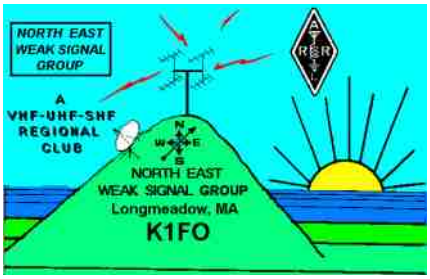

N.E.W.S. LETTER

The Official Publication of the North East Weak Signal Group – N.E.W.S. - Home (newsvhf.com)

September 2024	Volume 32	Issue 4

Next Meeting: September 28, 2024.

In This Issue

GENERAL MEETING - STORRS LIBRARY -

1 PM to approximately 3:45 PM.
693 Longmeadow St, Longmeadow, MA 01106
https://www.longmeadowlibrary.org/

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

DON'T FORGET

The North East Weak Signal Group 2 Meter Net
Every Thursday at 8:30 PM local 144.250 MHz
K1BXC Net Control

MEMBERSHIP in the N.E.W.S Group is $10 per 2 years.
Apply to George Collins, KC1V. E-mail: **news.kc1v@gmail.com**.
You may download an application from our web page: **http://www.newsvhf.com**

Send articles by e-mail to Don W1FKF at **donw1fkf-news@yahoo.com**.

REMINDER: 222 MHz Activity Night Tuesdays 7 to 11 PM

September VHF Contest **(September 14-16, 2024)** https://www.arrl.org/september-vhf

Secretary minutes

NEWS Picnic 13 July 2024
at Knights of Columbus, Enfield, CT
Called to Order by President W2AAU at 1311
TREASURER
Balance $3024
NEW BUSINESS
MOTION by W1GHZ - to donate $250 to support Social Hour at EME2024 Conference organized by PackRats.
UNANIMOUS
Adjourned 1320
MDS testing run by Tom Williams, WA1MBA


W1AIM


W1AIM

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.....

Weekly Calendar

Mon. Packrats Nets start at 7:30pm on 6 meters, 8 pm on 144.150, etc. Philadelphia area.
Tues. Mud Toads Net FM 17, Virginia 8 pm 144.250
Tues. Activity Night 7:30pm 222.100 K1WHS +
Weds Activity Night 432 K1FMS (N1DPM) +
Thurs. NEWS net, 8:30pm 144.250
Sat. Chesapeake Net 144.205 W3BFC FM28 9 pm
144.205 Mornings 8:30-9:30 AM -- 144.205 , 144.190, ME, Canada to NC and out to OH, WV

Officers:

President Dick Frey, WA2AAU, Delanson, NY
Vice Pres. Eric Mazur, KA1SUN, Savoy, MA

Treasurer George Collins, KC1V, Somers, CT
Secretary Paul Wade, W1GHZ, Cabot, VT

Board Of Directors:

Tom Cefalo W1EX N Reading MA

Tom Williams WA1MBA Orleans, MA
Bob Bownes KI2L, Troy, NY
Mark Casey K1MAP, Hampden, MA


W1AIM & W1GHZ working Block Island

from a hillside in Vermont. 367km
W1GHZ

MDS Testing
July 13, 2024 NEWS GROUP PICNIC and ANNUAL MEETING

Tom Williams WA1MBA

The MDS testing at the annual meeting & picnic this year was fun and work as usual. I didn't run into any equipment or operator problems, so that part went well. I want to thank Don W1FKF, Lanette KA1NKD, and Stan W1LE for all their help in setting up and operation.

This year we had many radios that were tied or nearly tied on each band for most sensitivity. I colored those cells in the table. Our test does not measure the mathematically defined MDS because we also rely on the operator to determine when he/she loses the signal, and all our ears are different. People have described this quality as the trained ear's ability to narrow the effective bandwidth. The MDS we measure is the "radio with operator" MDS.

