

N.E.W.S. LETTER

The Official Publication of the North East Weak Signal Group – <http://www.newsvhf.com/>

March 2019

Volume 28

Issue 2

NEWS Group Meeting Saturday March 23, 2019

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BOARD MEETING - 11:00 AM at Lulu's, 151 Hazard Ave. Enfield, CT
Phone: (860) 763-2377 I-91 Exit 47 Rt. 190E 1 Mile on Left
<http://luluspizzeria.com>

GENERAL MEETING - STORRS LIBRARY - from 1 PM to approximately 3:45 PM
693 Longmeadow St, Longmeadow, MA 01106
<http://longmeadowlibrary.org>

DON'T FORGET

The North East Weak Signal Group 2 Meter 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 \$10 per year
Apply to John Crawford, N2OY. E-mail: n2oy.vhf@gmail.com

A membership application form can be found at the end of this newsletter
or it can be downloaded from our web page: <http://www.newsvhf.com>

The NEWSLetter is the publication of the North East Weak Signal Group
Articles may be reprinted with proper credit given to the author and the NEWSLetter
Send articles by e-mail to George Collins, KC1V at news.kc1v@gmail.com

Secretary's Report – January Minutes

(W1GHZ unable to attend, minutes take by KC1V)

- NEWS Meeting: 12 January 2019, Storrs Library, Longmeadow, MA.
- President WA2AAU called meeting to order at 1325 EST.

TREASURER – N2OY

- Payment of \$300 to Library.
- Balance \$3038.85
- 20 Members have paid for 2019, with about 100 not renewed yet
- 2019 Dues are \$10.

OLD BUSINESS - None

NEW BUSINESS

- K1MAP - Conference Report: Registration will begin in a few days; help is needed at the registration table; there will be no "local" NEWS Flea market this year.
- K1MAP (Conference Treasurer) - Conference treasury balance is approximately \$12,000. Club should consider what to do with the surplus.
- W1FKF - Nearfest club table – cleanup help is needed on Saturday, email Don.

BUSINESS MEETING ADJOURNED 1338 EST

PRESENTATIONS

- Equipment test and measurement session.

VHF Super Conference April 25 – 28

Holiday Inn Washington-Dulles International Airport

(Same Location as the 2016 Super Conference)

Sponsored by SVHFS, NEWS Group and The Packrats

Hosted by the Grid Pirates Contest Group and Directive Systems and Engineering

Registration

The conference will be held April 25-28, 2019 at the Holiday Inn Washington-Dulles International Airport, 45425 Holiday Drive, Sterling, VA

Early Bird Discounts!

Registration is \$99 through March 31, \$110 after March 31 – *if available*

Includes: Lunch and All Day Beverages Friday and Saturday
Hospitality Room Thursday and Friday Evenings
Conference Proceeding CD

Banquet: is \$43, through March 31; \$50 after March 31 – *if available*

A Group Hotel Rate of \$99+tax is Available

This group rate is available only until March 25

See the VHF Super Conference Web Site [for Hotel details](#)

Or call Hotel Reservations: 877-875-9823, Ask for
"VHF Super Conference 2019" Special Rate

On-Line Registration Available Now

There is Something for Everyone!

*** Microwaves ***
*** CW & SSB Weak Signal DX ***
*** Digital ***
*** 6 Meters and Up ***
*** Vendor ***
*** Contesting ***
*** Great Amateur Radio Fellowship ***

Schedule of Events

Thursday: DC Bus Trip, Evening Hospitality
Friday: Presentations all day, National Zoo
Bus Trip, Evening Hospitality
Saturday: Presentations all day, Evening
Banquet
Sunday: Morning Tailgate in Parking Lot

Thursday and Friday Bus Trips

Thursday: \$39 through March 31, \$45 after March 31 (if available). Three-hour Guided Bus Tour of Washington, DC plus three hours on your own to visit the Smithsonian area museums and the Capitol. Bus leaves at 10 AM, returns about 6 PM.

Friday Bus Trip: \$29 through March 31, \$35 after March 31 (if available). Four hours on your own at the National Zoo. Bus leaves at 10 AM, returns about 4 PM.



The Super Conference *Wants You!*

Second Call for Papers and Presentations Super VHF Conference II

You are needed to make this Conference a success. Please tell us about something you have done. If you are shy, write a paper for the Proceedings.

