

N.E.W.S. LETTER

The Publication of the North East Weak Signal Group

July, 2012

Volume 21

Issue 4

*****SAVE THE DATE*****

Combined Mid-Atlantic & Northeast VHF Conference Sat Oct 13

Marriott Courtyard Hotel, Bensalem, PA

Friday night table-top flea mart & Hospitality

Saturday: Conference presentations and Banquet dinner + door prizes

Sunday AM: Parking lot tailgate

\$35 Early Bird registration + \$35 for banquet

Full details to follow soon.

Check the Packrat website: <http://www.packratvhf.com/>

NEXT MEETING: July 14th, 2012

CLUB PICNIC

MDS and ERP Tests: 10 & 24 GHz.

June VHF contest - special prize to highest scoring NEWS member.

Prize will be presented at NEWS picnic. You must be there.

Please send scores to w1ghz@arrl.net

DON'T FORGET

The North East Weak Signal Group

2 Meter VHF and Above Net

Every Thursday at 8:30 PM local 144.250 MHz.

W1COT, WZ1V or K1PXE Net Control

MEMBERSHIP in the N.E.W.S Group is \$15 per year. Apply to Tom Williams, WA1MBA.

Email [tomw\(at\)wa1mba.org](mailto:tomw(at)wa1mba.org) You may download an application from our web page:

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

The N.E.W.S. LETTER is the publication of the North East Weak Signal Group. Articles may be reprinted with proper credit given to the author and the N.E.W.S. LETTER. Send articles to Tom Filecco W1WSO, via email to w1wso@comcast.net.

2012 North East Weak Signal Group VHF CALENDAR:

July 14, 11AM - 4PM - [N.E.W.S. Group Picnic](#)
July 21-22, 1800Z - 2100Z - [CQ Worldwide VHF Contest](#)
August 4-5, 1800Z - 1800Z - [ARRL UHF Contest](#)
August 11, 2300-0300 UTC - [50 MHz Fall Sprint](#)
August 12, 0400Z - Perseids meteor shower
August 18-19, 6AM - 11:59:59PM - [ARRL 10-GHz & up Cumulative Contest](#)
September 8-10, 1800Z-0300Z - [ARRL September VHF QSO Party](#)
September 15-16, 6AM - 11:59:59PM - [ARRL 10-GHz & up Cumulative Contest](#)
September 17, 1900-2300 Local - [144 MHz Fall Sprint](#)
September 25, 1900-2300 Local - [222 MHz Fall Sprint](#)
September 29, 1PM - 4PM - [N.E.W.S. Group Meeting](#)
September 30 - [Mt. Airy \(PackRats\) Hamarama](#), Wrightstown, PA Fairgrounds
October 3, 1900-2300 Local - [432 MHz Fall Sprint](#)
October 12-14 - [Mid-Atlantic \(PackRats\) / Eastern VHF joint Conference](#), Bensalem, PA
October 12-13 - [New England Amateur Radio Festival - Deerfield, NH](#)
October 13, 0600-1200 Local - [Microwave Fall Sprint](#)
October 18-21 - [Microwave Update hosted by 50MHZ & UP Group](#), Santa Clara, CA
November 17, 1PM - 4PM - [N.E.W.S. Group Meeting](#)
November 18, 0500Z - Leonids meteor shower
December 13, 0100Z - Geminids meteor shower

For Sale

2M 250W output linear PA using BLF278 FET, mounted on oversized heatsink \$200. Includes two 50W input pads for adjusting to drive of 5W to 25W. Specs at <http://stores.ebay.com/RF-Source-Lab>.

Contact WZ1V@ARRL.NET

2012 Joint VHF/UHF Conference

The Joint Mid-Atlantic and North East VHF Conference is hosted by The Mt. Airy VHF Radio Club (Pack Rats) and North East Weak Signal Group (NEWS).