	MDS TESTING JULY 13, 2024. NEWS GROUP PICNIC							
	Call	**Dish Type**	**Dish Size**	**Power**	**MDS**	**TX**	**Comment**	**BAND**
					Lower (more negative) =Better	Higher (less Negative) =Better	Baseline added into MDS	**GHz**
					Below Baseline		Baseline -40	
1	W2BYP	Prime	12"	3W	-26	-50.7	John	10
2	KA1PQK	Prime	14"	1W	-28	-38.9	Jay	10
3	KC0IYT #1	Offset	18"	3W	-33	-41.7/-42.7	2 Tx Levels	10
4	KC0IYT #2	Offset	¾ M	8W	-33	-60.2		10
5	WZ1V	Offset	18"	2W	-36	-47.7		10
6	W1FKF	Offset	18"	8W	-36	-32.2		10
7	WW1Z	Horn	20 dB	1W	-16	-58.7		10
8	K2AEP	Offset	22"	115 mW	-35	-53.7		10
9	KA1SUN	Prime	24"	2.5W	-16	-37.7		10
10	AF1R	Offset	18"	3W	-26	-51.7		10
11	AF1T	Prime	24"	10W	-49	-30.2		10
12	K1OR	Offset	20"	6W	-47	-33.7		10
13	K1FMS	Prime	30"	16W	-45	-33.2		10
14	VE2UG	Offset	26"	15W+	-37	-34.7		10
15	W1GHZ	Offset	18"	3W	-37	-38.7		10
16	W1VLF	Prime	24"	2.7W	-39	-39.7		10

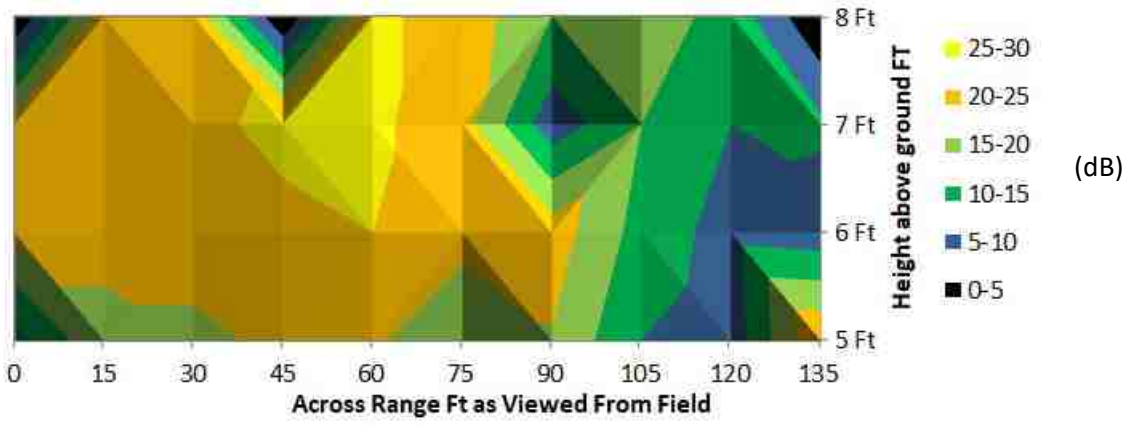
					Below Baseline		Baseline -30	
1	W2BYP	Prime Cas	12”	2W	-39	-75.2		24
2	VE2UG	Offset	26”	4W	-39	-52.2		24
3	KC0IYT	Offset	18”	2W	-25	-63.7		24
4	W1FKF 1	Prime	24”	1.75W	-45	-51.7		24
5	W1FKF 2	Offset	18”	500mW	-42	-48.7		24
6	W1GHZ	Offset	18”	1.5W	-47	-53.7		24
7	AF1T	Prime	12”	2W	-47	-65.2		24
8	KI2L	Prime	24”	3W	-33			24
9	K1OR	Offset	20”	2.5W	-47		No Tx	24
11	K1OR	Prime	12"	1.5W	-33	-62.7		24
12	K1FMS	Prime	21”	2W	-47	-46.7		24
13	K1FMS	Prime	12”	1W	-42	-50.2		24
14	W1VLF	Prime	12”	2w	-36		No Tx	24

