# N.E.W.S. LETTER

**The Publication of the North East Weak Signal Group**

October 2010 Volume 19 Issue 5




***Next Meeting October 2, 2010***

***Storrs library Longmeadow MA.***

***Presentations by K1WHS and N1JEZ***



**Don't Forget**

**The North East Weak Signal Group**
**2 Meter VHF and Above Net**
**Every Thursday at 8:30 PM Local 144.250**
**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 You may download an application from our web page

http://www.newsvhf.com/

## The President's Corner

Our October 2, 2010 meeting is devoted to summaries of the September ARRL VHF QSO Party and the ARRL 10 GHz Cumulative Contest. There will be informal presentations by myself and N1JEZ among others . All others are invited to give a short wrap-up of their activities during these contest weekends. While conditions were poor for the VHF Contest, things improved for some during the 10 GHz weekend. While I was liaisoning Saturday morning on 144.260, I was called on SSB by K5YPV in MISSISSIPPI! That does not happen very often. I wish it extended to 10 GHz, but it barely made it to 432 and 1296. I got as far as EM89 on 1296, but others south of me did much better.

I was deeply involved in a multi op effort and had a great group of operators that were hard to beat. N1DPM, WZ1V, K9PW, W5ZN, K1BX, K0DI, N2CEI, and WA1T were all there and operating. I had been working hard checking and repairing all the antenna systems so that when the weekend arrived, all were working at full performance. All that work was very important as the contest conditions were simply awful and any lack of performance could not be made up by good conditions.

I want to go over some of the things that we did to improve the station and make things efficient.

N1JEZ has some good information about his exploits in the ARRL 10 GHz cumulative Contest. He literally had a blast on Mount Washington when he found himself in the middle of a nice 10 GHz duct that extended out westward and allowed some very nice contacts. For those who think that 10 GHz is a line of sight band, come to the meeting and be re educated!

Also remember that annual dues are due at the July meeting, so, if you are not paid up, please make a point to re new your membership with our illustrious treasurer at the October 2, meeting.

73

Dave Olean K1WHS

## From our Secretary

Minutes of NEWS meeting 10 July 2010 (Picnic)
at Knights of Columbus, Enfield, CT
President K1WHS called meeting to order at 1355
Next meeting October 2 at the Storrs Library, Longmeadow, MA

**Treasurers Report**

- Picnic is membership renewal time
- 99 paid members - most need to renew
- FY end balance ~$3000 after picnic expenses

**OLD BUSINESS**

- Club position on lasers in contests - deadline has passed

**NEW BUSINESS**

ANNOUNCEMENTS
K3HT - NOBARC ham fest 8/22
inviting clubs to set up info table
K1MAP - European heard 70 MHz beacon,
looking for 2M - see ON4KST website
W1TDS - beacon in Azores
W1MKY :AC1J volunteered for MUD prizes

- Pack Rats 9/25
- Boxboro Convention VHF session 8/29
- CQ VHF contest next weekend

WZ1V - railroads moving to 220 MHz

**ELECTION**

W1ZC elected to Board of Directors, 2 year term
Meeting Adjourned 1433
Followed by MDS testing at 10 GHz (24 GHz rained out)

## From our Treasurer

Hope you all had a fun contest. I had my tower down for the first time in 10 years for antenna repair. I got it up just before the contest ended, but have other problems in the shack and didn't want to blow anything up. I made two low band qso's with K1WHS. Next contest, hopefully, I will be there with all bands running.