The Second VHF Super Conference is being held April 26-28, 2019, in Sterling, VA, near Washington, DC. The conference is jointly sponsored by Mt. Airy VHF Radio Club (Packrats), North East Weak Signal Group (NEWS) and Southeastern VHF Society (SVHFS). It is being hosted by the Grid Pirates Contest Group and Directive Systems and Engineering.

For details see <http://vhfsuperconference.com/>

Presentations or papers are welcome on VHF, UHF, microwaves and higher. All aspects welcome; technical and non-technical - operating, contesting, homebrewing, roving, software, EME, surplus, antennas, test equipment, amplifiers, SDR, 47-GHz superregen, whatever. Your winter project might be a good candidate - take some pictures. N2CEI and W1GHZ will be coordinating the Proceedings book and CD.

Submissions and questions to: conferencepapers@downeastmicrowave.com

73, Paul and Steve

Analog Devices ADALM-Pluto Software Defined Radio

Mike, N1JEZ

Analog Devices has released a new teaching module. The ADALM-Pluto (Analog Devices Active Learning Module) is a software defined radio covering 325 MHz to 3.8 GHz. It was designed to be used as a teaching tool. This module is reasonably priced at around \$150 (shop around for deals - I got mine for \$125).



Features

- Portable self-contained RF learning module
- Cost-effective experimentation platform
- Based on Analog Devices AD9363 Highly Integrated RF Agile Transceiver and Xilinx® Zynq Z-7010 FPGA
- RF coverage from 325MHz to 3.8GHz
- Up to 20MHz of instantaneous bandwidth
- Flexible rate, 12-bit ADC and DAC
- One transmitter and one receiver, half or full duplex
- MATLAB® Simulink® support
- GNU Radio sink and source blocks
- Libiio, C, C++, C#, and Python APIs
- USB 2.0 Interface
- High-quality plastic enclosure
- **Power**
 - DC Input (USB): 4.5V to 5.5V

- **Conversion Performance and Clocks**
 - ADC and DAC Sample Rate: 65.2kSPS to 61.44MSPS
 - ADC and DAC Resolution: 12bits
 - Frequency Accuracy: ± 25 ppm
- **RF Performance**
 - Tuning Range: 325MHz to 3800MHz
 - Tx Power Output: 7dBm
 - Rx Noise Figure: <3.5dB
 - Rx and Tx Modulation Accuracy (EVM): -34dB (2%)
 - RF Shielding: None
- **Digital Specifications**
 - USB: 2.0 On-the-Go
 - Core: Single ARM Cortex[®]-A9 @ 667 MHz
 - FPGA Logic Cells: 28k
 - DSP Slices: 80
 - DDR3L: 4Gb (512MB)
 - QSPI Flash: 256Mb (32MB)
- **Physical Specifications**
 - Dimensions: 117mm×79mm×24mm or 4.62"×3.11"×0.95"
 - Weight: 114g
 - Temperature: 10°C to 40°C
- **USB device classes supported by the PlutoSDR Host Interface:**
 - Mass storage (for easy firmware updates)
 - Serial (for interacting with the Linux kernel/userspace on PlutoSDR)
 - Networking/RNDIS (for loading and controlling custom ARM[®] applications)
 - Libiio (bulk USB for SDR data transfer and control)
 - Device firmware upgrade (for backup firmware upgrades)

As you can see, there's a lot in this little package.

One of the toughest parts of these devices is finding suitable software to run them - especially for transmitting. While most all will work with programs like GNU radio, the learning curve is steep for the average ham with no DSP background.

Lucky for us, Simon Brown comes to the rescue. Simon is the author of SDRConsole v3. This powerful Windows program supports the Pluto (and many other SDR's) in both receive and transmit. His software is free:

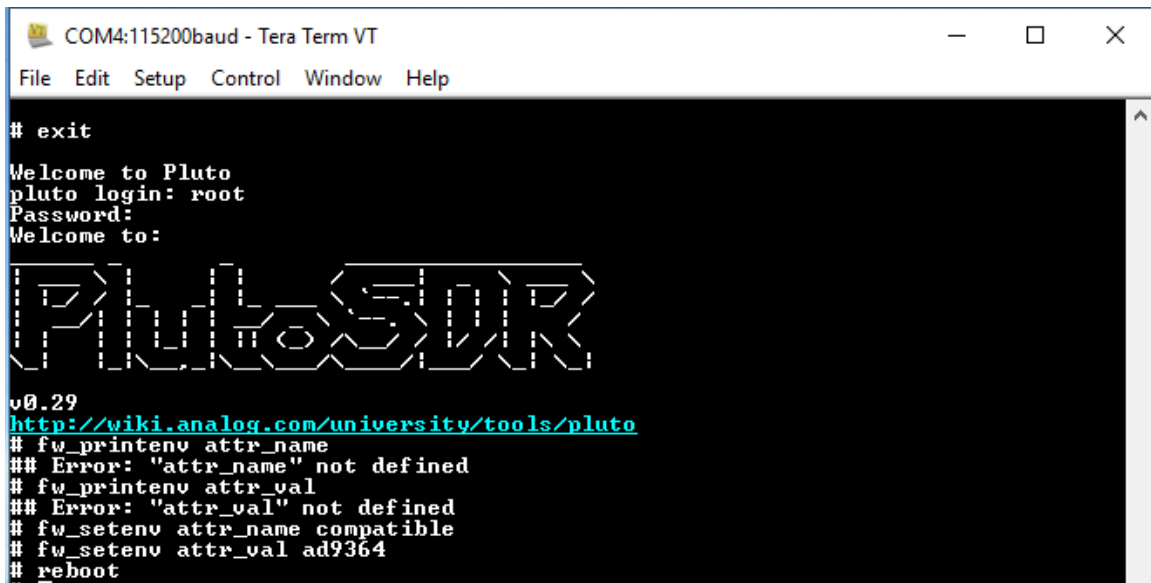
<https://www.sdr-radio.com/>

Once you receive your Pluto, you will need to install drivers for it. These can be downloaded here:

<https://wiki.analog.com/university/tools/pluto/drivers/windows>

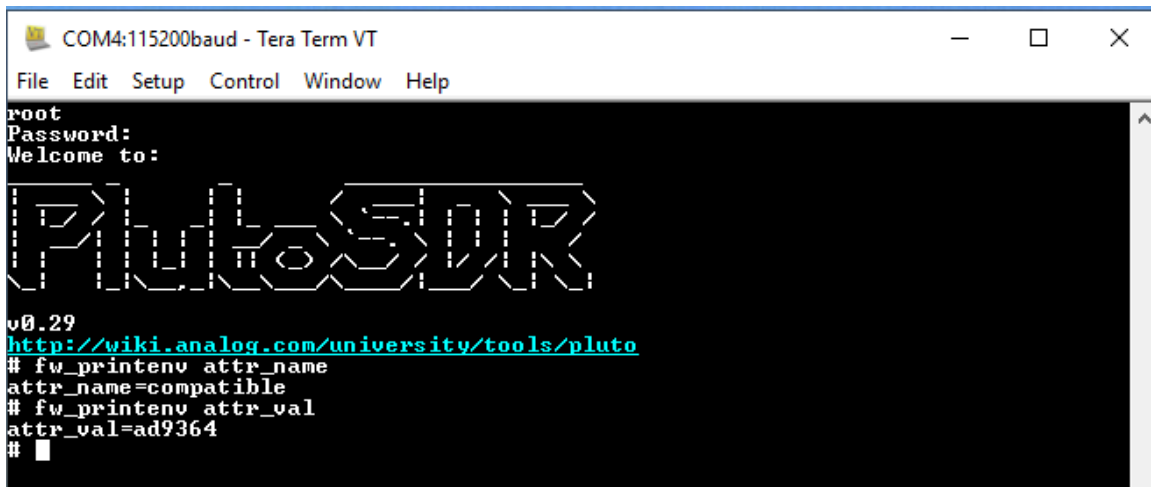
While the Pluto frequency coverage is good, there is a "hack" to make it even better. The Pluto uses the Analog Devices AD9363 RF transceiver. This covers 325 MHz to 3.8 GHz. We can trick the Pluto in to thinking it has an AD9364 chip inside. This extends the coverage from 70 MHz to 6 GHz. It turns out, the Pluto is shipped with an AD9364, but they call it an AD9363 because the part may not have met "spec".