	Call	**Dish Type**	**Dish Size**	**Power**	**MDS**	**TX**	**Comment**	**BAND**
					Lower (more negative) =Better	Higher (less Neg-ative) =Better	Baseline added into MDS	**GHz**
					Below Baseline		Baseline -30	
1	W2BYP	Prime	12”	50mW	-18	-47		47
2	W1GHZ	Prime Cas	12”	30mW	-21	-77.7		47
3	KA1OJ	Prime	10”	80mW	-27		No Tx	47
4	W1FKF	Prime	12”	30mW	-37	-62.7		47
5	K1OR	Prime	12”	74mW	-29	-78.2		47
6	WA1MBA	Prime	10”	40mW	-13	-87.2		47
7	KC0IYT	Prime	10”	46mW	-27	-145/ -94	Redo of MDS	47
8	AF1T	Prime Cas	12”	30mW	-39	-67.2		47
					Below Baseline		Baseline -10	
							With HORN	
1	KA1OJ	Prime	12”	6mW	-7		No LNA No TXTest	78
2	N1JEZ	Prime	10”	2mW	-43		No TX Test	78
3	WA1MBA	Prime	10”	100mW	-46	-66.2		78

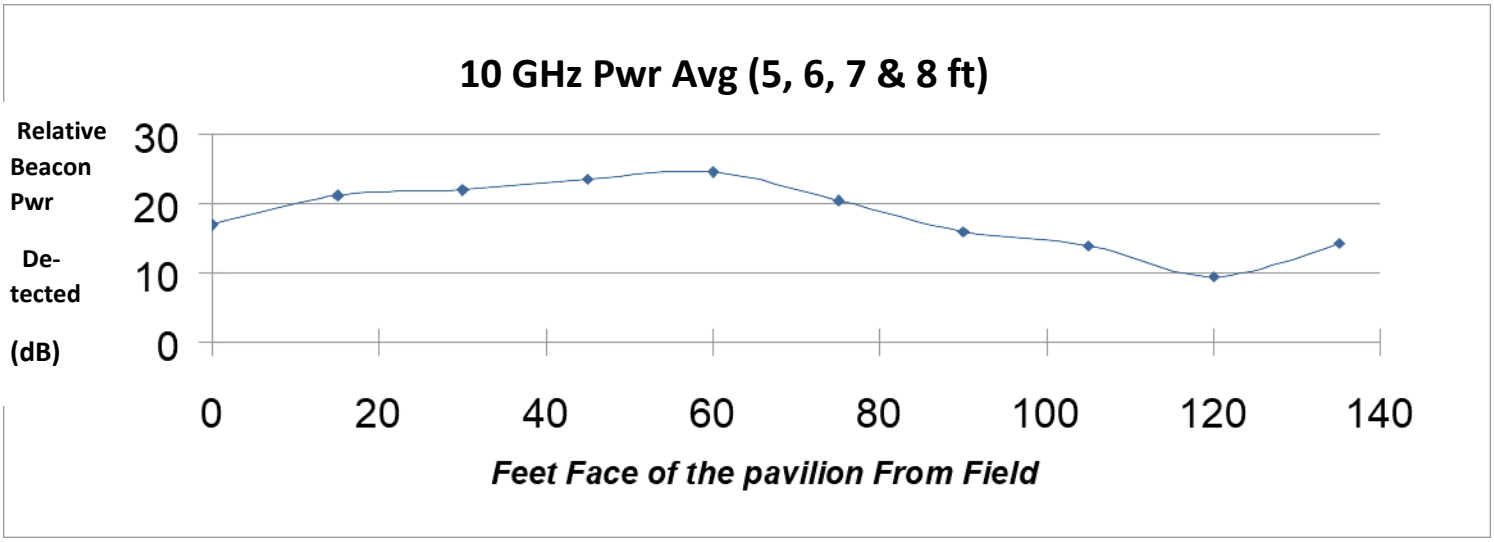
HOW FLAT IS THE SIGNAL ACROSS THE PAVILION?

Don W1FKF and I tried to get a rough measure of the relative strength of the 10 GHz MDS signal across the front of the pavilion prior to performing the MDS testing this year. Although the results are rough (I counted paces and estimated the heights we placed the horn) we did see some remarkable differences.