Our treasury is doing just fine, and we are regaining membership dues. At this point in the club year we are at about the normal place for dues payments - but there are quite a few who have not renewed. If you are not paid up, just send a check for $15 made out to "NEWS Group" to me at the return address on the last page/ back of the NEWS Letter. If you don't know your paid status, send me an email t tomw@wa1mba.org or send a letter or postcard to me (same postal address on the last page). I hope to see you at the next meeting. Because its my birthday, my family might have other plans for my time. (More likely they will let me go to the meeting and call it my birthday gift. )

73s,

Tom WA1MBA

## Microwave Update 2010
## October 21-24, 2010
## Sheraton Cerritos, California

http://www.microwaveupdate.org/index.php

**For Sale:** Hilltop ranch home w/ horse barn in Bristol CT on 5 Acres. 950' ASL ideal Contesting / DX site w/ 60' tower, multiple feeds, Line of sight to 3 states! Reduced! $239,900. Own a dream QTH on top of the world! Details, photos, contact info at http://www.wz1v.com/ranch.html Follow link to MLS listing. Serious inquiries only, thanks.

-73, Ron WZ1V

## HAMARAMA

**Sunday October 3, 2010**

**http://packratvhf.com/**

## 10 GHz MDS Results

| CALL | RIG | 10 GHz MDS | | | 10 GHz ERP | |
|---|---|---|---|---|---|---|
| | | lost | back up | | | |
| WW1Z | 1W, 20 dBi horn | -76 | -75 | dB | | dB |
| AF1T | 10W, 24" prime | -101 | -96 | dB | 0 (ref) | dB |
| W1GHZ | 7W, 24" offset, SDR receiver | -98 | -99 | dB | -2 | dB |
| W1FKF | 3W, 18" Sony offset | -101 | -96 | dB | -5 | dB |
| W1EX | 1W, 24" prime | -101 | -95 | dB | -9 | dB |
| K1IIG | 2W, 24" prime | -93 | -86 | dB | -13 | dB |
| W1JHR | ?, 18" offset | never heard it | | | | |
| | | | | | | |
| | | | | | | |
| | | 24 GHz MDS | | | 24 GHz ERP | |
| | | | | | | |
| | RAINED OUT | | | | | |
| | | | | | | |

. This is of my 903 to 3456 Rover antenna. It is 4 inexpensive antennas made using 3 Foot booms. The arrangement is attached via trailer hitch using an Penninger Radio Tipper, Jr. and 2 " O.D.X 1/8" thick aluminum mast sections connected by "snap tubes." It is similar to military mast systems and this one can go up to 30Ft by just adding sections when the mast is parallel to the ground. I rarely use 20 ft because of feed line loss. I attach the other antennas I want on other short mast sections which "snap" into place. The 903 & 1296 are scaled back WA5VJB designs which are made from brass welding rod and an oak boom and are painted silver. Attachment to the DEs is by UT .141. The loop yagi on 2304 is a copy of a Directive Systems looper and the 3456 is a model copied from Directive Systems with a shortened boom. The H-Frame is made from square stock from Home Depot. With the short booms aiming is substantially easier than with my long boom loopers for the same bands. The concept was coming up with a quickly deployed rover antenna system for 8 bands on a single mast with no large overhang off the vehicle. There is more incentive now to take to the road for minor microwave events rather than face the hassle of lashing my longer loopers to a mast and then having to break them down. I am using this H-Frame arrangement with a M2 11 on 432, a 7 element M2 for 222, a 4 element M2 for 144 and an M2 HO Loop on 50 MHz all mounted on the same mast in transit for a total height above ground of 128 Inches. On 5 & 10 GHz I am using a Directive Systems 60cm dish with the W5LUA dual band feed on a tripod. I was tempted to mount this dish inside the H-Frame but there is only so much you can do on a short mast. I did not keep track of what I spent to build the 4 mw antennas but it was pretty cheap. Best DX so far on the Quad 903 to 2304 was Montauk to Mount Equinox.

