



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 2010 Edition

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At the **4 March 2010** SBMS meeting the "Tech Talk" will be Tony, KC6QHP talking about a wide range of activities to support the construction of a 47 GHz radio. Including; EDM machining, making waveguide switches, embedded microcontroller for TR switching, building a suitable tripod head, acquisition of hard to get parts (caps, wire bonding wire, substrates, chips, epoxies, etc.) putting together circuits with MMICs, interfacing to and from bare die MMICs, etc. 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

Last meeting. George, K6MBL gave a super talk on the development and construction of the polarplexers. Many early microwave distance records were shown with historic photographs of gear and operators. Thanks George! Visitors were David, W6KL of Burbank; Tom, KF6Q of Mira Loma; Mike, KI6OQT of Riverside; Steve, WA7LKP of Sun City. Welcome. There was discussion of places to go for tours during SBMS sponsored MUD 2010. 18 people present.

Scheduling.

13 March Spouses Dinner at Denny's Irwindale 6pm <http://atn-tv.org/wintermeeting.htm> 6550 N. Irwindale Ave Irwindale CA N34 07.981' W117 55.898

1 April-- Ed WX6DX will talk about his trip to Cape Kennedy to have a satellite launched.

16, 17, 18 April Echoes of Apollo will again take place with even more stations on the air (moon) and with Arecibo on 432 MHz. See CQ VHF for Winter 2010.

6 May Frank, WB6CWN on 24 GHz hardware. Election of officers

1, 2 May SBMS 2 GHZ and Up Club Contest

May 23-28 week IEEE conference in Anaheim Conference Center- Demos by Pat, Dennis, Brian and Walt.

SBMS sponsored MUD 2010 October 21 to 24 Cerritos Sheraton Hotel. Website is microwaveupdate.org.

Preregistration on line \$35. Hotel info on the web site. Thursday Tours. Friday talks and swap meet. Saturday talks, noise figure measurements, banquet and speaker. Sunday antenna measurements. Papers due 1 September for proceedings.

ARRL 2010 Contest Calendar

June 12-14 VHF QSO Party
June 26 Field Day
August 7-8 UHF Contest
August 21-22 10 GHz and UP contest 1st weekend
September 11-13 September VHF QSO Party
September 18-19 10 GHz and UP second half

European EME Contest Calendar 2010

March 21/22 3.4 GHz
March 27/28 144 MHz and 10 GHz + Up
April 17/18 2.3 GHz
April 24/25 432 MHz, 5760 MHz
May 22/23 1.2 GHz



George, K6MBL talking about the polarplexers and how it came about and how to build one.

Wants and Gots for sale.

For Sale- Gonset 20mtr 5 elm beam \$10; 220MHz heavy duty 7 el beam \$15; Bill WA6QYR 760-375-8566
bburns@ridgenet.net.

Wanted- info or parts/schematics for 1.2-2.4 GHz pre amp and power amplifier for color video camera. Looking for radio control airplane. Mike KI6OQT 951-515-0250.

Wanted 12" to 18" linear actuator. LarryK6HLH 661-998-3544

Activity reported at the February SBMS meeting-- Jeff, KN6VR did some 1296 MHz antenna work with elements through the boom; Pat, N6RMJ had a good contact on 1296 MHz during the contest; Larry, K6HLH had a contact with another SBMS member Ed KL7UM in Alaska on 144 MHz using WSJT mode, took down his tower to fix cold problems in 3 and 10 GHz gear; Dick, K6HIJ having problems with Qualcomm mods for 10 GHz; George, K6MBL had snow problems; Peter, K6PTL was working on tours for MUD; Walt worked on some Gunnplexer motion detectors; Dennis, W6DQ did some 1296 MHz rig work; Mel, WA6JBD worked on building some circuit boards and on measuring K6HIJ's load; Steve, WA7LKP did some Gunn oscillator work; Bill, N6MN worked on his 10 GHz station; Gary, W6KVC worked on some ATV rigs; Tom, WB6UZZ worked on some test gear; Tom KF6Q was our visitor; Rein W6SZ worked with Doug on EME; Mike KI6OQT had a 2.4 GHz camera system; Brian, AF6NA has been monitoring the Santiago beacon and building a DB6NT 10 GHz rig; Jerry, N7EME worked on MUD, Bill,

