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 2012 Edition

At the **February 2, 2012 SBMS meeting Probst, HB9AZN will talk about prorogation predictions and sources of materials**. 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.

Last meeting- Walt had a great talk on antenna noise. He talked about how a radiometer works in measuring the temperature emitted from various sources depending upon their wavelength. Walt talked about how to go about finding the focus of a dish antenna using various methods. And finally he covered how noise can be generated by the feed struts and the back of the dish. Thanks Walt for sharing these ideas. Paul, KH6HME was in to the mainland from Hawaii for his annual visit. Our visitors were Art Boondry, WB5NCE from Fullerton; Dave Held, WA6PHS from Redondo Beach and Randy Oats, W6OAR from Victorville. The SBMS Christmas party at Dennis' house W6DQ was attended by a good number of folks. The proceeds from the Christmas party (some $300) went to a Corona food bank. Pat, N6RMJ talked about his 10/24 GHz rig he had present where he had modified the feed to hold the DB6NT 24 GHZ portion of the set up so the losses were minimized. The 10 GHz part was condensed down to make the whole rig much smaller and compact for transportation and set up. Now it is just the 3 ft dish with one multi-pin connector that slides into a V slot on the tripod that has the 10 GHz transverters and the IF radio. Nice job, Pat! It was sadly reported that Gene Monroe, K6BNN had passed away over the Christmas time. Dick, WB6DNX reported that he is still waiting for the 3W 10 GHZ amplifier from Northern CA. The projection screen installation has been delayed due to holiday activities of the American Legion in their hall. Bill, WA6QYR had a reminder for members that the 2 GHz and Up contest is coming up in May. So everyone needs to get their rigs out and try them out before it gets too late for those fixes and modifications. The 2 GHz club contest is 5-6 May. Pat, N6RMJ brought up that the EME conference for 2012 has opened its web site for registration for the August 16-19 event. Dennis, N6DQ reported that he had received a letter inviting SBMS to come to the Desert Hamfest January 28 in Palm Springs and bring some demonstrations.

Scheduling:

January 21-23 ARRL January VHF Sweepstakes
March 1 Wattmeter session to check the calibration of you power reading devices. Doug, K6JEY will have available an accurate means of measuring to 1.5% of reading at the 10, 50 and 100 watt levels on 432 and 1296 MHz. This is different than most meters that are some percentage of full scale. So bring your power measuring units to the meeting to get them checked. Doug will have terminations available for through type meters. If you have a low range meter such as an HP 431 type meter there will be 30 dB attenuators to put in front of your instrument.
March 3-4 Dubus EME 432 MHz & 3.4 GHz 00-24z
March 31- Apr 1 Dubus EME 144 MHz & 10 GHz 00-24z
April 21-22 Southeastern VHF Society Conference Charlotte, NC www.svhfs.org
Apr 28-29 Dubus EME 2.3 GHz 00-24z
May 5-6 SBMS 2 GHz and Up Club Contest
May 26-27 Dubus EME 1.2 GHz 00-24z
June 9-10 ARRL June VHF QSO Party
June 23-24 Dubus EME 5.7 GHz 00-24z
June 24-27 Society of Amateur Radio Astronomers 2012 Conference National Radio Astronomy Observatory Green Bank, WV. www.radio-astronomy.org
August 4-5 ARRL August UHF Contest
August 18-19 ARRL 10 GHz and Up contest part 1
August 16-19, 2012 The 15th International EME Conference in Cambridge, England.
September 8-10 ARRL September VHF QSO Party
September 15-16 ARRL 10 GHz and Up Contest part 2
October 18-21 Microwave Update 2012 in Santa Clara Biltmore Hotel