73,
George, W1JHR

**2010 North East Weak Signal Group VHF**

**CALENDAR:**

**Tentative 2010 dates:**

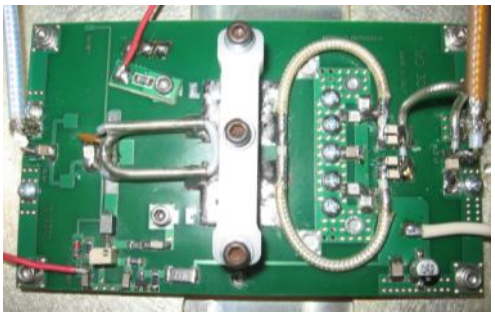
September 18-19, 6AM - 11:59:59PM - ARRL 10-GHz & up Cumulative Contest
September 20, 1900-2300 Local - 144 MHz Fall Sprint
September 25-26 - Mt. Airy VHF PackRats Conference and Hamarama
September 28, 1900-2300 Local - 222 MHz Fall Sprint
October 2, 1PM - 4PM - N.E.W.S. Group Meeting
October 6, 1900-2300 Local - 432 MHz Fall Sprint
October 15-16 - New England Amateur Radio Festival - Deerfield, NH
October 16?, 0600-1200 Local - Microwave Fall Sprint
October 21-24 - Microwave Update
October 23?, 2300-0300 UTC - 50 MHz Fall Sprint
November 13, 1PM - 4PM - N.E.W.S. Group Meeting
November 18, ????Z - Leonids meteor shower
December 14, ????Z - Geminids meteor shower

# A 500 Watt SSPA on 222 MHz

*Mike, N1JEZ*

This article will describe the integration of an I0JXX pallet amp in to a complete 500 watt 222 MHz amplifier.

Recently, I0JXX released pallets for 222 MHz based on the Freescale MRF6V2300NBR1. This is a 10-600 MHz 300 W 50 V Lateral N-Channel Single-Ended Broadband RF Power MOSFET (quite a mouthful!). The pallet uses two of these devices to achieve up to 500 watts with about 6 watts drive. http://www.i0jxx.com/index.php?cPath=18_34_35_80

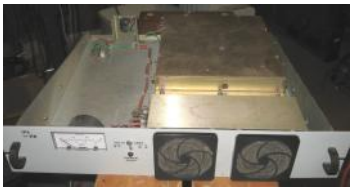


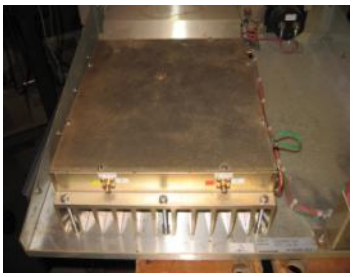
As I write this in early September, there still is no documentation for the pallet on the I0JXX web site but it is very similar to the 2M pallet, so that can be used as a guide. The data on the Freescale part is here: http://www.freescale.com/files/rf_if/doc/data_sheet/MRF6V2300N.pdf

As with any solid-state amp, cooling and protection are primary goals. I recently used the W6PQL (PQL) Multifunction Controller board on a 432 SSPA project so I decided to use it on this amplifier as well. This board is available from Jim as a kit for $35. http://www.w6pql.com/Upgraded_Amplifier_Controller.htm The board includes a 3-stage sequencer, thermal/fan control and VSWR protection, all of which are adjustable. It is not designed to be a "station sequencer", but rather a control board for the amplifier itself.


The pallet amp runs on 48 Vdc and needs –5 Vdc to inhibit the bias on the amp (standby). Since the PQL board is designed for either 24 or 12 Vdc, I needed to come up with a way to power it and my RF relays that use 12 Vdc. I really wanted to be able to use just one 48 volt power supply to power the amp. My solution was a DC to DC converter. Vicor makes some really nice units. I was able to acquire two 48 Vdc to 12 Vdc modules capable of 150 watts at 12 Vdc. They are very compact at only 2-⅜" x 1-½". http://www.vicr.com


Now that I had the basic power requirements solved, I started work on mounting/cooling the 222 pallet. When I tore apart several old analog TV transmitters on Burk Mountain some months ago, I salvaged a couple of low power rack mount driver units. One of the chassis' was 2 RU with a front panel meter and a nice heat sink with dual 24 Vdc fans. The fans fed into a plenum that drove air through the heat sink fins. It was designed for front to rear cooling. Perfect for rack mounting!