WA6QYR built a cage to hold a 1296 MHz fed on his big dish; Chuck, WA6EXV has been building and testing bill's 1296 MHz feed which has about 2db ripple on circularity (compared to about 5 db ripple measured on the homebuilt and commercial square septum feed) and some 20 db return loss, made some 10 GHz preamp boxes but had his noise figure meter quit before he could measure to see which amplifier is better; Dick, WB6DNX did some UHF stuff and worked on MUD; John, KJ6HZ had Tom WB6UZZ fix his signal generator and was over to K6JEY's to operate EME. ATV check ins included K6BNN, AF6HP and Robby in Orange.

San Bernardino Microwave Society 2GHz and Up Club Contest for 2010

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 2010 contest period runs from 6 a.m. Saturday May 1 to 8 p.m. Sunday May 2 local time.

This is a club competition in which members tally up their scores and add them with other members score to make up a club score.

1. Object

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

2. Date and Contest Period

First weekend in May. The weekend begins at 6 a.m. local Saturday though 8 p.m. Sunday.

3. Exchange

Six-character Maidenhead Locator; example DM04ww (see April 1994 QST, p. 86 or www.arrl.org/locate/gridinfo.html). Signal report is 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 (eg. 10km 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

2GHz =2 times

3 GHz to 10GHz times 1

24GHz = 2 times

47GHz = 4 times

76GHz and up = 8 times

7. Bonus points

100 points for each unique call sign worked per band

8. Awards

1st place plaque and 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.

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>

Threads

Bill Gordon dies at 92; designer of the massive Arecibo radio telescope Gordon managed construction of the device, which is 1,000 feet across, in Puerto Rico. The telescope was the first to detect ice on Mercury among other discoveries.

February 18, 2010|By Thomas H. Maugh II

Bill Gordon, who designed a massive radio telescope in Arecibo, Puerto

Rico, arranged funding, shepherded it through construction and was its first director, died Tuesday of natural causes in Ithaca, N.Y. He was 92.

Non-astronomers might not be familiar with the name of the Arecibo Observatory, but film buffs will recognize the massive dish, sunk in a limestone sinkhole in the picturesque hills of the island country and was featured in the 1997 film "Contact" and the 1995 James Bond film "Golden Eye."

<http://articles.latimes.com/images/pixel.gif><http://articles.latimes.co>

Completed in 1963, the telescope has played a major part in a number of scientific discoveries. It was the first to detect ice on Mercury, deep in craters on the poles of the solar system's hottest planet, and accurately measured the planet's rotational period. It has long been used to study radio pulsars, rapidly rotating neutron stars.

In 1974, astrophysicists Russell A. Hulse and Joseph H. Taylor Jr. used it to discover the first binary pulsar, a feat that led to a new understanding of gravitation and won them the 1993 Nobel Prize in physics. In 1990, it was used in the first discovery of planets outside our solar system, circling a pulsar in the constellation Virgo.

Gordon was not originally interested in using the telescope for astronomy.

His goal was probing the atmosphere at an altitude of 1,000 to 2,000 miles, where "weather" conditions might affect the flight of missiles and satellites. He hoped to observe the behavior of clouds of electrons, which are a measure of temperature.

But to make such measurements, he calculated he needed a dish 1,000 feet across. The largest radio telescope at the time was only 150 feet across and the largest optical telescope only 100 inches.

In the late 1950s, the Navy attempted to build a 600-foot radio telescope that could capture Russian radio signals that bounced off the moon, but it collapsed under its own weight. Anything that was light enough to move to track objects in the sky was not rigid enough to focus a signal on its collector. Gordon decided the telescope would have to be sunk into the ground for support and have a movable collector to focus the dish.

The telescope also needed to be near the equator to get the best view of the planets. In 1958, the year he dreamed up the telescope, Gordon identified the limestone pit on a tobacco farm near Arecibo that ultimately became the site. He wheedled \$10 million from the Department of Defense and construction began in 1960 and was completed three years later.