I have plotted these early results and show them below. The left side is the left side as viewed from the MDS setup and the top is the top. Colors help identify the values which are in ranges of (comparative) dB. The graphing program fills in the contour color based on the recorded values which were taken at the vertices in the graph (at the corners of every square).



If we assume that these data are valid, then there are at least two problem spots and a definite peak area. Also, this agrees with the ability to improve by adjusting antenna height. If these data are indicative of the magnitude of the non-uniformity, then comparisons between stations is at least



questionable. Don and I are thinking of a way to do a more precise measurement next year for a more thorough analysis. Even if these data are "correct", they probably do not hold for other bands.

Pack Rats NEWS Letter

Mt. AIRY V.H.F. RADIO CLUB, INC.

CHEESE BITS

Looking for Club Call Trustee

Must be control op for beacons (now on RR property). Is a younger person willing?
Renewal is next year.

for more info Contact Ron WZ1V wz1v@arrl.net

Club looking for someone to do the paperwork to get Massachusetts DRC Permits for access to mountain tops during VHF/UHF/ Microwave Contests

Permits are required to operate from Top of Mt Wachusett, Mt Greylock and others locations **More info Contact : Don W1FKF donw1fkf-news@yahoo.com**

Club Commission Program

Each new ARRL STANDARD membership earns the club a $20 commission (family, student/youth, and blind memberships are not eligible). New members are defined as never having been a member or a returning member that has not been a member for two years. Each renewal now earns the club a $5 commission. There is no limit to the amount a club can earn in this program.

Members can renew anytime without losing any of their membership time. Details and forms are available on the ARRL web site, at www.arrl.org/affiliated-club-benefits. FAQs are also available to help explain the program. It does take some effort and a bit of paperwork, but the club reaps the reward in cash. If your affiliated club is not participating in this program, ask them to investigate it.

10 GHz and Up Operators. The Round TWO 2024 ARRL 10 GHz and Up

September 21 at 0900 UTC to September 23 0759 UTC.

DATA ENTRY. The link at https://w3sz.com/k1rz/getUpdateForm.htm .

K1MAP FN32SB
Beacon

Hampden, Mass

10368.320 MHz

slot antenna,

470' amsl, 40'agl

FSK - FT8 - Carrier

1.70 watts

10 GHz Slot Antenna Water Proof Housing

(Radome)

Aviation Highly Flexible Clear Teflon Convoluted Tubing 1.25" P/N m81914/3-1012

Don W1FKF

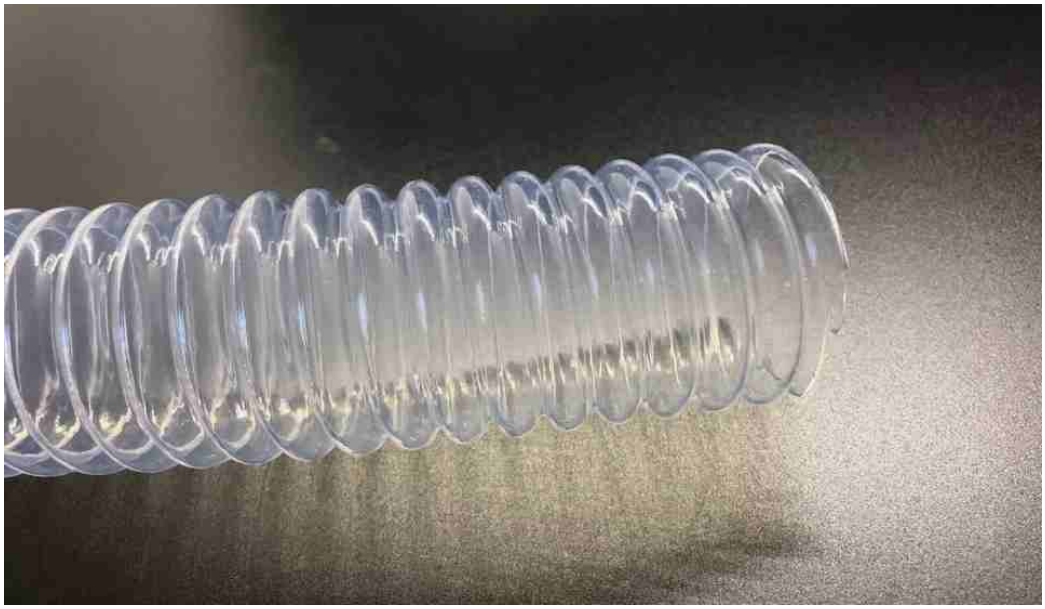
Donw1fkf-news@yahoo.com

FEP Convoluted Tubing (AMS-DTL-81914/3)