I removed the existing electronics from the salvaged chassis and mounted the 222 pallet. The PQL board comes with a temperature sensor that I mounted on the pallet very close to the devices. RF relays were mounted on the rear of the chassis. I used a Tohtsu CX-600NL for output and a Sage transfer relay for input - overkill, but what I had on the shelf. I used a salvaged CMC directional coupler with an RF detector on the reflected port for a VSWR sample. The fans were wired in series for 48 Vdc operation. PTT In/Out is via a pair of RCA jacks also on the rear panel.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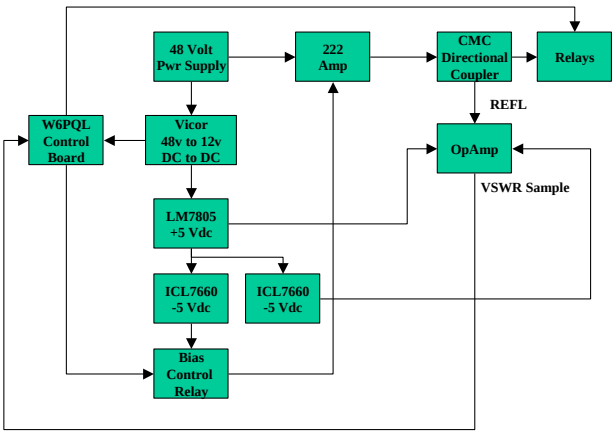



Block diagram of the amplifier

You will notice that there is an inverting opamp inline with the VSWR sample. The PQL board needs a negative voltage for a VSWR sample. My diode detector gave a positive voltage. I also found that the sample voltage was too low to provide a reliable trip point so I built up a quick and dirty (junk box) inverting opamp with a gain of about 6.

To set the VSWR trip point, I hooked my 222 rig to the output of the amp. I then hooked up a wattmeter and dummy load on the input side of the CMC directional coupler. I wanted to set the trip point at ~2:1 so I adjusted my rig for 50 watts, transmitted backwards into the directional coupler and set the VSWR circuit to trip.

The sequencer on the PQL board is wired for: Stage 1 - RF input/output relays, Stage 2 - Amp Bias and Stage 3 - PTT out. My Master Station Sequencer sends a PTT signal to the PQL board. The PQL board then closes the RF relays, turns on the pallet bias and then sends an "I'm OK" PTT out signal back to the Master Station Sequencer so that it can key the driver and send RF.

The thermal control works as follows. When the amp is keyed up, the fans are always on. On release of PTT, the fans will remain on until the temperature on the pallet falls about 5 degrees below the set point. The original PQL board was turning the fans off when the set point was reached, but this caused the fans to cycle on/off due to some residual heat remaining in the heat sink.

If the VSWR set point is exceeded, PTT out is released (RF drive terminated), amp bias is shut off and RF relays are released. I want to add two more stages of protection. The first involves adjustable current limiting to the amp pallet. That is in the works. The second is an overall temp sensor for when the heat sink reaches a critical temperature such as if the fans failed. When triggered, both of these circuits will act just like a VSWR trip.

While testing the amp for thermal management, I sent WSJT at 400 watts for 10 minutes into my dummy load. The amp never got hot enough for the fans to run continuously.

The PQL board drives several front panel mounted LED's for status and I have modified the meter on the front to check 48 and 12 Vdc using a toggle switch.

# A Standalone Monitor for your Thunderbolt

There are quite a few Thunderbolt GPSDO's floating around thanks to the units being sold out of China. These are a very reasonably priced GPSDO unit with decent performance!

There are several software packages available to monitor the performance of the units as well as change parameters. Lady Heather, Tboltmon.exe and DSPMon_V1-53.exe all come to mind. However, these all require a computer with a serial port.