Very sad news.

The University of Illinois had an early model radio telescope which was a parabolic cylinder made out of a drained river bank just south of Danville, IL:

<http://www.ece.illinois.edu/about/history/reminiscence/400ft.html>

Later, a dish antenna was constructed at the same site. I believe it was about 150 feet in diameter. There were plans to build at least two more dishes to make an interferometer, but they never got the funding.

The Vermilion River Observatory lies in ruins now and the field station has been mostly wrecked by vandals. The dish antenna was dismantled and sold for scrap metal about 8 years ago.

:(73, Zack W9SZ

Hi Bill,

I am saddened to hear of the passing of Jim W6ASL. He was a good friend and will be missed. I will throw my hat in the 'old timers' ring. I have been W6HCC for 63 years. My first rig was a Meissner 'signal drifter' driving an RK 4D32 on ten meters running 'narrow minded' FM. My first VHF rig used an HY615 super-regen detector on 2 meters. My first microwave ham activity was with a phase locked klystron on 10 Ghz. It's been a great ride!!

I am attaching my southern grid trip 'OPERATION GRAND SLAM' The grid count on 432 Mhz is 71 grids and 68 grids on 1296 Mhz. 73 Phil, W6HCC

Call for Papers and presentations for the **36th Annual Eastern VHF/UHF Conference** April 16, 17 & 18th, 2010
Crowne Plaza Hotel, Enfield, Ct.

The NorthEast Weak Signal Group (NEWS) is calling for the submission of papers and presentations for the upcoming 36th Annual Eastern VHF/UHF Conference to be held once again at the Crowne Plaza Hotel in Enfield, Ct. on April 16, 17 & 18th, 2010. Papers and presentations are solicited on both the technical and operational aspects of VHF, UHF and Microwave weak signal amateur radio.

In general papers and presentations on non weak signal related topics will not be accepted but exceptions may be made if the topic is related to weak signal. The deadline for the submission of papers and presentations is March 15, 2010. All submissions for the proceedings should be in Microsoft Word (.doc) or PDF formats. Submissions for presentation at the conference should be in PowerPoint (.ppt) format, and delivered on either a USB memory stick or CDROM or posted for download on a web site of your choice. Pages are 8 and 1/2 by 11 inches with a 1 inch margin on the bottom and 3/4 inch margin on the other three sides. All text, drawings, photos, etc. should be in color if possible for inclusion in the Conference Proceedings CD. Station photos and rover operations are welcome.

Please indicate when you submit your paper or presentation if you plan to attend the conference and present there or if you are submitting just for publication. Papers and presentations will be published in a CD format conference proceedings. Send all questions, comments and submissions to the program chair, Bruce Wood N2LIV via N2LIV@optonline.net.

We will have a Hospitality Suite for early arrivals on Friday Evening starting at 7:00PM to 11:00 PM. Conference registration will begin on Saturday at 7:30 AM and talks and band sessions will start at 8:30 AM. A banquet dinner, Trivia quiz and prize raffles will begin at 7:00 PM. On Sunday an outdoor flea market, weather permitting, will begin at 8:00 to 11:00 AM. Starting this year flea market admission will be FREE for both buyers and sellers. VHF and above relate equipment items only..

We are planning several auctions both in the morning and afternoon sessions to help raise money to help defray costs of future conferences. If you have any decent shape equipment you would like to donate please bring it along to help support the cause and to clean out your shack.

- Compliments of Greg WA1VUG and R&S we will have the following test capabilities available at the conference: If you want things to happen we need your HELP- see below!!!

