N.E.W.S. LETTER

The Publication of the North East Weak Signal Group

MARCH 1996 VOLUME FOUR ISSUE TWO

NEXT MEETING

THE NEXT MEETING IS ON MARCH 16, 1:00 PM AT THE QUALITY INN, VERNON, CT. THE GUEST SPEAKER WILL BE DAVE ROBINSON, WG3I PRESENTING "24 GHZ NARROWBAND"

ALSO, DON'T FORGET, BRING YOUR PREAMPS, STAN, KA1ZE WILL HAVE HIS N.F. METER AND BRUCE, N2LIV WILL SUPPLY A 10GHZ CONVERTER SO WE CAN MEASURE ALL BANDS!

FUTURE METTINGS

MAY 25, JULY 13, AUG. 24,25 MEETING & CONFERENCE PLUS NOV. 9.

IN THIS ISSUE

WHEN THE SMOKE SETTLES
by Bruce Wood, N2LIV

And the call - KB1BWB went forth with mighty signals throughout the northeast. Our new club call sign has arrived however it may take quite some time before we are able to apply for a change of callsign to W1RJA as discussed in our January meeting.

The January VHF Sweepstakes is over and done with for this year with only the final scores to arise from the smoke. Preliminary tallies by WZ1V indicate the NEWS Group with 31 club entries and an aggregate total score of 1.7 million, up from 1.3 million last year. Many individual scores were up considerably, not only in our club area but also in local surrounding clubs too. Personally, I had only 4 out of my 6 bands operational, with low power on 222 and 432 MHz. I never realized how much work it was to interface multiple transverters to multiple low band rigs. Well there's always the next one. Peruse the summaries inside and lets all start working towards next year and set individual attainable goals for ourselves. If you should need help talk to one of the techie's. I'll keep this short to allow for the contest results which speak for themselves.

Our next club meeting is on March 16, 1996 at 1 PM. Guest speaker will be Dave Robinson, WG3I presenting "24 GHz Narrowband". Anyone with 24 GHz gear, whether complete or under development, please bring it along for discussion.

DUBUS - A Review
Dx Ueberreichweiten Bau von geraten
UHF SHF

A excellent quarterly bi-lingual (German-English) publication from Germany written "by radio amateurs for radio amateurs." This publication deals with the amateur frequencies above 50 MHz. Much emphasis is placed on the higher bands, above 10 GHz up to 241 GHz. Construction articles are for the advanced builder and many do not contain complete details and need studying. Most authors provide PCB's, parts, kits and even completed projects which is a big help. Costs of the PCB's seem competitive with similar US pricing, but many parts are more expensive, although sometimes unique in nature and not available in the US.

Russ Miller, N7ART is the US Distributor. Subscription rates for 1996 are $30. He can be reached at 12041 SW Peninsula Drive, Crooked River Ranch, OR 97760 or (541) 548-1221. In addition, a compendium of previous technical reports has been published as TECHNIK IV Books (1992-1994). An earlier TECHNIK III Book is still available. These are also available through Russ.

I have been receiving this publication for approximately 6 years now and highly recommend it. Many products and techniques available in Europe are brought to our shores through it. In addition, part kits for the upper microwave bands may make them readily accessible for those interested. Several of the NEWS Group members are building DB6NT 24 GHz kits provided therein. Dave Robinson, WG3I has an excellent article in Microwave Update 96, on 24 GHz utilizing many of the DUBUS and G3WDG products. See his article for further DUBUS info and part suppliers of products therein.

BRUCE, N2LIV

SECRETARY'S REPORT January 6, 1996

Our January meeting was a lively one, in spite of cold weather. We had a room of over 45 members and guests.

President, Bruce Wood, N2LIV opened the meeting at 1:15 PM and the first order of business was to elect a replacement Board member for Ed Bristol, W1RJA. Ed's wife, Rae K1LXD was elected to the Board of Director seat.

A vanity callsign for the club was discussed and noted that Rae Bristol has given us permission to use Ed's call. It was voted to preserve the vanity call in Ed's memory -W1RJA- as soon as the FCC initiates the final procedures.

