

N.E.W.S. LETTER

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

September 2016

Volume 25

Issue 5

NEXT MEETING: September 24, 2016

Attention

The Proceedings from the EME2016 Conference in Venice, Italy, as well as a video of the presentations, are available at:

<http://www.eme2016.org/index.php/file-repository/>

In This Issue

Officer's Reports:	page 2
NEWS 2016 Picnic MDS Testing Results: Don Twombly, W1FKF	page 2-3
Calendar of Events: Scott Casey, K1MAP	page 3
NEWS Group Facebook Page URL:	page 3
Band Decoder Interface for the FT-991: Ron Klimas, WZ1V	page 4-5

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.wordpress.com>

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 \$15 per year.
Apply to John Crawford, N2OY. E-mail: n2oy.vhf@gmail.com.
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.
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Send articles by e-mail to George Collins, KC1V at kc1v@arrl.net

Secretary's Report

- NEWS meeting 9 July 2016 (Picnic) at Knights of Columbus, Enfield, CT
- President WA2AAU called meeting to order at 1306 EDT

TREASURERS REPORT – N2OY

- Currently 97 paid members
- Balance \$4857

ANNOUNCEMENTS

- K1BXC - peak reading modification is available for Bird wattmeter
- K1IIG - has three beacons running in CT
- UHF Contest - 1st weekend in August

NEW BUSINESS

- WA1MBA - threat to 47 Ghz band; there was a discussion of starting beacons.

BUSINESS MEETING ADJOURNED 1323 EDT

MDS TESTING

The meeting was Followed by MDS Testing on 10, 24, 47, and 78 GHz by W1FKF, N1JEA, N2OY, and N1FSK

Treasurer's Report

Our membership numbers and treasury remain healthy, and renewals are just around the corner. While membership renewals won't be due until the end of the year, if you're interested in renewing early for another year, I will be accepting cash, check, or (via PayPal Here) credit/debit cards at the September meeting. You can also renew via mail with a check made out to 'North East Weak Signal Group' and sent to the address on the last page of the NEWSletter, by PayPal payment to treasurer@newsvhf.com or, also by PayPal, at <https://paypal.me/NEWSVHF/>

See everyone at the meeting on September 24!

73,
John, N2OY
Treasurer

N.E.W.S. Picnic MDS/ERP Testing

Don W1FKF

donw1fkf-news@yahoo.com

MDS (Minimum Discernable Signal) and ERP testing on 10 GHz, 24 GHz. and 47 GHz. To test for MDS, we set up a distant signal source. After everyone has a chance to peak up on the signal, the signal level is reduced one dB at a time. At the point when you can no longer hear it, you have found the MDS for your system. You decide how well it works, and whether you can hear as well as Don and Dale.

We also check relative ERP, transmitting one at a time and recording the relative power received at the distant point using a spectrum analyzer. The test crew was W1FKF, N1JEZ, N2OY, N1FSK, W1EX and W1GHZ.