Saturday October 13, 2012

Marriott Courtyard Bensalem
3327 Street Road
Bensalem, PA 19020
215-639-9100

Call for Papers

Papers and presentations are being requested. Please submit in electronic format to:

Rich KB3NRL renwright@verizon.net

Paul W1GHZ w1ghz.vt@gmail.com

Rick K1DS rick1ds@hotmail.com

Weekend Agenda

1. Special Hotel Room Rate for Attendees
2. Friday Night Hospitality and Table-top Fleamarket 7-10PM at Marriott Courtyard - LIMITED SPACE FOR ATTENDEES ONLY
3. Saturday Conference - 8:15am to 5pm at Marriott Courtyard - Must register in advance or at the door to attend
5. Saturday Pizza & Soft-drink Lunch at Marriott Courtyard for Registered Conference Attendees
6. Saturday Afternoon Snack for Registered Conference Attendees
7. Buffet Banquet Saturday Evening at Marriott Courtyard - Not Included in Registration - Purchase Separately - See below
8. ONE Copy of Proceedings on CD included with registration
9. Door Prize Eligibility - YOU MUST BE A REGISTERED CONFERENCE ATTENDEE AND PURCHASE A BANQUET BUFFET TICKET TO BE ELIGIBLE FOR DOOR PRIZE DRAWING
10. Sunday October 14 - Limited Tailgating at Marriott Courtyard for Registered Conference Attendees only 8-11 AM

For more information:

http://www.packratvhf.com/2012_Conference/vhf%20conf.html

President's Report

Well, the June VHF QSO Party is over and all I can say is WHEEeeewwwwww..!! Take a deep breath and try to recover. 6 meter was absolutely awesome! Lot's of sporadic E but on top of that, a long F opening into Europe really raised the grid count. If you missed this contest, you really missed a tremendous 6-meter party of the best kind. Add to that, we had great weather here in the northeast. We had very little rain where I operated on Mt Greylock, and to top it all off, the black flies were almost completely absent, very, very unusual for June.

The higher bands had less activity than usual (with everyone on 6 meters much of the time), but we noticed a few brief enhancements of propagation especially later in the contest on Sunday as there was very little wind even at 3500 feet, and so the atmosphere had a chance to set up in layers with some nice signals at medium to long distances, but no real rip-roaring opening. I did notice some nice signals on 2, 3 and 5 GHz out to the west on Sunday evening at about 250 miles, when only a few hours earlier, we had a hard time working the same station at a substantially better location only 230 miles away. I hope everyone got on the bands this past June and really enjoyed the operating.

This next meeting is our NEWS picnic meeting. Come one come all and bring your 10 GHz (and other) systems to test them against your friends' rigs. Good friends, good food and good listening.

73,
Dick, WA2AAU

Secretary's Report

NEWS Meeting 12 May 2012, Storrs Library, Longmeadow, MA

Preceded by a Board of Directors meeting at 1227

President WA2AAU called meeting to order at 1324

TREASURERS REPORT by WA1MBA

- 109 paid members + 14 permanent members
- Balance \$3675
- Report Approved unanimously

ANNOUNCEMENTS

- Dayton Hamvention
- June VHF Contest
- Field Day

- NEWS Picnic 7/14

- Joint Conference in October - papers needed and door prizes

- 6 meter sprint

- WA1ZMS beacon on 144.285 MHz has moved to new location

OLD BUSINESS

- Opened bank account for Conference at Webster Bank

NEW BUSINESS

- Proposed 2m beacon in Azores

- Proposed beacon in Virginia on 432.330

MOTION by K1MAP to donate \$100 for Azores beacon.

MOTION by K1MAP to donate \$100 to WA1ZMS to support beacons in VA. APPROVED UNANIMOUSLY

- K0VXM is offering a 10 GHz beacon for North Carolina

- 902 band plan in progress

- SEVHFS conference report by K1MAP

* ARRL president Kay Craigie, N3KN, attended

* Joe Taylor, K1JT, was the speaker

- 2013 Eastern VHF/UHF Conference - need date - spring preferred

MOTION - Committee to set date and make reservations. APPROVED UNANIMOUSLY

- Paula Blanchard, widow of Byron Blanchard, N1EKV, has asked NEWS to dispose of his ham gear, with the proceeds to go to NEWS as needed and to the ARRL Scholarship Fund.

W1FKF, W1GHZ, W1AIM, and N1JFU sold most of the gear at NEARFEST, and are working on the rest.

MOTION by KJ1K that 10% of proceeds from N1EKV estate be used for NEWS club projects and the remainder go to the ARRL Scholarship Fund - APPROVED UNANIMOUSLY

PROGRAM

N1JEZ - showed a Programmable Rubidium Frequency reference from ebay. FE-5680A. Programmable 1-20 MHz with available software.

KJ1K - presentation on Building the W1GHZ transverters.