Wants and Gots for sale.
For Sale: 30w 1296 MHz PA kit $50 + $5 for US shipping Chris Shoaff, N9RIN cshoaff@yahoo.com
For Sale: 10 GHz slotted waveguide antennas $55 kit, $80 assembled plus shipping Dan W6DFW W6DFW@apex-scientific.com
For Sale: 4 turret microscope $25; Carl Zeiss surveyors level $50; 16 element 2 meter skeleton slot antenna, $15; 8 ft solid aluminum dish, $75 (can transport to your site for mileage.); 6 ft fiberglass dish $25; 7.5 ft TVRO dish $20; 6ft motorized Az/El RV TVRO dish with control box $20; 10 ft TVRO mesh dish $10; 10 to 20 ft aluminum thin wall pipe diameters from 1 inch to 4 inch (old HF full size beam parts); two HP 5360A non-working computing counters with input module/keyboard with manual- free; 120v 20a variac $20 Bill WA6QYR bburns@ridgenet.net 760-375-8566.
For Sale- lots of microwave stuff. Let me know what you need. John KJ6HZ 951-288-1207.
Wanted- 30-40 dB 25-50w attenuator W6IEE.73@gmail.com
For Free- four 4 ft channel master dishes Pat, N6RMJ 661-755-1773 n6rmj@sbcglobal.net.
For Sale – new SMA attenuators DC-18 GHz 6dB and 20 dB $5 each Dick 714-529-2800 rabremer@juno.com.

Larry, K6HLH reported the purchase of step down and step up switching regulator boards on ebay. For around $2 each you can get an assembled board with parts for less than the cost of the parts from Hong Kong with free shipping. Adjustable voltages on the output with a couple of amps. For step down regulators search for LM2596 then narrow the search down to the lowest price. Larry got 5 for $10.50. For step up regualtors search for LM2577 at a little more cost. You will want to add a heat sink if you are looking for several amps service.

Activity reports: Doug, K6JEY is building a 140 GHz rig and now has a K3 line amplifier; Brian, AF6NA now has a 5.5 ft dish for EME; Chuck, WA6EXV has his bubble eacher working with "green" chemicals and is the final stages of getting his 6 mtr to 144 MHz transverter working with his Flex-radio; Bill, WA6QYR is getting contacts with his 5w WSJT rig on 20 meters; Ed, W6OYJ reported that all the San Diego beacons are working; Walt 377ohms did experiements with his radiometer; Bill, N6MN did some 24 GHz work; Paul, KH6HME reported the 2011 year was the poorist propagation in 40 years for the mainland to Hawaii; Tom, WB6UZZ worked on some feed antennas; Wayne, N6NB is planning a DX-pedition to East Texas for the VHF contest; Mel, WA6JBD reported that his 840 KM 10 GHz contest contact was the longest in the contest; Larry, K6HLH had his computer die and is working on 2.3/3.4 GHz rigs; Jason, W6IEE picked up a 6 ft dish; Dave, WA6CGR si building a 10 GHz rig for his

wife; Pat, N6RMJ worked on a 10 GHz amplifier for Brian; ATV checkins were- KB6CJZ, KE6BXT and KA6DPS. 27 people present.

Pat N6RMJ with the front end of the dual band 10 and 24 GHz rig. On the feed arm is the 3 w 24 GHz transverter portion of the rig modification.

Pat, N6RMJ with his dual band 10 and 24 GHz rig. The 24 GHz section is seen on the feed arm while the IF radio and 10 GHz section is just above the tripod head. Nice modifications to the previous single band rigs.

Wayne, N6NB, Rein, W6SZ, Jeff, KN6VR and Larry, K6HLH talk at the February SBMS about the affairs of the world.

[Mw] **how to test microwave relays?**
Date: 1/07/12 @ 7:15:16 pm
From: "Tyler" <tyler881@comcast.net>
To: microwave@lists.eclectechs.com

Hello! I'm trying to get a 1.2 GHz station together before the contest. I have a few different SMA coax relays. They all go "click" when I put power on them.

I do not have a nice analyzer of any kind that would let me see insertion loss through them.

Is there a common failure type that can be easily seen with a multimeter? Would a check of the DC resistance of the ports be worthwhile?

Thanks! Tyler KM3G

Subject: [Mw] K2RIW: How to test microwave relays?
KM3G es The Microwave Group de K2RIW 1/07/12
Taylor et al.,

THE DIRECT, INSERTION LOSS TEST
The best test of a relay would be by using laboratory equipment that can resolve 0.05 dB of delta insertion loss at 1.2 GHz, and "click" the relay 10 times while performing the test. Almost none of us have that test equipment!

HERE'S THE NEXT BEST TEST -- A KELVIN CONNECTION assuming that the relay is rated for the 1.2 GHz frequency region, the only thing left to confirm is that the internal contacts of your "used relay" come together with the right amount of conductivity -- which you CAN confirm, with some smarts. You just have to measure the "contact resistance" in milli-ohms.