To hack your Pluto, you will log in to the Console using a telnet client such as PuTTY or Tera Term. When you first installed the Windows drivers, it created a COM port. This is the port you will use to talk to the Pluto. Below you can see I've connected with Tera Term on COM4 at 115200 baud. Use root/analog for user/password. Then use the fw_printenv command to check your Pluto followed by the fw_setenv command to change the variables. See below.



```
COM4:115200baud - Tera Term VT
File Edit Setup Control Window Help
# exit
Welcome to Pluto
pluto login: root
Password:
Welcome to:
PlutoSDR
v0.29
http://wiki.analog.com/university/tools/pluto
# fw_printenv attr_name
## Error: "attr_name" not defined
# fw_printenv attr_val
## Error: "attr_val" not defined
# fw_setenv attr_name compatible
# fw_setenv attr_val ad9364
# reboot
```

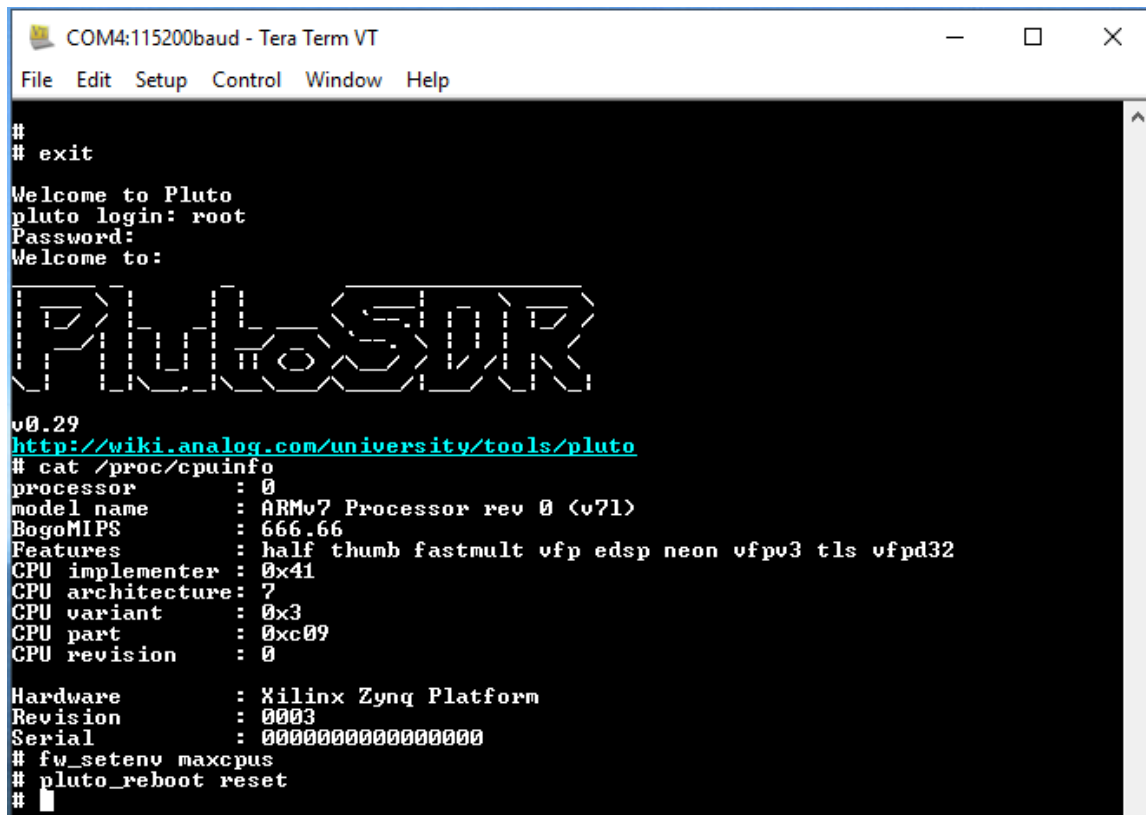
Once you've issued the commands and rebooted, it should look like this when you interrogate it with the fw_printenv commands.



```
COM4:115200baud - Tera Term VT
File Edit Setup Control Window Help
root
Password:
Welcome to:
PlutoSDR
v0.29
http://wiki.analog.com/university/tools/pluto
# fw_printenv attr_name
attr_name=compatible
# fw_printenv attr_val
attr_val=ad9364
#
```

You now have the extended tuning range.