N1DPM - showed a 6 meter conversion of the Harris pallet amplifiers good for ~700 watts.

Meeting Adjourned 1520

73,
Paul – W1GHZ

Treasurer's Report

The Treasury remains in healthy condition. Our July picnic annual meeting marks the end of the 2011/2012 club year and the beginning of the 2012/2013 year. That means that if your dues are paid up only through July of 2012 its time to renew (many folks pay years in advance). If you can't make it to the meeting and don't know when your membership expires, just send me an email: tomw at wa1mba dot org and I will let you know what the database shows.

At the picnic meeting, (as usual) I will bring a printout of the database so that we all can check for accuracy and pay dues. Checks are easy - made out to N.E.W.S. Group, but I can deal with cash too. Dues are \$15 per year. Its OK to pay ahead, and we even have a lifetime membership if you are interested. If you are mailing a check, use my address which is the return address on this NEWS Letter.

If you are providing food, charcoal, etc bring your receipts so that I can reimburse you.

This year I intend to bring a DC band radio (10 and 24 GHz) to see if/how well it works during the testing. I was very lucky last year to have Don W1FKF put it all together. I still have a bit of tweaking to do, but with fingers crossed will give it a try and be that much more ready for the August/September 10 G & Up contest.

73,
Tom - WA1MBA



Burt Hart, N2YYU SK

Our good friend and long time NEWS Group member, Burt Hart, passed on Saturday, April 28, 2012. Burt was especially active on 10GHz. Burt was the primary builder of the present 10 GHz beacon that he and Jud, K2CBA had installed on Mt. Greylock, Mass. Burt had a

10GHz transceiver in his truck. It was unique, with a rotatable antenna enclosed within a radome attached to the roof of the pickup.

He was a longtime resident of Red Hook, New York and was born on September 12, 1929, in Proctor, VT. Burt served 5 years in the United States Navy. He was a graduate of the University of Connecticut in Storrs, CT, and worked as an electrical engineer at Hamilton Standard and then retired after many years with IBM, where he earned several US Patents for his innovations in electronics.

He enjoyed scuba diving, HAM radio, gun clubs, welding, and building cars and trucks. Burt also volunteered at Northern Dutchess Hospital and worked for the Town of Red Hook plowing roads.

He is preceded in death by his beloved sister, Mildred. He is survived by two daughters, Diane Hart of San Diego, CA, Nancy Albright and son in law Philip Albright of Laguna Niguel, CA and their two daughters, Katherine and Rachel. Burt is also survived by the mother of his children, Irene Hart and sister in law, Ethel Been.

Memorial donations may be made in Burt's memory to the Northern Dutchess Hospital Foundation, PO Box 5002, Rhinebeck, NY 12572

Thanks to his and our friend and fellow NEWS member, Bobby Petersen, KB2RWW, for providing most of the information for this article.

- Mark K1MAP



**Dr. Gene Zimmerman,
W3ZZ, SK**

Gene Zimmerman, W3ZZ, of Gaithersburg, Maryland, passed away on Sunday, June 3. He was 71. Gene wrote the popular QST column "The World Above 50 MHz" from 2002-2011. He also served on the ARRL Contest Advisory Committee, edited the VHF contesting column for CQ Contest magazine during its five-year lifespan and was director of the CQ VHF Contest from 2000-2002. An ARRL Life Member, he earned VUCC on six bands: 50, 144, 222, 432, 903

and 1296 MHz, as well as DXCC, Worked All States and Worked All Continents on 6 meters. Gene was a member of the Delmarva VHF and Microwave Society, K8GP, the Grid Pirates Contest Group, a Past President of the Potomac Valley Radio Club and an honorary member of the Connecticut Wireless Association.

Gene Zimmerman earned a PhD in Microbiology from the University of Maryland in 1968, and then spent many years at the National Institutes of Health (NIH). The ARRL Letter has an extensive article on Gene's professional career.

But, Gene was known to many of us as a friend and a supporter of weak signal operation across the world. When writing his QST column, he was interested in every detail of what anyone was doing no matter if the person was inexperienced or experienced, young or old on 50MHz or 47 GHz and up. Gene lived near Washington DC but attended many, many VHF/UHF/Microwave conferences all over the country. Just a few years ago I remember seeing him at Enfield, CT, then a week later in Charlotte, NC. He could talk about any subject in our weak signal world. And, he was a good listener too. He was active right up until his death. He was a talent and a good friend to all of us. We will really miss him.