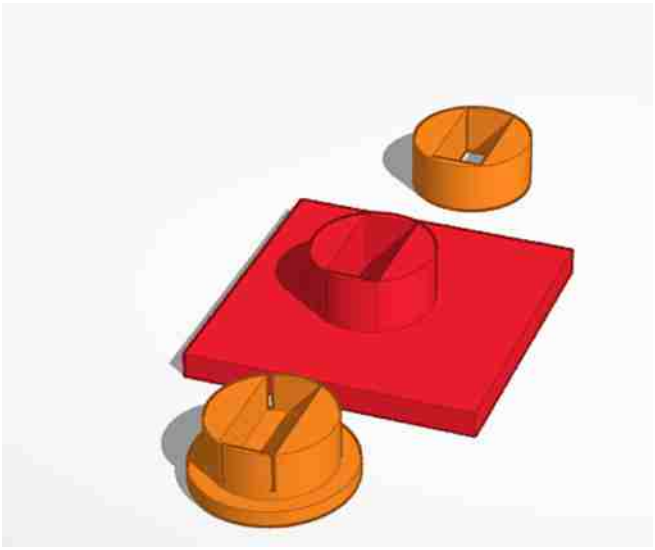
(Standard tubing is natural)

Part Number	MIL Spec*	Maximum Inside Diameter		Minimum Inside Diameter		Maximum Outside Diameter		Maximum Wall Thickness		Minimum Bend Radius		Pitch	Weight p/100 ft.	
		Inch	MM	Inch	MM	Inch	MM	Inch	MM	Inch	MM	±1	Lb.	Kg.
81914/3-1001-NT	-01	.187	4.75	.181	4.60	.320	8.13	.018	.457	.500	13	8	1.5	2.23
81914/3-1002-NT	-02	.281	7.14	.273	6.93	.414	10.5	.018	.457	.750	19	8	1.7	2.53
81914/3-1003-NT	-03	.312	7.93	.306	7.77	.450	11.4	.018	.457	.750	19	8	1.9	2.83
81914/3-1004-NT	-04	.375	9.53	.364	9.25	.510	13.0	.018	.457	.875	22	8	2.2	3.27
81914/3-1005-NT	-05	.437	11.1	.427	10.9	.571	14.5	.018	.457	.875	22	8	3.1	4.61
81914/3-1006-NT	-06	.500	12.7	.485	12.3	.650	16.5	.023	.584	1.25	32	7	4.0	5.95
81914/3-1007-NT	-07	.625	15.9	.608	15.4	.770	19.6	.023	.584	1.50	38	7	4.8	7.14
81914/3-1008-NT	-08	.750	19.1	.730	18.5	.930	23.6	.023	.584	1.75	44	6	6.1	9.07
81914/3-1009-NT	-09	.875	22.2	.860	21.8	1.073	27.3	.023	.584	2.00	51	5	7.0	10.4
81914/3-1010-NT	-10	1.000	25.4	.975	24.8	1.226	31.1	.023	.584	2.37	60	5	8.5	12.7
81914/3-1011-NT	-11	1.125	28.6	1.105	28.1	1.390	35.3	.023	.584	2.37	60	5	9.3	13.8
81914/3-1012-NT	-12	1.250	31.8	1.210	30.7	1.539	39.1	.023	.584	2.75	70	4	10.9	16.2
81914/3-1013-NT	-13	1.500	38.1	1.437	36.5	1.832	46.5	.023	.584	3.38	86	4	12.6	18.8
81914/3-1014-NT	-14	1.750	44.5	1.688	42.9	2.082	52.9	.023	.584	3.88	98	4	14.8	22.0
81914/3-1015-NT	-15	2.000	50.8	1.937	49.2	2.332	59.2	.023	.584	4.25	108	4	16.8	25.0