If all you're looking to do is keep an eye on the status of your Thunderbolt, there is a solution available. It's called the iCruze Monitor by Monster. Originally designed as part of the iCruze system, it's an LCD that would display things like song titles from devices such as your iPod.

This modified unit that works with the Thunderbolt is available from fluke.1 on eBay. He is also one of the primary sources for the Thunderbolt and is very easy to deal with. The unit is based on work done by KO4BB to come up with a standalone monitor.

http://www.prc68.com/I/ThunderBolt.shtml#iCruze

The unit has a power connector for 9-12 Vdc and a DB-9 male that hooks to the Thunderbolt serial port.


Once connected, the top line displays either GPS or UTC time & Date depending on how the receiver is set.

The second line shows:
No Message if it's not connected to the serial port of the Thunderbolt, or alternating:
MODE: Normal
ACT: Phase Lock
RX: Overdet Clk
GPS: Doing Fixes
TEMP: 32.45
DAC V: 0.4874

This can be a very convenient way to keep track of your Thunderbolt without having to deal with another computer. Cost when I purchased mine was $28. Mike, N1JEZ

# A Microwave Day to Remember

*Mike, N1JEZ*

As we approached the 2nd weekend of the 10 GHz and up Cumulative I was watching the weather carefully. My plan was to go to Mt Washington, FN44ig for at least one of the two days. As we all know, weather on Mt Washington is a big factor. At over 6200 feet, it can be downright nasty up there!

On Friday night, I made my decision to head to the summit on Saturday. Larry, K1LPS was debating whether to tag along or not. In September, the Toll Road doesn't open until 8AM. I headed up at around 8:15AM. K1LPS was nowhere to be found at that point.

The temperature at the base was 37 degrees when I started out. I had packed all the "winter" gear – Gore-Tex pants, winter parka, heavy boots etc, in anticipation of a chilly day on top. As I climbed, the temperature rose. By the time I got on top, it was 46 degrees, sunny and no wind!

I set up my gear in the lower left South facing parking lot and worked the usual early morning suspects – AF1T, W1MKY, K2TXB, W1GHZ, KB1VC and KA1OJ who had 24 GHz as well. Signals to Dale, Mickey and Russ were the strongest I've ever seen in that direction, so I was hopeful for some propagation. I was not to be disappointed!

Soon after those contacts I heard a very loud signal on 2M calling me. It was a station in EM66. That contact was followed by one in EM54. Unfortunately, neither station had 10 GHz.

Suddenly I heard a loud call on 2M from Steve, KB8VAO. Steve and I go way back to the days of AO-10 and AO-40 satellites where we chased DX. I knew he had 10 GHz. He reported he was in FN00sn. We calculated a heading and I started sending dashes. He came back almost immediately that he was hearing me and said "go sideband"! We worked easily – 719 km

By this time, K1LPS had shown up. We reconnected with Steve to see if Larry could work him. I run approximately 4.5 watts. Larry runs 280 mW. Larry was successful on sideband!

Below are two links to some MP3's of the contacts. These were recorded by Steve. He was having some issues with his digital recorder, but you can hear both K1LPS and me work him

http://www.burlingtontelecom.net/~n1jez@burlingtontelecom.net/N1JEZ_KB8VAO.mp3

http://www.burlingtontelecom.net/~n1jez@burlingtontelecom.net/K1LPS_KB8VAO.mp3

Things picked up from there. Here's a shortlist of the longer contacts. The best DX was NA4N at 845 km. Both Larry and I worked Greg.

| | | | | | |
|---|---|---|---|---|---|
| 20100918 | 1426 | KB8VAO | FN44IG | FN00SN | 719 |
| 20100918 | 1534 | VE3FN | FN44IG | FN15IK | 492 |
| 20100918 | 1729 | WA3TTS | FN44IG | FN00RG | 745 |
| 20100918 | 1753 | W3SZ | FN44IG | FN20AG | 588 |
| 20100918 | 1757 | WA2FGK | FN44IG | FN21BF | 505 |
| 20100918 | 1831 | NA4N | FN44IG | FM08US | 845 |
| 20100918 | 2003 | K3CB | FN44IG | FM18VR | 740 |

The contact with K3CB was my second attempt. We worked pretty easily in CW after hearing nothing earlier in the day.