NEWS Group 2016 Picnic Testing Results

Sorted by MDS						Sorted by TX Relative Radiated Power					
Band GHz	Call	Dish Type	Dish Size inches	MDS dB	Diff. dB	Call	Dish Type	Dish Size inches	Power Watts	TX dB	Diff. dB
10	af1t	prime	24	-57	0	kc1sj	prime	24	3.4	-33.4	0.0
10	w1fkf	offset	18	-55	-2	w1ghz	offset	24	6	-34.1	-0.7
10	n1jez	prime	20	-55	-2	af1t	prime	24	10	-35.3	-1.9
10	w1ghz	offset	24	-54	-3	n1jez	prime	20	4.5	-35.5	-2.1
10	n1dpm	prime	27	-54	-3	w1fkf	offset	18	2.5	-36.6	-3.2
10	wa1mba	offset	18	-53	-4	wa1mba	offset	18	2.5	-37.9	-4.5
10	kc1sj	prime	24	-51	-6	wb2byp	prime	22	20	-40.0	-6.6
10	wb2byp	prime	22	-45	-12	n1dpm	prime	27	0.7	-44.4	-11.0
10	w1jhr	panel	12	-39	-18	wa1dmv	prime	24	2	-54.3	-20.9
10	ww1z	horn	20 dB	-36	-21	ww1z	horn	20 dB	1	-56.5	-23.1
10	wa1dmv	prime	24	-36	-21	w1jhr	panel	12	1.25	-67.1	-33.7
24	af1t	prime	12	-57	0	af1t	prime	12	2	-36.1	0.0
24	w1fkf	offset	18	-55	-2	n1jez	prime	20	2	-36.4	-0.3
24	n1jez	prime	20	-53	-4	w1fkf	offset	18	0.5	-39.7	-3.6
24	w1ghz	offset	18	-53	-4	w1ex	prime	12	0.5	-48.1	-12.0
24	wb2byp	prime	22	-47	-10	w1ghz	offset	18	0.5	-48.4	-12.3
24	w1ex	prime	18	-47	-10	wa1mba	offset	18	2	-55.6	-19.5
24	w1jhr	prime	12	-47	-10	wb2byp	prime	22	2	-70.0	-33.9
24	wa1mba	offset	18	-45	-12	w1jhr	prime	13	0.03	-71.7	-35.6
47	wb2byp	prime	12	-61	0	n1jez	prime	9.8	0.035	-73.1	0.0
47	n1jez	prime	9.8	-58	-3	wa1mba	prime	15	0.03	-74.3	-1.2
47	wa1mba	prime	15	-57	-4	wb2byp	prime	12	0.04	-76.3	-3.2
47	w1ex	prime	12	-55	-6	ka1oj	prime	10	0.04	-78.3	-5.2
47	ka1oj	prime	10	-55	-6	w1fkf	prime	12	0.04	-84.0	-10.9
47	w1ghz	horns	23 dBi	-52	-9	w1ghz	horns	23 dB	0.04	-84.0	-10.9
47	w1fkf	prime	12	-42	-19	w1ex	prime	12	0.002	-93.3	-20.2

Event Calendar

Sept. 17-18	ARRL 10 GHz and Up Contest Weekend-8am to Midnight Sunday
Sept. 19	Fall Sprint 144MHz Monday 7-11pm local
Sept. 24	NEWS Lunch & Board Meeting-Lulu's-Enfield, CT-11:15am
Sept. 24	NEWS General Meeting-Storrs Library-Longmeadow, MA-1pm
Sept. 27	Fall Sprint 222MHz Tues 7-11pm local
Oct. 5	Fall Sprint 432MHz Weds 7-11pm local
Oct. 16	Sunday, Nutmeg Hamfest & ARRL CT State Convention
Oct. 14-15	NearFest, Deerfield, NH fairgrounds
Oct. 14-16	Microwave Update, St. Louis,MO
Oct. 28	Fall Sprint 902MHz & up Sat 8am-2pm local
Nov. 19	NEWS Lunch & Board Meeting-Lulu's-Enfield, CT-11:30am
Nov. 19	NEWS General Meeting-Storrs Library-Longmeadow, MA-1pm

NEWS Group Facebook Page

Fred, N1DPM, has put together a Facebook page for the NEWS Group.

If you haven't already, be sure to checkout it at:

<https://www.facebook.com/North-East-Weak-Signal-Group-423877674482397/timeline/>

A Band Decoder Interface for the Yaesu FT-991

Ron Klimas WZ1V

I recently acquired a Yaesu FT-991 HF-6-2-432 all mode radio, and liked it so much I wanted to fully integrate it into my station. I wanted to use it with 3 different amplifiers and a minimum of 4 different antennas. But the radio has only 2 antenna connectors and one TX ground output for keying an amplifier. The idea of using manual rotary and coax switches was quickly dismissed. I needed something faster and more foolproof.

This radio has a rear 8 pin mini-DIN "TUN/LIN" connector with TX ground and BCD outputs that correspond to band data. An online search provided a logic table of binary outputs by band, see Table 1: (note: it's identical to the FT-857D and FT-897D).

I looked at commercially made "band decoders", but none completely met my needs. I selected a 74HCT138 3-to-8 line decoder IC as the basis of my design. I could apply the "Band D" line to one of the enable pins to fully decode the 12, 10, 6, 2, and 70 cm. bands. By logically "Or-ing" the decoded 10 and 12 M outputs with the "D" line low state indicative of the 160-15 M HF bands, I'd also create an output representing all HF bands to connect an HF antenna or key an HF amplifier. I used NOR gates to expand the single TX Ground output from the radio into 4 separate TX Grounds to selectively key up to 4 different amplifiers, depending on which band is active.