R&S ZVA and ZVL Vector Network Analyzers for component test (filter responses, amplifier gain vs. freq, etc.) from 9 kHz to 40 (hopefully 50) GHz R&S FSUP Signal Source Analyzer for phase noise measurement of oscillators to 26 GHz (hopefully 50 GHz) R&S FSQ Spectrum Analyzers for Noise Figure measurements (to 24 GHz) and spectrum measurements (harmonics, spurs) to 26 GHz R&S FSH handheld Spectrum Analyzer/Vector Network Analyzer for antenna measurements/transmission line fault measurements (mobile installations)

We are looking for a few volunteers to help Greg and watch the equipment when he takes a break. Also, we need a few 12v power supplies, soldering station, solder and small tools and jumper cables to assist the measurements. If you can help please email me N2LIV@optonline.net

Registration is now open for this years conference on April 16, 17 & 18th, 2010 in Enfield, Ct. A block of Hotel Rooms is available at the Crowne Plaza, Enfield under the NEWS group for \$99. Call fo local in-house hotel registration.

SEE OUR WEB SITE FOR FUTURE INFORMATION & PAYPAL or MAIL REGISTRATION.

<http://www.newsvhf.com/vhfconf.html>

Further info to follow as it develops. Thank you,
Bruce N2LIV Conference Chairman

Laser issues in ham bands above 300 GHz VUCC issues

I work with lasers and high power optical sources, professionally. I have a CDRH variance for outdoor use and have done the FAA paperwork for lasers in airspace. I know several NYS Class B licensees. I called a friend who has a

current class B. His reply, keep the power low and go have fun. NYS rules are labor law, and very much unfair for small laser applications IMHO. There are exceptions for low power educational use, ie you don't see every physics teacher in NYS paying 300\$ for an inspection, exam, and driving to a retinal exam in Albany.

I also am unaware of anyone other than a professional user EVER registering a small laser in NYS.

Keep the power under say 15-20 mW, use a non Qswitched laser, keep the beam horizontal, out of navigable airspace, and go have fun! navigable airspace is defined in this case as above 700 feet. I would NOT conduct operations within 7 miles of a airport runway centerline per FAA 7400.

I'm not going to get into the reasons for my choice of power level above, but suffice it to say its based on considerable years of laser safety experience.

Pilots are required to report you IF they can see the beam. Unless its a very foggy night, your NOT going to see side scatter from 25 mW at .65-1.0 mm diameter (average diode or gas laser) much more than a few dozen feet away.

Our requirements for doing permitted laser shows in public are simple.... 3 meters up and two meters horizontal from the highest public access point in the venue.

HAM Meaning: keep the space around your tripod controlled, keep power low, and precalculate where your target is.

Your going to be expanding the beam anyways, and the safety calculation is NOT total power, its power into a 7 mm pupil area for the eye and a 50 mm area for optically aided viewing.

If you give me divergence in milliradians, wavelength, and power, I'll be glad to try to calculate your nominal ocular hazard distance (NODH) sensitive zone exposure distance (SZED) and critical Zone Exposure distance (CZED) per the current rules, but please note my software is not that accurate under 100 mW or less than .1 mR.

Aiming beams for most eye surgery lasers are 3-5 mW anyways, and that is tightly FOCUSED on the retina.

Despite the recent problems with laser pointers and aircraft, you have a major difference, your communicating with a target some distance away, this gives you a real purpose for having the laser, and law enforcement looks on this differently!

The 4.95 mW class IIIA visible limit for public devices is based on blink reflex in a uncontrolled environment, for a certain amount of damage in N exposures, and N is a BIG number.

If I told you how small the number of enforcement officers for laser safety is, you'd be shocked.

Some place above 50 mW, or for unattended operation over very long distances, I'm going to get concerned about federal paperwork.

Keep the power down and go have fun!
Steve N8VKD.

On May 20 Japan is planning to launch four "CubeSats". The largest of them, UNITEC-1, will carry a 15 watt Amateur Radio 5840.00 MHz telemetry beacon and travel into deep space towards Venus

Three of the satellites will carry Amateur Radio payloads. On the AMSAT bulletin board Mineo Wakita JE9PEL writes

Four CubeSats in Japan are planned to launch at 20 May 2010 together with PLANET-C which belongs to JAXA by H-IIA rocket.

http://www.jaxa.jp/index_e.html

UNITEC-1, NPO UNISEC (University Space Engineering Consortium)