Here are two of the many comments:

From K1WHS;

I have had many telephone conversations with Gene over the years. I would pick up the phone thinking it was a customer only to have it turn out to be Gene Zimmerman with a query for his QST VHF column. There were never any short phone calls. They typically ran about an hour and a half with almost all of the talking done by Gene. I always marveled at how listenable his stories were. So much information, so many anecdotes. Gene was always a contester. I loved to hear his stories about lugging KW modulators up to large hilltops in the early 1960s for VHF contests. I remember hearing and working one of those early efforts, that of W1GB (W1 Good Boy) in Connecticut. Gene was a mover in that group. He achieved great status on HF as a contester as well. Gene was very active in all facets of ham radio. I always got a kick out of his VHF columns. There was much to read between the printed lines. At times the printed lines were a hoot as well.

My favorite was his column with descriptions of each VHF conference in the USA. For each one, he had a list of where the good restaurants were! That is typical Gene. Gene was a student of propagation, and always tilted towards propagation in his columns. His phone calls always included some propagation tidbits as well.

He always swore that Ray, W1REZ, had worked Portugal on 144 MHz in the early 50's from his place in Fairfield CT. That subject was the topic of one of our hour and a half phone conversations. He was very interested in tropo communications across the Atlantic and we discussed that subject at length many times. I will miss Gene's voice terribly. We have lost a great ham and a real personality. Gene used to visit Joel Knobloch at his shop in Gaithersburg, MD. Joel always used to tell me about Gene's visits. Poor Joel was so close to Gene's QTH, that he did not get phone calls like I did. Gene would just show up and hold court for hours, telling stories and destroying Joel's bottom line for the day. Joel loved it, and affectionately nicknamed Gene "Doctor Doom". Gosh, I am going to miss him. VHF and ham radio just became a bit poorer with Gene's passing.

- Dave, K1WHS

From N3IQ;

Things I learned from/with Gene:

- 1) As others have noted--he knew Everyone by callsign and name. He had a world-class memory for names, and by example he reminded us how powerful it is to call people by name---and for most people he had a story or an interesting contact or a historical reference, too!
- 2) Gene was a both an overt and covert promoter of ham radio. There are a surprising number of folks here that have told me that Gene was the one who encouraged them or got them connected with a mentor or talked them through an early problem. I wouldn't have known if they hadn't told me, usually later in their ham radio life!
- 3) Gene believed and practiced the art of setting expectations so that success was imminent. We sometimes called him Dr. Doom---but he wasn't really preaching gloom, or setting the bar low to foster mediocrity---he was making sure that folks had fun, and improved, no matter what the outcome was!
- 4) Gene knew where all the good eateries were. We shared good food and better company often (but not often enough), and those meals were usually very memorable. My favorite was in West Virginia on Rt. 33 about 10 miles out of Franklin on the old path to Spruce Knob - a BBQ place with huge portions. Yum.
- 5) Gene was amazing at his work. Not just the technical aspects of virology and pathology---where he was a recognized expert in his field---

but also in the process of conducting scientific studies, grant writing and reviewing, and getting funding for research. I am honored to have learned some tricks from him that I still use today.

- 6) Gene was an awesome contester. His resonant voice could hold a frequency as well as anyone I have ever known and his "Zed Zed" was one of the first and most frequent calls I heard on the air when I moved to this area. About the only voice my non-contesting wife recognized over the air was Gene's---she often wondered why he was chatting with folks while others were rushing to complete contacts and move on ---now we know that the relationships he fostered over the air and in person were worth an awful lot of contest points over the years!
- 7) He was no slouch on CW, either. I have had the opportunity to sit next to him for both HF and VHF contests and it is a fun learning experience. He understood the bands and propagation, recognized call signs quickly, and was a quick and accurate logger. He also was excellent at "search and pounce" and listening for the weak ones!
- 8) He was great as a contest "judge". One story: after watching 8P5A during CQWWCW a couple of years ago, he not only confirmed what a superb operator Tom Georgens is, but he shared with me an observation that shaped my contesting positively---seems Tom sends over 40 wpm most of the time, and that helps him control the huge pileups. I used to send much slower to make sure folks get the info and to get a rhythm. Speed works better. Thanks Gene!
- 9) Gene really enjoyed discussing everything. While our political and religious beliefs differed widely, he always treated my opinion and me with respect, and he listened. He didn't try to change me (and he was pretty stubborn, too). That mutual respect was appreciated.
- 10) He was passionate about this hobby. He was there at every event, every contest, every gathering, and when he wasn't, he was on the air, making contacts. He really believed in "use it or lose it", and he taught that by example. I miss him already. RIP "Zed Zed"

- Brian, N3IQ

Some of the information in this article was also supplied from an article in the ARRL Letter
- Mark K1MAP

Microwave Update 2012

The Microwave Update 2012 program committee is calling for papers and presentations on the technical and operational aspects of microwave amateur radio communications.