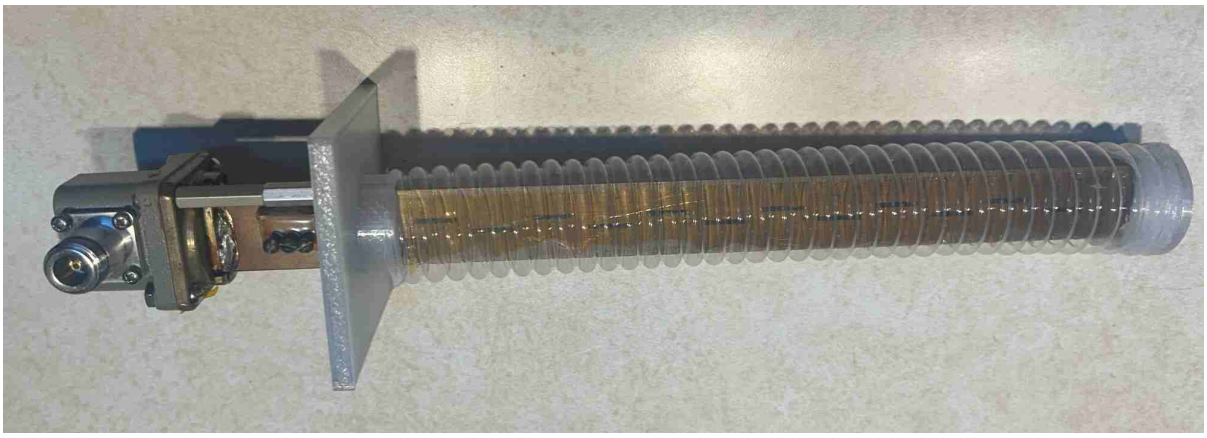
Continuous Operating Temperature: -88 to 392°F/-67 to 200°C FEP convoluted tubing is provided in NATURAL without cuffs direct from inventory. Natural part numbers are designated with "NT" after the Mil Spec number (ie 81914/3-1014-NT). Colors and/or custom cuffs are quoted upon request. Stock packaging is random coils.



3D printed Slot Antenna Tube Supports



Mount in Box or other Enclosure



GaAsFET LNA Bias – Simple, Cheap, and Fool-resistant

Paul Wade, W1GHZ ©2024
w1ghz@arrl.net

Last year, I read an article[1] about negative bias for GaAsFETs and newer low-noise devices , using an optoisolator to generate the negative voltage. Recently I've been playing with an LNA for 10 GHz. I remembered the article and thought I'd give it a try.

How does it work? Many of us know that all diodes are light-emitting, at least for a very short time. All semiconductor junctions are light sensitive, so most devices are in light-proof packages. An LED is fabricated to emit light efficiently; it also produces a voltage if illuminated with a bright light – try it. An optoisolator contains an LED and a light-sensitive transistor; current through the LED normally causes the transistor to switch, but if we can get to all three terminals of the transistor, we can use the voltage generated instead.

The article suggested that connecting the LED in the optoisolator in series with the FET current could ensure that the FET would never operate without bias. I took it a bit further and came up with a bias circuit that is pretty fool-resistant (nothing is foolproof – there is always a bigger fool). The schematic diagram is shown in Figure 1.

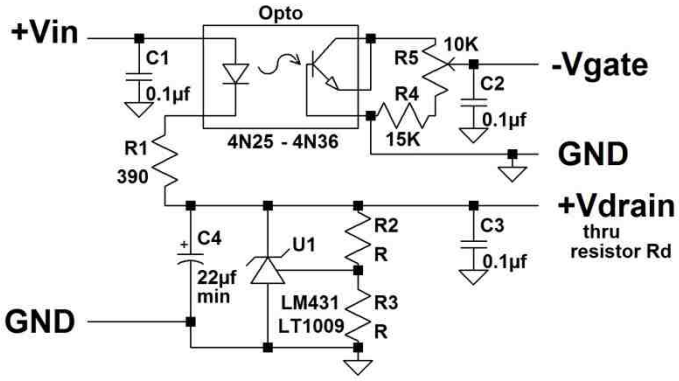


Figure 1 – Simple, Cheap, and Fool-resistant GaAsFET bias circuit

The total parts cost from Mouser should be about $2. I made a simple printed circuit board shown in Figure 2 and tested it with a couple of different optoisolators that I had on hand. They work as expected with my LNA prototypes.