5.8GHz

<http://www.unisec.jp/unitec-1/en/top.html>

Nagai*", Soka University

437.305MHz CW, Packet 1200bps FSK AX.25

<http://kuro.t.soka.ac.jp/main.html>

WASEDA-SAT2, Waseda University
437.485 MHz CW(FM), PCM-FSK(FM) 9600bps
<http://www.miyashita.mmech.waseda.ac.jp/Waseda-Sat2/index.htm>

KSAT, Kagoshima University
Uplink: S-band(2GHz, 10kbps), Downlink: Ku-band(13.275GHz, 10kbps/1Mbps)
<http://www.sci.kagoshima-u.ac.jp/~nishio/download/Ukaren2008Nishio.pdf>

IARU Amateur Satellite Frequency Coordination information
Unitec-1 http://www.amsat.org.uk/iaru/finished_detail.asp?serial=141
Negai http://www.amsat.org.uk/iaru/finished_detail.asp?serial=90
WASEDA-SAT2 http://www.amsat.org.uk/iaru/finished_detail.asp?serial=123
AMSAT Bulletin Board AMSAT-BB
<http://www.amsat.org/amsat-new/tools/maillist/>

AMSAT-UK publish a colour A4 newsletter, OSCAR News, that is full of Amateur Satellite information.
Join online at https://secure.amsat.org.uk/subs_form/

73 Trevor M5AKA

Daily Amateur Radio News (Email/RSS): <http://www.southgatearc.org/> Email Your News To: editor at southgatearc.org Or Use Form at: http://www.southgatearc.org/news/your_news_1.htm

This satellite holds some promise of a decent and doable microwave technical challenge.
It will be possible to use our 5760 Transverters for a RX only application, maybe with minor tweaking.
The LO is 5616 MHz, with the RF of 5840 MHz, the IF is 224 MHz, right in the US 222 MHz band.
Maybe with a bigger dish, and a very low noise figure preamplifier, optimized at 5840 MHz, we could be in the UNITEC-1 deep space telemetry collection business.
The DEMI A32 LO with an external 10 MHz reference, can add the frequency stability needed.
Or maybe Steve, N5AC, can preprogram the A32 for a $5,840-145 = 5,695 / 5 = 1,139.0$ MHz
A reasonable challenge this winter morning, as I sip my lukewarm tea at the dining room table.

But more questions are raised:

1. Keplerian elements are great for satellites, but once UNITEC1 enters deep space, what do we use to calculate and predict the path for our accurate tracking ?
 2. Is there anything special about the modulation scheme ?
- Stan, W1LE Cape Cod FN41sr

14th International EME Conference Announcement

It is with great pleasure that W5LUA, VE4MA, WA8RJF and the North Texas Microwave Society officially announce the 14th International EME Conference.

We cordially invite you and your family to Dallas, Texas on the 12th, 13th and 14th of August 2010 for the premier technical and social EME event of the year. Whether you are an experienced EMEer or new to the lunatic fringe, the conference will offer a wide range of technical, social and site-seeing activities for everyone.

The Conference Hotel is The Westin at the Dallas Fort Worth Airport which is just a short shuttle ride from DFW Airport and offers first class conference amenities at an excellent conference price of \$89 USD per night plus taxes. Their address is 4545 West John Carpenter Freeway, Irving, TX 75063. We have guest rooms booked for Wednesday night through Saturday night. The conference rate is only good for Wednesday through Saturday for either a single bed or double beds. Please book your room directly with this hotel as it helps the conference organizers meet our hotel commitment and help offset the price of conference meeting rooms and other amenities. We expect a large turnout and strongly recommend that you book early to avoid disappointment. The hotel block will be held until July 12, 2010. After July 12th, it will be difficult to get the same conference rate. Hotel registration is now available online at

<http://www.starwoodmeeting.com/StarGroupsWeb/res?id=0902108016&key=7BF3D>
<http://www.starwoodmeeting.com/StarGroupsWeb/res?id=0902108016&key=7BF3D>.

If you have any difficulties in using the on-line Westin hotel registration, please call reservations at 888-627-8617 and reference the "EME Conference"

to get the conference rate. If all else fails please drop Al a note at <mailto:w5lua@sbcglobal.net>
w5lua@sbcglobal.net.

