bring it to the meeting to share.

<u>Band</u>	<u>Collection of parts</u>	<u>Untested Assembly</u>	<u>Field Tested Rig</u>
1.2 GHz cw/SSB/FM _____	_____	_____	_____
2.3 GHz cw/SSB/FM _____	_____	_____	_____
3.4 GHz cw/SSB/FM _____	_____	_____	_____
5.6 GHz cw/SSB/FM _____	_____	_____	_____
10 GHz cw/SSB/FM _____	_____	_____	_____
24 GHz cw/SSB/FM _____	_____	_____	_____
47 GHz cw/SSB/FM _____	_____	_____	_____
78 GHz cw/SSB/FM _____	_____	_____	_____

Name \_\_\_\_\_ call \_\_\_\_\_

Are you planning to be a rover during the next 10 GHz and Up Contest? How about the Jan or June Contest? Where do you plan to go? Got maps? GPS that reads out grid squares?

Do you need a ride-along helper? navigator? Liaison radio operator?

Will your gear operate off of 12 vdc or will you need to power up a generator?

Just some questions to think about. Come to the SBMS meeting where such things will be discussed.

### A Summary of the VHF+ Organizations

Organization names are sometimes abbreviated. For clubs, membership often extends outward some distance from the club focus area.

Group Name	URL	Interest	Region	Contact
Badger Contesters		Contests	WI	Ken Boston, W9GA; kboston@Isr.com
Central States	www.csvhfs.org	Regional	Central US	Larry Hazelwood, W5NZS; w5nzs@csvhfs.org
Digital Group	groups.yahoo.com/group/ Psk_vhf_uhf_hamradlo	Digital	International	Don Hobson, KB9UMT; kb9umt@arrl.net
Fourlanders	fourlanders.org	Contests	Southeast US	Robin Midgett, KB4IDC; kb4idc@arrl.net
K8GP	.k8gp.net	Contests	Washington, DC	Gene Zimmerman, W3ZZ; w3zz@arrl.org
Midwest VHF/UHF Society	www.celtron.com/mvus/mvus.html	General	IN/OHIKY	Gerd Schrick, WBBIFM; wb8Ifm@amsat.org Mount
Airy members.lj.net/packrats	Weak Sig	DE/NJIPA	Brian Taylor, N3EXA; n3exa@enter.net	
<b>NIMRODS</b>	<b>groups.yahoo.com/group/nimrods</b>	<b>Microwave</b>	<b>Northern IL</b>	<b>Zack Windup, W9SZ; w9sz@prairienet.org</b>
North Texas uW	www.ntms.org	Microwave	Northern TX	Kent Britain, WASVJB; waSvjb@flash.net
NE Weak Signal	www.newsvhf.com	General	New England	Del Schier, K1UHF; k1uhf@arrl.net
Northern Lights RS	nls.dropboxone.net	General	Twin Cities	Jon Platt, W0ZQ; jon.platt@gte.net
Ontario VHF	www.geocltles.com/ve3ieyl	General	Toronto	Dana Shtun VE3DSS; ve3dss@rac.ca
	Ontario VHF Association. Html			
Pacific NW	www.pnvwvhfs.org	Regional	Pacific NW	Jim Aguirre, W7DHC; secretary@pnvwvhfs.org
Roadrunners uW .	www.k5rmg.org	Microwave		
Rochester VHF	vhfgroup.rochesterny.org	General	Rochester, NY	Rajiv Dewan, N2RD; n2rd@arrl.net
Rocky Mt VHF+	www.qsl.net/lrmvhf	General	Denver, CO	Wayne Heinen, N0POH; n0poh@arrl.net
San Bernardino	www.ham-radio.com/sbms	Microwave	Southern CA	Bill Burns, WA6QYR; bburns@ridgecrest.ca.us
Six Club	www.6mt.com	Band	International	Jerry Daugherty, W9FS; w9fs@6mt.com
<b>SMIRK</b>	<b>www.smlrk.org</b>	<b>Band</b>	<b>International</b>	<b>Dale Richardson, AA5XE; aa5xe@krc.com</b>
Southeastern VHF	www.svhfs.org	Regional	out east US	Jim Worsham, W4KXY; president@svhfs.org
SWOT	www.swotvhf.org	Band	US/Canada	John Petersen, KMSES; kmSes@swotvhf.org
W2SZ	www.mgef.org	Contest	Northwest MA	Dick Frey; frey@opal.crd.ge.com
<b>W9ICE</b>	<b>w9lce.com</b>	<b>Contest</b>	<b>IN</b>	<b>Dale Schieman WB9YCZ; wb9ycz@w9Ice.com</b>
Weak Signal Group	-	--	--	Tom Whitted WA8WZG;
waSwzg@waSwzg.com				
Western States Weak Signal Group	www.wswss.org	Regional	CA & west	Paul Hammer KA6CHJ; ka6chj@arrl.net

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**The 78 GHz horn built by Dick, K6HJJ.**

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 under 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, [bburns@ridgecrest.ca.us](mailto:bburns@ridgecrest.ca.us), or phone 760-375-8566. The newsletter is generated about the 15<sup>th</sup> 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.

San Bernardino Microwave Society newsletter  
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