Here's a picture of what Larry and I saw pretty much all day from Mt Washington – that 'layer' on the horizon.

Here's the shot from FN00sn at KB8VAO's end of the contact. Yes there were trees in the way!

Probably the most memorable contact was Larry working WA3TTS. Mike was running 200 mW on Blue Knob, FN00rg – Larry had 280 mW

.So I ended up breaking my previous DX record of 595 km three times. I also added three new grids to the total from Mt Washington. It now stands at 31 worked. I won't forget this day soon.

# N.E.W.S. Group Membership Application

Name: _____ Call sign: _____ Grid: _____

Street: _____

City: _____ State: _____ Zip: _____

Phone (home) _____ -_____ -_____ Optional (work) _____ -_____ -_____

Email _____

ARRL member? Y N Electronic Newsletter Delivery? Y N

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

76 GHz Light Other (list)

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: Don Twombly, W 1FKF 23 Maura Dr. Woburn, MA 01801 Email: donw1fkf-news (at) yahoo (dot) com. Dues are $15/year. Remember, this group is formed by VHF'ers for VHF'ers.

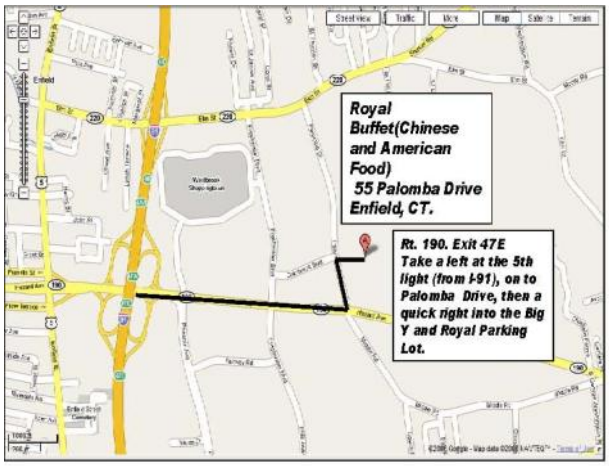
Mail to:

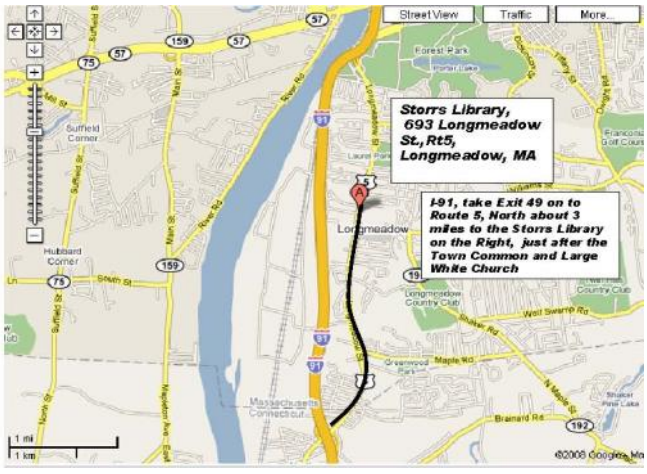
**North East Weak Signal Group**

**c/o WA1MBA Tom Williams PO Box 28**

**Shutesbury, MA 01072**

Email: tomw (at) wa1mba (dot) org **ARRL Affiliated Club**



***Next Meeting October 2, 2010***

***Storrs library Longmeadow MA***

***Presentations by K1WHS and N1JEZ***

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**Every Thursday at 8:30 PM Local 144.250**
**W1COT, WZ1V or K1PXE Net Control**

## North East Weak Signal Group

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

Check your membership
expiration date on your mailing label!