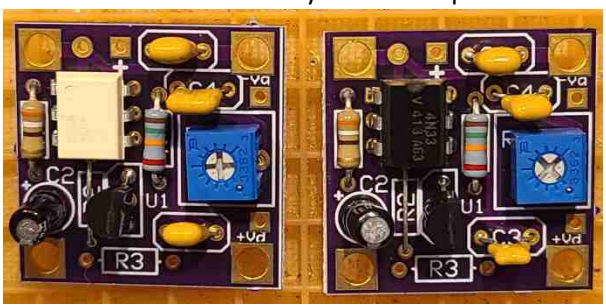


Figure 2 – PC Boards

How does it work?

The FET (or other fancy name low-noise device) drain current passes through the optoisolator, through R1 which limits total current, to an LM431 shunt voltage regulator, which limits maximum voltage. The optoisolator generates about 0.5 volts with a maximum current of around 50 microamps – plenty, since the gate should draw zero current. A typical LNA has a 51 ohm resistor in series with the drain, dropping the drain voltage, so the shunt regulator should be set to provide the desired operating voltage at the drain.

The device I am using, the CEL CE3512 Super Low Noise FET, is specified to operate at 2 volts and 10 milliamps. A current of 10 mA through the 51 ohm drain resistor is about 0.5 volts drop, so the shunt regulator voltage should be 2.5 volts. The LM431 (or TL431 equivalent) operates at 2.5 volts when R2 is zero and R3 is left open. The LM431 needs at least 5 mA for good regulation, so R1 is chosen to set the total current to at least 15 mA. For stability, C4 must be at least 22 uF. The gate voltage for

10 ma is about ─0.4 volts. With R4 and R5 values shown, the gate voltage is adjustable from ─0.3 to ─0.5 volts. Bias adjustment is simple: turn the pot until the drain voltage is 2.0 volts – current must then be 10 mA.

For higher FET voltage, the LM431 is set to a higher voltage by R2 and R3:

$$Vreg \approx 2.5 * (1 + R2/R3)$$

Failsafe: maximum FET voltage is the shunt regulator voltage, and maximum FET current is limited by R1 to design current plus 5 mA or so.

Design Procedure

For a desired drain voltage Vd and current Id:

Vreg = Vd + (Id * 51) [assuming a 51 ohm series resistor in LNA]

R1 ≤ (Vsupply – Vreg – 1.2) / (Id + .005) [1.2 volts for optoisolator, 5 mA for LM431]

Example

Tommy, WD5AGO, wants to use a higher IP3 device that operates at Vd=3.5V and Id = 40 mA.

Vreg = 3.5 + (.04 * 51) = 5.5 volts

R2 = 12K and R3 = 10K will produce 5.5 volts

R1 ≤ (12 – 5.5 – 1.2) /(.04 + .005) = 228 ohms [220 ohms is standard value]

Higher bias voltage

The optoisolator only generates about –0.5 volts. If a higher negative voltage is needed, simply add another one in series:

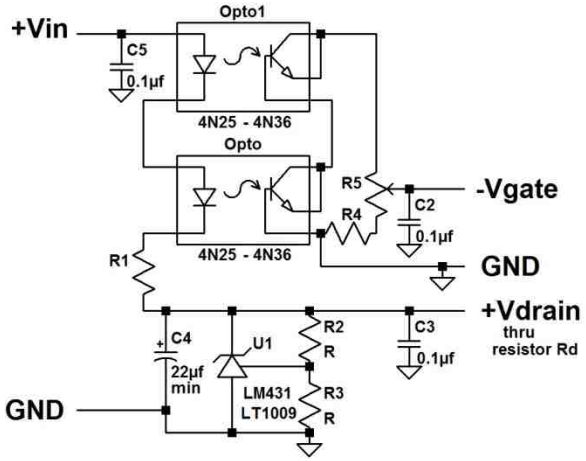


Figure 3 – Bias circuit with higher negative output voltage

The second optoisolator increases the voltage, but not the maximum current, so R4 + R5 should total at least 50K ohms.