Ham Band	D	C	B	A
160	0	0	0	1
80	0	0	1	0
40/60	0	0	1	1
30	0	1	0	0
20	0	1	0	1
17	0	1	1	0
15	0	1	1	1
12	1	0	0	0
10	1	0	0	1
6	1	0	1	0
2	1	0	1	1
70cm	1	1	0	0

Table 1 Binary Outputs by Band

BS170 N-channel FET's are used as output drivers for amplifier keying and coax relay control. If you're using a modern amplifier, these work fine. However many older vintage amplifiers require a "dry contact". For example my SB-200 has -130 VDC on its keying line. I wound up using a relay with 10A contacts to handle that. My 432 amplifier has +40 VDC on its keying line, so I used a somewhat smaller relay for it.

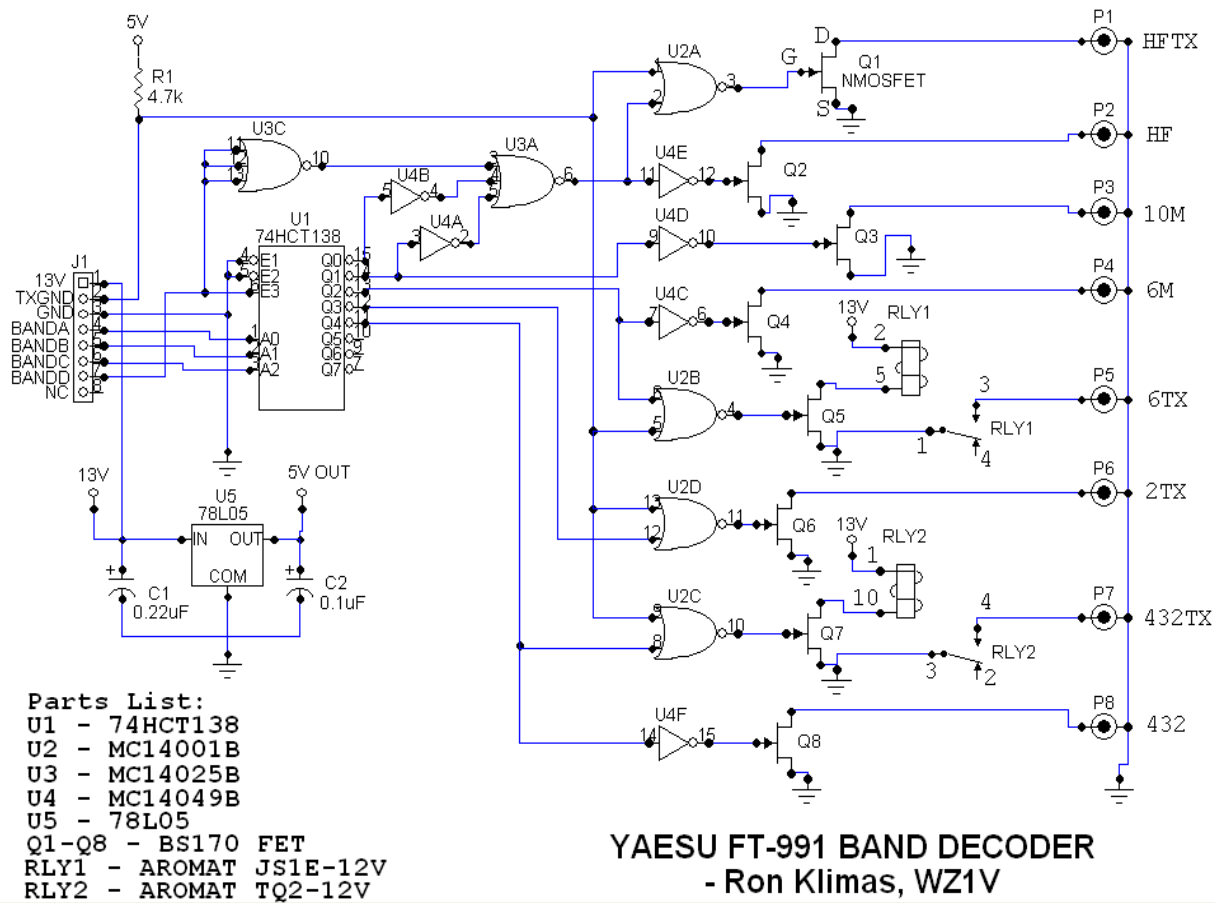


Figure 1: Rear Panel of Band Decoder

the cable. I used the 13 VDC on pin 1 of the radio's TUN/LIN connector to power the entire interface circuit, since the current requirement is minimal.