There is also a hack to enable a second core in the CPU. To do this, log in to the Console again and use the `cat /proc/cpuinfo` command to check your Pluto. Then use `fw_setenv maxcpus` to enable the second core.



```
COM4:115200baud - Tera Term VT
File Edit Setup Control Window Help
#
# exit

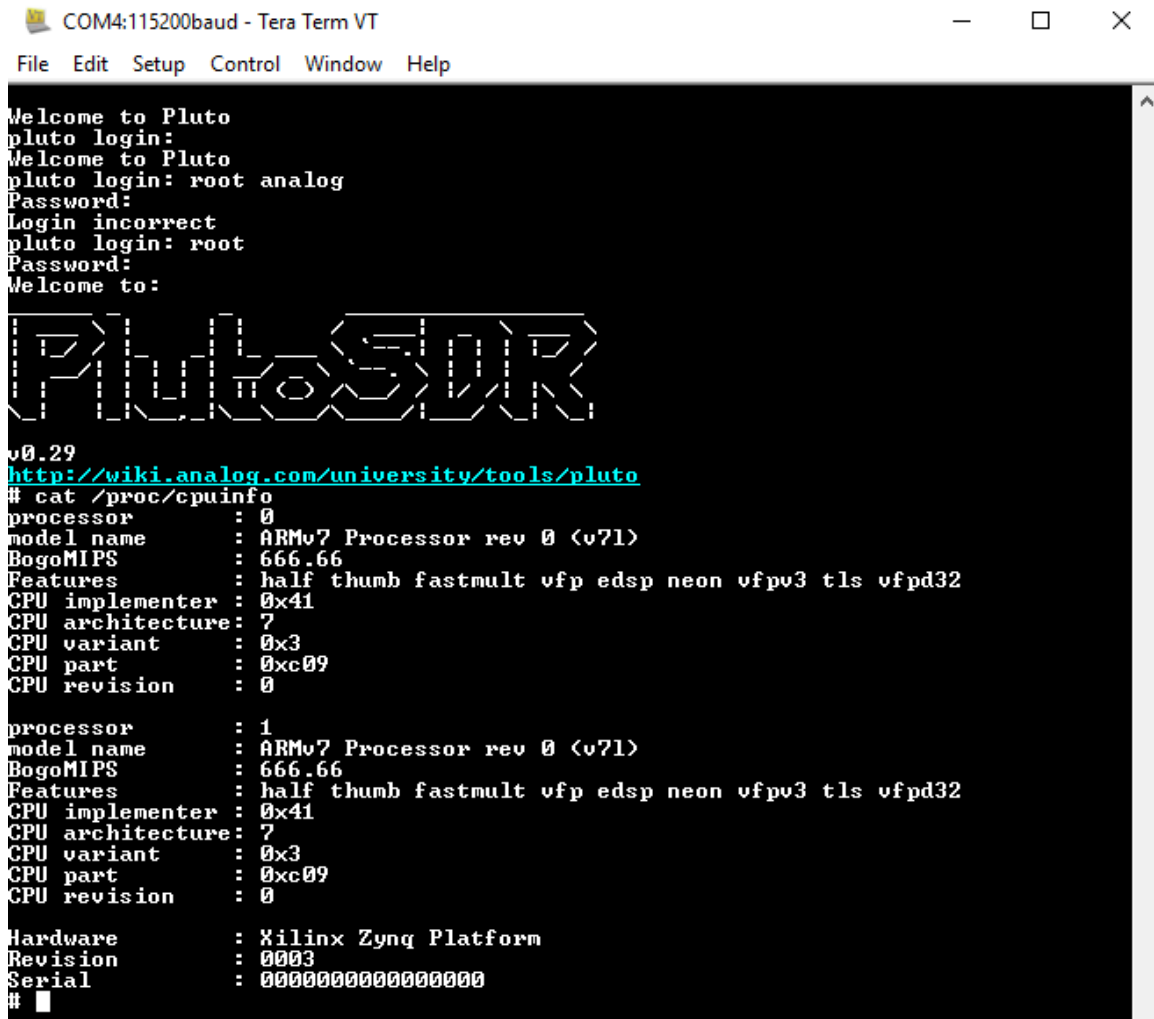
Welcome to Pluto
pluto login: root
Password:
Welcome to:

PlutoSQR

v0.29
http://wiki.analog.com/university/tools/pluto
# cat /proc/cpuinfo
processor       : 0
model name     : ARMv7 Processor rev 0 (v7l)
BogoMIPS      : 666.66
Features       : half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer : 0x41
CPU architecture: 7
CPU variant    : 0x3
CPU part       : 0xc09
CPU revision   : 0

Hardware      : Xilinx Zynq Platform
Revision      : 0003
Serial        : 0000000000000000
# fw_setenv maxcpus
# pluto_reboot reset
#
```