Papers will be published in the conference proceedings (print and CD). Many will also be selected for presentation at the conference. The conference will take place October 18-21, 2012, in Santa Clara, California.

The deadline for paper submissions is **August 25, 2012**. The *Word* file format is preferred. If you are doing a presentation, please try to also provide a paper with more than just outline slides from the presentation. We would like to publish articles in the proceedings that provide full content for people who are not able to attend the conference presentations. Detailed formatting information for authors (margins, photos, other files) is provided here:

http://www.microwaveupdate.org/docs/MUD_guidelines.pdf (PDF version)

http://www.microwaveupdate.org/docs/MUD_guidelines.doc (MS Word version)

The presentation version of selected papers is due **September 22, 2012**; *PowerPoint* file format is preferred. Additional guidelines for presentations are in the same Guidelines document, linked above.

Please e-mail your papers, as well as questions or comments regarding the technical program, to mud2012papers@gmail.com.

Solicited topic areas include:

- ⌚ Centimeter, millimeter, submillimeter and light wavelengths
- ⌚ Antenna design, simulation, construction, measurement, application
- ⌚ Microwave building blocks (LNAs, PAs, LO chains, Mixers, Synthesizers, Filters, etc)
- ⌚ Transverters (single and multiband)
- ⌚ Fixed station, Rover and Beacon design, packaging and operation
- ⌚ Operating techniques, software and other aids
- ⌚ Weak signal propagation modes and enhancements
- ⌚ New or unusual emission modes (ATV, digital modulation, wide area packet networks, etc)

- ⌚ Practical effects and limits of phase noise, antennas, path characteristics on various emission modes
- ⌚ Microwave components (affordable and available modern commercial components; homebrewed; surplus)
- ⌚ Repeaters (microwave bands and/or unusual modes like ATV, packet WAN)
- ⌚ Construction techniques (SMT, wirebond, microstrip, waveguide, substrates, homebrew)
- ⌚ Measurement equipment and techniques (tuning amplifiers or filters, optimizing noise figure, measuring phase noise, antenna patterns and gain; professional results on homebrew/shoestring budgets)
- ⌚ CAD (preferably free or low cost) for circuit, antenna, path and system simulation and design
- ⌚ Conversion of surplus microwave equipment
- ⌚ Or – suggest your own topics

Submissions may range from short notes to full length technical papers, original research to hints and tips, new designs to surplus conversions, professionally engineered to hacked on a shoestring budget.

Survey papers that summarize current know-how and tutorials that help and encourage newcomers are also welcome. Some topics may be organized and presented as workshops (for example, construction and measurement techniques).

Looking forward to seeing you and your presentation at MUD 2012,

Mike Lavelle, K6ML - mud2012papers@gmail.com

MUD 2012 Technical Program Chair

Update – A Personal Beacon for 10 GHz

Paul Wade W1GHZ ©2012 - w1ghz@arrl.net

The prototype of the 10 GHz personal beacon worked surprisingly well. I had forgotten some of the grounding plated-thru holes in the PC board, so I had to drill holes and add wires for grounding. The next batch of boards has the plated -thru holes for proper grounding. I also added a test point after the first tripler to aid in tuneup. Some of these boards have been successfully built by other hams, while others had some questions.

We also recently moved to a new QTH in Vermont, and

it has taken over a year before I was settled enough to get back to this project. I recently built up one of the newer boards and took notes so I can answer the questions and provide some hints. I also found a better way to put the probes into pipe-cap filters – I've had a couple fall into the pipe caps during assembly, and it is really hard to get them out again.

The completed unit is shown in Figure 1. The middle connector is the test point for the first tripler – it is connected by soldering C4 to the side transmission line as Ctest for tuning the first pipe cap, then moving the capacitor to its normal position before finishing tuneup. Tuning was smooth, and I measured almost 10 dBm at 3456 MHz at the test point. Screw depth is nearly the full height of the pipe cap.