Note in the circuit diagram J1 has the same pinout as the 8 pin Mini-DIN connector at the radio end of

I used the same external 13.8 VDC power supply that powers my FT-991 to supply +13.8V to the positive ends of Dow-Key coax relays. These draw about 250 mA each.



Note: wire +5 and ground to U1 pin 16 and 8. U2-U3 pin 14 and 7, U4 pins 1 and 8.

Misc. Parts:

- Plug Mini-DIN 8 pin male Jameco 111878 for radio end of cable connected to J1.
- P1-P8 – RCA Jack, panel mount.
- 4 - Wire-wrap 16 pin IC sockets for U1-U4.
- Aluminum project box 5.25" x 3" x 2.125"
- 6-32 ground lug for chassis ground connection to external power supply.

The lower row of 4 RCA jacks connect to key amplifiers for HF, 6M, 2M, and 432 and the upper row of 4 RCA jacks connect to coax relay coils for HF or 6M, 10M, and 432

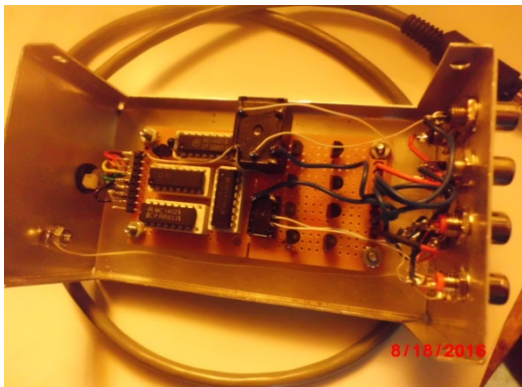


Figure 2: Inside View of Band Decoder

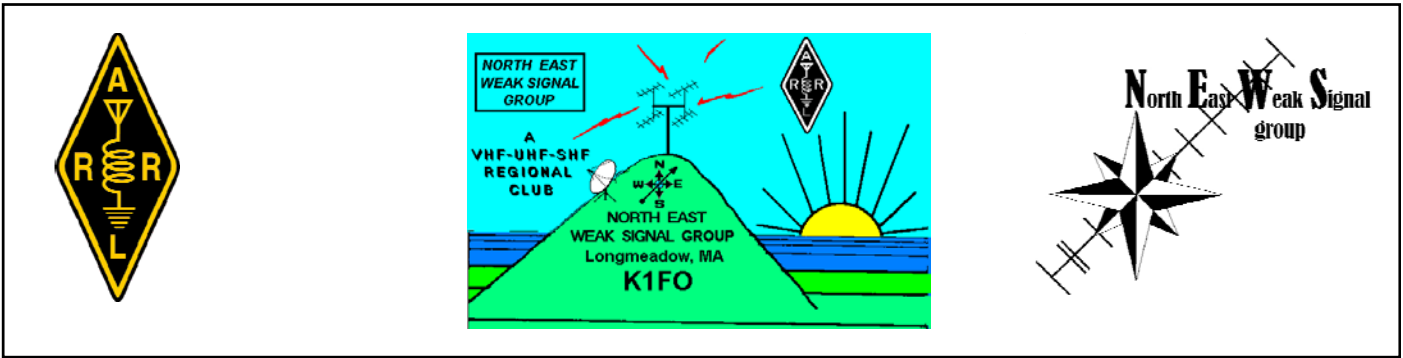
I used 2 coax relays to expand the FT-991's two antenna connectors to four separate connectors for HF, 6, 2, and 432. I connected my 80-10M HF antenna to the NC port of the 6M coax relay and connected it's NO port to my 6M amp input for operation on 6.

I wired the 432 coax relay NC port to my 2M preamp and amplifier. When operating 432 the coax relay closes to the NO port connecting my 432 preamp and amplifier. Both my external preamps are RF sensed types so no sequencing was needed for them. To use the band decoder, you must set the

Menu item for the TUN/LIN connector to LAMP. For some reason Yaesu chose to disable the BCD band data when internal Tuner mode is selected. However, the D line stays low on 160 – 15M so I'm still able to use the internal tuner on those bands without disconnecting anything. I could also use the 10M output on P3 to enable a third coax relay for a dedicated 10M antenna if desired

N.E.W.S. Group Supporters





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 kc1v@arrl.net. Dues are \$15/year. Remember, this group is formed by VHF'ers for VHF'ers.

Mail to:

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 c/o N2OY, John Crawford
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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!