It will look like this for dual cores (processor 0 and 1 will be enabled).



```
COM4:115200baud - Tera Term VT
File Edit Setup Control Window Help

Welcome to Pluto
pluto login:
Welcome to Pluto
pluto login: root analog
Password:
Login incorrect
pluto login: root
Password:
Welcome to:

PlutoSDR

v0.29
http://wiki.analog.com/university/tools/pluto
# cat /proc/cpuinfo
processor       : 0
model name     : ARMv7 Processor rev 0 (v7l)
BogoMIPS      : 666.66
Features       : half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer : 0x41
CPU architecture: 7
CPU variant    : 0x3
CPU part       : 0xc09
CPU revision   : 0

processor       : 1
model name     : ARMv7 Processor rev 0 (v7l)
BogoMIPS      : 666.66
Features       : half thumb fastmult vfp edsp neon vfpv3 tls vfpd32
CPU implementer : 0x41
CPU architecture: 7
CPU variant    : 0x3
CPU part       : 0xc09
CPU revision   : 0

Hardware      : Xilinx Zynq Platform
Revision      : 0003
Serial        : 0000000000000000
#
```

There is one more thing you should do to your Pluto: Upgrade the Firmware. First download the latest firmware (0.30 at this time) from:

<https://github.com/analogdevicesinc/plutosdr-fw/releases/tag/v0.30>

Download the plutosdr-fw-v0.30.zip file and extract it. The Windows drivers you installed will have also created a Pluto USB Drive on your machine. From the firmware file you extracted, copy pluto.frm to the Pluto USB Drive that was created. Next, 'eject' the drive. It is very important to 'eject', not just remove the drive. Once you select 'eject', one of the blue LED's on the Pluto will start flashing fast. Let it finish and then it will reboot.

Next, open the Pluto USB drive again and select info.html, this will bring up a webpage in your browser. Select the Firmware tab and you should see this screen showing the firmware revision (build v0.30).

Firmware

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The *ADALM-PLUTO Firmware* refers to the U-Boot, HDL, Linux kernel, device drivers, and user space software, which runs on the PlutoSDR. This is bundled up and given a specific version number for the PlutoSDR. For help upgrading firmware, check out the [online documentation](#).

Status of the PlutoSDR firmware:

Pluto is using the same version as latest release!

Version Information:

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The various parts of the firmware all have their own unique versions as well:

Model	Analog Devices PlutoSDR Rev.B (Z7010-AD9364)
Serial	104473dc59930013faff060082672a485b
Build	v0.30
Linux	Linux pluto 4.14.0-41915-gc2041af#279 SMP PREEMPT Mon Jan 14 13:13:47 CET 2019 armv7l GNU-Linux;2 core(s)
U-Boot	U-Boot PlutoSDR v0.20-PlutoSDR-00043-gefdb9e8 (Apr 24 2018 - 16:16:28 +0200)
FPGA	2018_r2-13-g40139
Root FS	2018.02.1-191-g2e48
IIO	Library version: 0.17 (git tag: v0.17)

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Configuration Settings:

For audio input to SDRConsole, I use a Microsoft LifeChat USB Headset. These are cheap and easy and just work!

So far, I have transmitted on 6M (yes it's below the spec, but works!), 2M, 222, 432, 903, 1296, 2304, 3456 and 5760 with the Pluto. I've actually generated a signal on 10 GHz (10.368 GHz) as well using 3456 MHz. ($3.456 \times 3 = 10.368$). It turns out, the odd order harmonic output (3, 5, 7 etc.) of the Pluto are very high. So we use this to our advantage with proper filtering.

This has been a quick and dirty look at the Pluto. It's a lot of bang for the buck!