Figure 1 - 10 GHz Personal Beacon

After moving C4 to the normal position, I decided to be brave and tune both of the 10 GHz pipe-cap filters at once. If both screws are set to the same depth, they should be on the same frequency, so they should be adjusted together. Once there is a glimmer of output, the screws can be tuned for maximum output. Screw depth in the 1/2 inch pipe caps should be roughly 3/16 inches. Since the input to the second tripler is at 3456 MHz, harmonics are widely separated in frequency, and there should be only one response in this range – a spectrum analyzer is not necessary for tuneup. Output at 10.368 GHz is about 11 dBm.

Since the harmonics are widely separated, the filters don't have to be really sharp. The probes can be a little longer, so the tuning isn't as sharp and the filters are less lossy. Probe lengths inside the pipe caps that I used are about 0.400 inches (10 mm) for the 3/4 inch pipe cap and 0.175 inches (4.5 mm) for the 1/2 inch pipe caps. Don't forget to allow for the board thickness, 0.062 inches (1.5 mm). With these probe lengths, the 3 dB bandwidth of the beacon is about 50 MHz.

I found that using disc capacitor leads for the probes makes it easier to control the depth, as shown in Figure 2. The leads fit the holes well, and the capacitor provides enough tension to keep them from slipping while soldering. Just measure the height to the bottom of the disc with the leads resting on the board, then insert the leads the desired distance plus the board

thickness, 0.062 inches (1.5 mm). C4 is in the test position in this photo, ready for tuneup as soon as the capacitor leads are soldered and cut off. And the disc capacitor is still usable – a VHF'er would never use more than ¼ inch lead length.

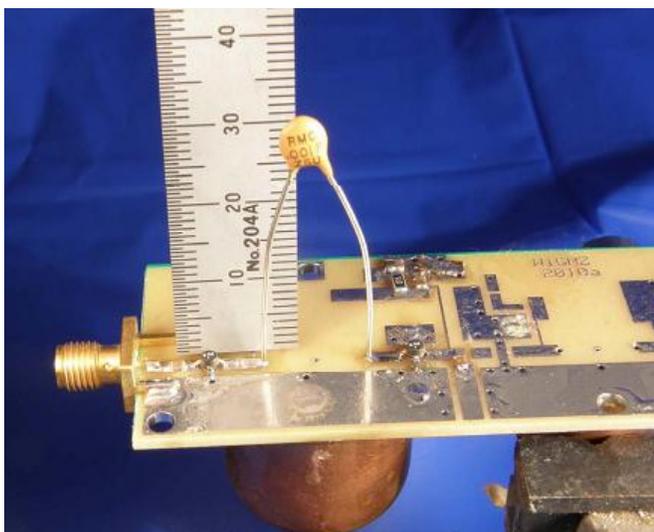


Figure 2 - Inserting probes into pipe-cap filters

A few notes on the board assembly. I left space for two bias resistors on each stage, to allow fine-tuning the bias currents. On the prototype, this seemed to help the multipliers. However, this unit seemed to work fine with 8 volts and 91 ohms for all stages, so I didn't fiddle. Instead, I grounded the extra pads on the first two stages with some solder-wick braid and just added jumper wires to the last three stages. Figure 3 shows the locations for these changes. The grounding braid on the first two stages can be seen in Figure 4, and the jumper wires are barely visible in Figure 1.

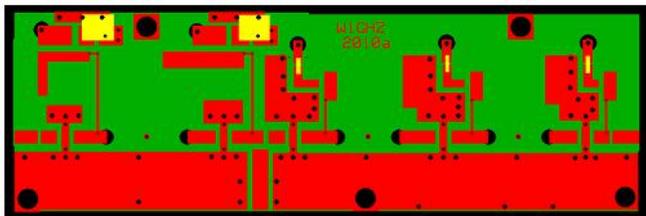


Figure 3 - Shorting locations in yellow

I also experimented with keying. Removing the voltage from only the final stage reduced output by about 47 dB, while removing voltage only the next to last stage reduced output by 32 dB. Removing voltage from the last two stages reduced the output into the noise. Keying the last two stages produced no spurious outputs.