Summary

This simple circuit provides negative bias voltage for an LNA without the need for voltage inverters and noisy switching power supplies. It is cheap and easy to build and fool-resistant.

Note

1. Aljaž Blatnik and Matjaž Vidmar , “Photovoltaic Bias for Depletion-Mode Devices in Low-Noise Amplifier Applications,” *IEEE Microwave Magazine,* March 2023, pp. 44-51.

Calender 2024

eptember 9, 1900-2300 Local - 144 MHz Fall Sprint

September 14-16, 1800Z-0300Z - ARRL September VHF QSO Party

September 17, 1900-2300 Local - 222 MHz Fall Sprint

eptember 25, 1900-2300 Local - 432 MHz Fall Sprint

September 28, 1PM - 4PM - N.E.W.S. Group Meeting

October 3-5 - Microwave Update 2024 - Vancouver, BC

October 5, 0600-1300 Local - Microwave Fall Sprint

October 11-12 - New England Amateur Radio Festival - Deerfield, NH

November 18 - Leonids meteor shower

November 23, 1PM - 4PM - N.E.W.S. Group Meeting

December 13 - Geminids meteor shower

Microwave Update 2024

October 4 & 5, 2024

NEAR-Fest XXXVI

Hillsborough County 4H Fairgrounds

New Boston, NH

Registration

Time is running out!

Registration for the Microwave Update conference is now open. Sign up to reserve a spot now and secure the early bird pricing!

Early Bird pricing expires 2359 PST September 2 2024!

On September 3 2024 the conference price will be $325 CAD and extra banquet tickets will be $100 CAD

Our Banquet speaker is Scott Tilley VE7TIL.

When you are done don't forget to go to the hotel tab and book your hotel.

To book optional social activities click this link Social tours and events

You may need some travel documentation to enter Canada. If you are not sure use this link to see what the requirements are.

Visa requirements for Canada

Use the **Registration** form to reserve your spot at the conference.

View the current list of **registrations**.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MICROWAVE
LIVE OAK, FLORIDA
AMATEUR RADIO EQUIPMENT
FOR 50MHZ AND ABOVE


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TIMES MICROWAVE SYSTEMS
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DAIWA


MOUSER
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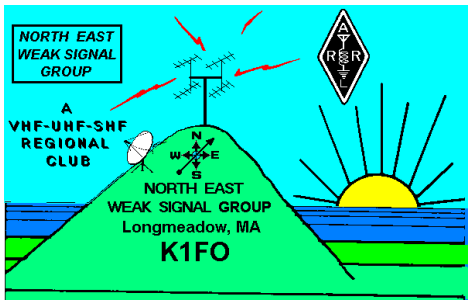
ISO 9001 ISO 14001 AS9100 Certified


YAESU
The radio



North East Weak Signal group

MEMBERSHIP APPLICATION

Date: _____

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 was established in 1993 to form a camaraderie among fellow VHF-UHF-Microwave enthusiasts and support a convenient means to exchange technical information. We currently have six meetings per year, 4 are held on at the Storrs Library on Rt. 5 in Longmeadow, Mass., 1 at our annual Conference in April, and 1 at our Annual Picnic in July. We provide a "NEWSLETTER" that is distributed via email two weeks prior to each meeting. Any contributions to this publication are appreciated and can be sent to: Don, W1FKF by e-mail to donw1fkf-news@yahoo.com
Dues are $10 for 2 years. Please contact or mail application to: NEWS Treasurer, George Collins, KC1V, 105 Ninth District Rd., Somers, CT 06071 or E-mail: news.kc1v@gmail.com

Mail to

Treasurer

North East Weak Signal Group
c/o George Collins
105 Ninth District Road
Somers, CT 0607

news.kc1v@gmail.com

NEWSLetter

North East Weak Signal Group
c/o Don Twombly, W1FKF
32 Bumfagon Road
Loudon, NH 03307

donw1fkf-news@yahoo.com