Your ordinary ohm meter may not be able to do that. Just bringing the test leads together will give you a scratchy, non-repeatable, contact resistance of about 0.3 ohms. That amount of ohm meter resistance added to the relay contact resistance (conductance) will give a reading that is a "necessary", but it may not "sufficient".

However, you DO own the equipment that will allow you to measure the milli- ohms of contact resistance. It's called "Four Terminal Sensing" or a "Kelvin Connection" Ohm Meter Test. If you view the following web sites, you will understand the theory, and you will be able to assemble the correct test equipment.

TEST EQUIPMENT
It requires (1) a power supply, (2) a series resistor (to control the current), and (3) a Digital Voltmeter that has a milli-volt scale.

The ideal power supply for this test would be a "Constant Current" type, and some of us own one of these. You can make a substitution by choosing a large enough power resistor, and place it in series with your power supply.

REFERENCES
These web sites will explain the theory of operation. The first two are very good; the next four will also give you some further hints:
http://en.wikipedia.org/wiki/Four-terminal_sensing
http://www.allaboutcircuits.com/vol_1/chpt_8/9.html
http://websrv.mece.ualberta.ca/electrowiki/index.php/Kelvin_Connected
www.caddock.com/Online_catalog/Mrktg_Lit/TypeSR.pdf

http://www.edn.com/article/471691-Improved_Kelvin_contacts_boost_current_sensing_accuracy_by_an_order_of_magnitude.php
http://www.cypress.com/?id=4&rID=46431

FINAL NOTES
The only remaining problem is that the "leads" (the female SMA center Connectors) on your relay are not long enough to conveniently make a two-lead connection at each connector. Therefore, your measurement will include the resistance of the SMA center pin connection of your "male SMA Test fixture"
That makes contact with each SMA connector on your relay.

Your next question will probably be, "How much resistance is acceptable". My guess is less than 0.42 ohms (inside the relay) would be great. I arrived at that number by the following assumptions:

(1) A good SMA relay doing "cold switching" (no RF present during the Transition) can probably tolerate 30 watts at 1.2 GHz. 30 watts on a 50 ohm line will cause a current of 0.775 ampere rms.
P = (I^2)*R
Or I = Square Root of (30/50) = 0.775 ampere.

(2) I assumed that the relay internal contacts can dissipate 0.25 watt without burning up.
Maximum Allowable R = (Watts Dissipated) / (I^2) R Maximum = (0.25 watts) / (30/50) = 0.42 ohms.

Tyler, if you perform this test, please let us know how it turned out.

73 es Good UHF DX,
Dick, K2RIW

Call for Papers 16th Annual Southeastern VHF Society Conference in Charlotte, NC.

The Southeastern VHF Society is calling for the submission of papers and presentations for the upcoming 15th Annual Southeastern VHF Society Conference to be held in Charlotte, NC. on April 20th and 21st, 2012. Papers and presentations are solicited on both the technical and operational aspects of VHF, UHF and Microwave weak signal amateur radio. Some suggested areas of interest are:

Transmitters

Receivers

Transverters

RF Power Amplifiers

RF Low Noise Pre Amplifiers

Antennas

Construction Projects

Test Equipment And Station Accessories

Station Design And Construction

Contesting

Roving

DXpeditions

EME

Propagation (Sporadic E, Meteor Scatter, Troposphere Ducting, etc.) Digital Modes (WSJT, etc.) Digital Signal Processing (DSP) Software Defined Radio (SDR) Amateur Satellites Amateur Television

In general papers and presentations on non weak signal related topics such as FM repeaters and packet will not be accepted but exceptions may be made if the topic is related to weak signal. For example, a paper or presentation on the use of APRS to track rovers during contests would be considered.

The deadline for the submission of papers and presentations is March 1st, 2012. All submissions for the proceedings should be in Microsoft Word (.doc). 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 ¾ inch margin on the other three sides. All text, drawings, photos, etc. should be black and white only (no color).

Please indicate when you submit your paper or presentation if you plan to attend the conference and present your paper in person, or if you are submitting solely for publication. The technical program is being handled by Robin Midgett K4IDC. Send all questions & comments to Robin Midgett K4IDC via K4IDC at comcast dot net.

Chuck, N6EQ; Randy, W6OAR; and Paul KH6HME talk at the February 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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