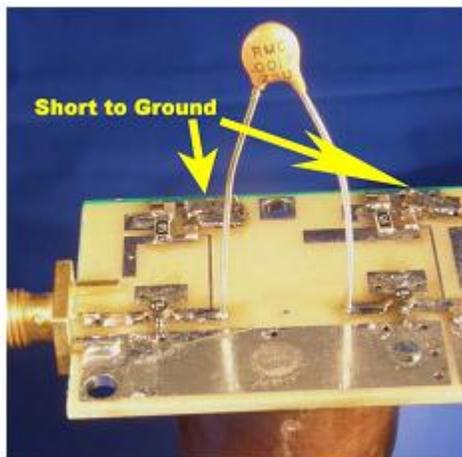


Figure 4 - Grounding braid for first two stages

The output spectrum is pretty clean – the only noticeable output is at 3456 MHz, about 35 db down. A short length of X-band waveguide will eliminate it.

In summary, reproducing the prototype result was straightforward and tuneup was smooth.

Another Power Amplifier for Cheap and Simple Microwave Transverters

Paul Wade W1GHZ ©2012 - w1ghz@arrl.net

I recently described a Modest Power Amplifier for my Cheap and Simple Transverters for the Rover. The simple untuned amplifier, using a Minicircuits GVA-84 MMIC, provides upwards of 100 milliwatts on any of the transverter bands.

Since then, Analog Devices announced a new MMIC, the ADL5324, capable of perhaps ½ watt. They come in the same package style as the GVA-84, so the same PCB might work. I found them available at Digi-Key and ordered a few to play with.

The transverters typically produce only a few milliwatts, enough for many rover contacts. Higher power amplifiers are available, but not always cheap, and often requiring significant DC power. If we could provide a bit more power without significant difficulty, expense, or DC power expenditure, it might enable more DX for the rover. Increasing the power to 100 mW is a significant step up, but getting up to ½ watt is moving into the serious rover category, if not too much battery power is required.

The ADL5324 does require some tuning, but it looks pretty simple, just chip capacitors placed at different locations along the input and output transmission lines for different frequency bands. Like the GVA-84, bias is

5 volts through a chip inductor – easily provided by a 7805 three-terminal regulator.

I looked at the tuning suggestions on the data sheet, and decided that tuning for 1296 MHz might best fit on the PC board I had made for the GVA-84, since I had a few boards left. The data sheet tuning suggestions skip from 960 MHz to 1880 MHz, but I guesstimated the values for 1296. Also, the estimated capacitor values were close enough to what I had on hand, so instant gratification was possible. I also ignored the data sheet recommendation for microwave capacitors and used ordinary cheap chip caps. After about an hour with X-Acto knife and soldering iron, the amplifier was ready to go, and worked immediately. Figure 1 is a photo of the amplifier, and Figure 2 is the schematic diagram.

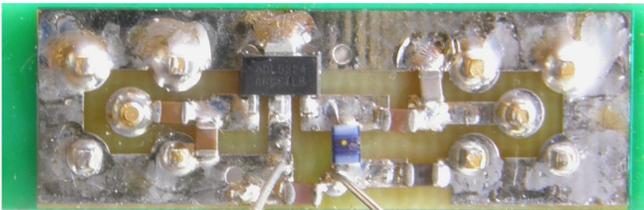


Figure 1 - ADL5324 1296 MHz Amplifier

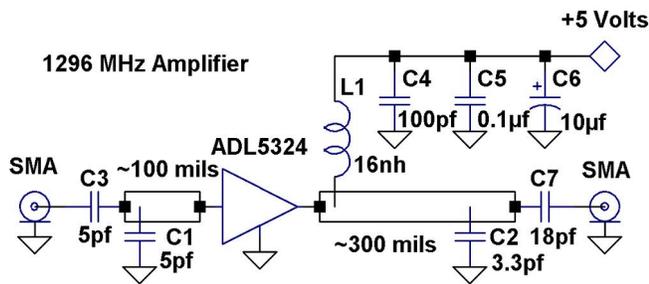


Figure 2 – ADL5324 1296 MHz Amplifier Schematic

I first tried the amplifier without the 3.3 pf capacitor at the output – with 10 milliwatts of drive at 1296 MHz, the

output was 165 mW, about 12 dB gain. Then I added the capacitor, and the output jumped to 325 mW, enough power to be interesting, with about 15 dB gain.