The Dallas-Fort Worth area offers a wide range of holiday/vacation activities. Plan on arriving at the conference hotel Wednesday afternoon or evening. We will have a hospitality suite and registration on Wednesday evening so we can get acquainted and prepare for a full day of family activities on Thursday. The Thursday family activities will include air conditioned bus tours in the Dallas Ft.Worth area. Yes it will be hot in the Texas in August but we do have well air conditioned buses, hotels and buildings! We are working with two local tour companies at present to find the best activities and best deal for our group. Once the details are known (which should be within a few weeks) we will go forth with the conference registration and fees. While the technical sessions are going on during the day on both Friday and Saturday, we plan two full days of family activities.

On Friday evening we have planned a fun filled evening in Ft.Worth. We will have a Saturday night banquet at the hotel with a special guest speaker planned. We will have a short session on Sunday morning to wrap things up and then you are free to continue your travels. We hope that you can make the Dallas Ft.Worth area the center of your 2010 vacation or just a stopping point as you tour other parts of North America. The Dallas Fort Worth area is served by DFW International Airport making international travel easy while still a convenient jumping off point to other destinations within the U.S.A. or Canada.

The hallmark of past EME conferences has been the excellent technical presentations and the 14th EME Conference promises to live up to everyone's expectations with an outstanding technical program. To date presentations on the following topics by an international cast of EMERs include:

- Low Noise Amplifiers
- Tracking the Moon and other celestial bodies
- SSPAs/Tube Power Amplifier/TWT Workshop
- Receiving with Software Defined Radios
- Big Dish EME
- Highlights from several DXpeditions.
- Getting started with a small dish on 1296 EME
- Feed design and construction
- EME Propagation
- Software
- Live EME demo on 1296 MHz by WA5WCP/5

Of course no technical portion of a Conference is complete without the Technical Proceedings and the 14th EME Conference Proceedings will be second to none. If you would like to present or submit a technical article for inclusion in the Proceedings please contact a committee member as soon as possible.

We also have several electronic vendors signed up to showcase their goodies. The vendor rooms will be open all day Friday and Saturday. If you are interested in obtaining a vendor table, please contact us as soon as possible before the start of the conference.

We will also have noise figure measurement equipment on hand to showcase your newest low noise amplifier or to help you troubleshoot a troubled LNA.

A special request: Most EMERs would argue that EME is the most interesting, challenging and rewarding aspect of Amateur Radio. The EME Conference presents not only an opportunity to swap lies with old friends or make new friends but it also presents each of us with an opportunity to share our passion for that unique aspect of Amateur Radio called EME with others. We encourage you to invite any and all who may have an interest in EME. Whether you are a seasoned EMEer or just someone wishing to see what all the fun is about on the higher frequencies, this conference is for you.

Whether this will be your 1st EME Conference or your 14th we are looking forward to seeing you in Dallas in August 2010.

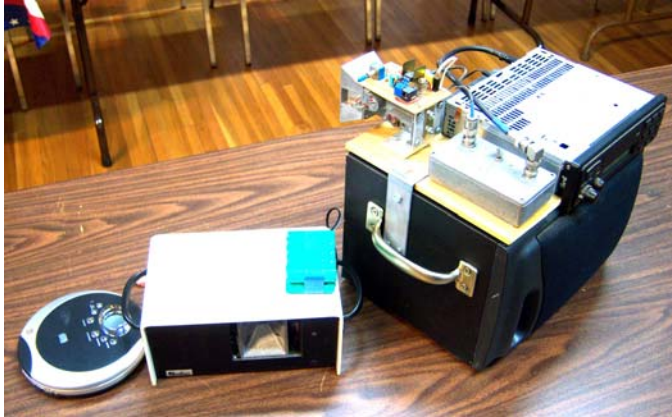
73 and GUD DX (via the Moon)

Al Ward W5LUA

Barry Malowanchuk VE4MA

Tony Emanuele WA8RJF

January 15, 2010



Walt's AM 10 GHz microwave demonstration gear at the February 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 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, 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.

San Bernardino Microwave Society newsletter
247 Rebel Road
Ridgecrest, CA
93555
USA