Upcoming Events

(*Tentative – Dates and Events will be added as they become available)

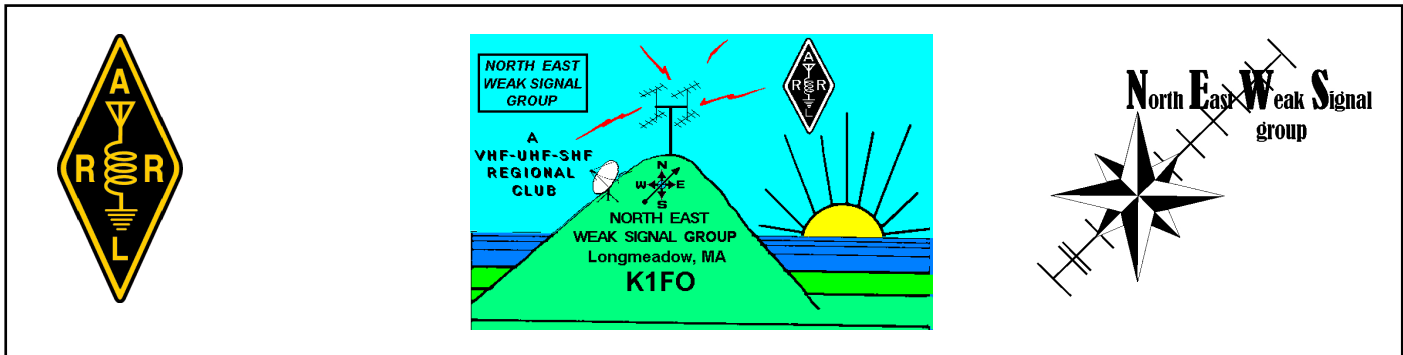
Jan 12	NEWS Lunch and Board Meeting - Lulu's, Enfield, CT - 11:15am
Jan 12	NEWS General Meeting, Storrs Library, Longmeadow, MA, 1pm
Jan 19-21	ARRL VHF Contest
Feb 8-10	Hamcation, Central Florida Fairgrounds, Orlando, FL
Mar 23	NEWS Lunch and Board Meeting, Lulu's, Enfield, CT, 11:15am
Mar 23	NEWS General Meeting, Storrs Library, Longmeadow, MA, 1pm
Apr 25-28	VHF Super Conference II,
May 3-4	NEAR-Fest - Deerfield, NH
May 17-19	Hamvention, Xenia, Ohio
May 27	Memorial Day
June 8-10	ARRL June VHF Contest
June 22-23	ARRL Field Day
July 13	NEWS Picnic and Meeting, K of C, Washington Rd, Enfield, CT, 11am
Aug 3-4	ARRL 222MHz & Up Distance Contest
Aug 17-18	ARRL 10 GHz & Up Contest Weekend #1
Sept 14-16	ARRL Sept. VHF Contest
Sept 21-22	ARRL 10 GHz & Up Contest Weekend #2
Sept 28	NEWS Lunch and Board Meeting, Lulu's, Enfield, CT, 11:15am
Sept 28	NEWS General Meeting, Storrs Library, Longmeadow, MA, 1pm
Sept 29-30	ARRL EME Weekend #1, 2.3 GHz & Up
Oct 12-13	NEAR-Fest - Deerfield, NH
Oct 27-28	ARRL EME Weekend #2, 50-1296 MHz
Nov 23	NEWS Lunch and Board Meeting, Lulu's, Enfield, CT, 11:15am
Nov 23	NEWS General Meeting, Storrs Library, Longmeadow, MA, 1pm
Nov 24-25	ARRL EME Weekend #3, 50-1296 MHz
Nov 30-Dec2	ARRL 160-Meter Contest

NEAR-Fest XXV

Hello Winter-weary club members! Flea market and conference season is upon us and it's time to make a plan for NEAR-Fest XXV - Friday and Saturday, May 3-4. Last May, Lanette & I roped off a selling area for club members who signed up, and a few extras had to squeeze in. Please email your intentions to join us in Deerfield, as I need to reserve the required number of spaces by "tax day". Thanks and don't forget to sign up for the "Super Conference" as well. Hope to see you at the meeting on March 23rd.

73's Don W1FKF

Donw1kf-news@yahoo.com



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 six meetings per year, held at a centrally located facility and provide a "NEWSLETTER" that is distributed two weeks prior to each meeting. Any contributions to this publication are appreciated and can be sent to: George Collins, KC1V by e-mail to news.kc1v@gmail.com. Dues are \$10/year. Remember, this group is formed by VHF'ers for VHF'ers.

Mail to:

North East Weak Signal Group
 c/o N2OY, John Crawford
 PO Box 1112
 Latham, NY 12110

North East Weak Signal Group

c/o N2OY John Crawford, PO Box 1112, Latham, NY 12110

Check your membership
Expiration date on your mailing label!