My sweeper only puts out 10 mW, +10 dBm, so I added the GVA-84 amplifier as a driver to push the power up. With -6 dBm into the GVA-84, the output from the ADL5324 is 520 mW. Increasing the drive to -3 dBm yields about 780 mW, about a dB less gain, so this is somewhere near the 1-dB gain compression point. Pushing the drive up to 0 dBm, 1 mW, produces 900 mW, pretty much saturated. At this power, it probably isn't very linear, but great for CW.

Another feature for rover use is that the device operates like a Class-AB amplifier – idling current is about 100 mA, increasing to 350 mA or so at full power. This reduces the battery drain and heat-sinking requirements. I also gave it a quick test at 902 MHz. Gain is down about 3 dB, and the output saturates at about 450 mW. So this amp is definitely tuned for 1296. Input return loss for the ADL5324 stage is at least 13 dB at 1296 and about 5 dB at 902 MHz.

The data sheet shows good power up to 4 GHz, so I will be making some amps for the higher bands. The PCB will probably require some modification to allow for more tuning freedom and better heat sinking. When I get it worked out, the boards will be available.

This should be a good homebrew project – simple and inexpensive, but with a chance to do some tuning and fiddling without much danger of disaster. It might even inspire you to try building a high-power amplifier with more expensive and fragile devices.

Finally, remember that these amplifiers are broadband, and the filtering in the simple transverters is barely adequate for a QRP signal. Please add a real metal filter between the transverter and a power amplifier.



<http://www.flex-radio.com/>

Directive Systems

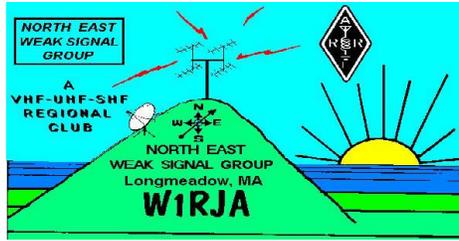
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Operational Bands (circle) 50 MHz 144 MHz 222 MHz 432 MHz 903 MHz

1.2 GHz 2.3 GHz 3.4 GHz 5.6 GHz 10 GHz 24 GHz 47 GHz

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The North East Weak Signal [N.E.W.S.]Group is being established to form a camaraderie among fellow VHF-UHF-SHF enthusiasts, and support a convenient means to exchange technical information. We currently have 6 meetings per year, held at a centrally located facility, and provide a "NEWSLETTER" that is distributed 2 weeks prior to each meeting. Any contributions to this publication are appreciated and can be sent to: Tom Filecco, W1WSO via email – w1wso@comcast.net. Dues are \$15/year. Remember, this group is formed by VHF'ers for VHF'ers.

Mail to:

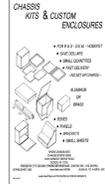
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Directions to Picnic

K of C

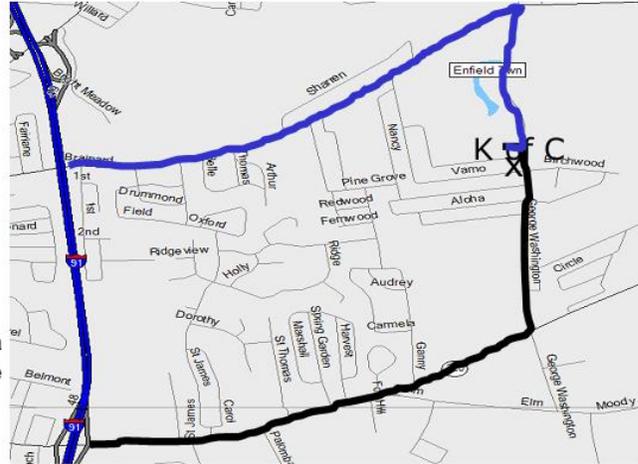
**371 Washington Rd
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RT-91 exit 48 on to Route 220 East (Elm St). Bear left at the fork onto Shaker Rd. At the 9th traffic light from exit 48, turn left on to George Washington Rd., K of C is 1 mile on the left.

Lost going that way? Try this:

RT-91 exit 49, go south on Enfield St Rt.5. Drive 1/2 mile, take a left on Brainard Rd. Drive 2 miles, take a right on to George Washington Rd. K of C will be on the right.

GPS: 42.015805 -72.560183



North East Weak Signal Group

c/o WA1MBA Tom Williams, PO Box 28, Shutesbury, MA 01072



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