A critical letter appeared in CQ VHF and Dale, AF1T will write a rebuttal.

Emil Pocock, W3EP, has asked for help in siting, building and financing a 2 meter trans-Atlantic beacon that may be on the air by this Summer. Anyone interested in helping out should contact Emil and it appears quite a few members of the group are getting involved in this project.

Stan Hilinski, KA1ZE, announced that he is in need of speakers for the 1996 VHF Conference and that anyone interested should see him before the next N.E.W.S meeting.

Bruce reminded us of the August 1996, International EME Conference which will be held in the Baltimore area.

Dick Frey, WA2AAU, spoke about W2SZ contest group's January efforts outside of the Schenectady and welcomes participation from our members. Quite a few people came down from the Albany area with Dick and there is a good chance that the W2SZ score will be added to our club score in future contests, as most of the W2SZ crew has joined our club! Thank -You and good luck to W2SZ!

Bruce asked for a short break at 2:00PM. After the break Rae Bristol, K1LXD thanked all of the members for the flowers and attendance at Ed's services.

Bruce Wood, N2LIV, our president was our speaker and had prepared and handed out a 50-144-222-432 "primer", listing band plans, calling frequencies, manufacturer listing of rigs, amplifiers, pre-amps, antennas and feedlines. He discussed the building of a station on each of these four bands and what equipment and accessories to look for and what to avoid. Quite a broad topic to take up in one presentation, but Bruce did a super job and I'm sure that the "primer" that he put together will be reprinted and expanded with additional information. The presentation ended at 3:30PM and Stan, KA1ZE, was in attendance with his noise figure meter for anyone wanting to test equipment after the meeting.

Respectfully submitted. Mark Casey, N1LZC Secretary.

ON THE BANDS: by Ron Klimas
WZ1V, FN31mp

The January VHF SS contest: After two months preparation for this event, I thought I was in great shape. I finally had a mast-mounted 2304 station built, debugged, and operational by January. I installed high power Toh-Tsu coax relays actuated by a rotary switch so I could switch bands instantly, 50-2304, with a flip of the wrist. I picked up an AM-6155 from N2LIV and had a smoking 350 watts on 222. I lined up a half dozen or so skeds and went to bed Thursday night confident I was ready to set the world on fire during the contest. What could possibly go wrong?

I arrived home from work Friday night to discover a monsoon packing 80 M.P.H. gusts had completely stripped out my rotor. Useless! I caught KD1DU on 2 that night, and he had even worse news: the storm had bent his garage mounted mast over into the trees, leaving him with only 2m on his tower. Panic time! I figured my new plan would be to get on the phone, to cancel all my skeds, get ahold of Dick Frey to see if I could operate with W2SZ/2, and just hand out a few points from home in between. What a surprise to discover my phone line was down as well. And then the lights went out! Well, at least there was booze in the house. That must have helped - I was up the tower the next morning changing out the motor in the balmy 15 degree breeze. Del, KD1DU was able us his car and a chain saw to pull his antennas out of the trees. Life is good again! Was it worth it? You bet!

Despite poor band conditions, both Del and I turned in our all-time best scores. I grabbed the highest 2304 score in New England, first time out on the band, with only 1.5 watts to a 52 el. looper! Del KD1DU grabbed top single op 2m score in the country, in addition to impressive totals on the other bands! Moral: NEVER say die !

Congrats to all N.E.W.S. members! Many reported they had done their all-time best, and it sure showed up in our club totals - this January the NEWS club broke 1.7 Million, our best club-score ever! Check out the rumored scores listings elsewhere in this issue. By the way, the reason we didn't get the W2SZ score is because despite Dick Frey WA2AAU's gracious invite to our club, not a single soul called him. The ARRL requires 2/3 of a multi-ops' ops to be club-members for inclusion. I don't want hear anyone whining about not having somewhere to operate from again. When someone rolls out the carpet for you, you're supposed to shake their hand and grab the opportunity, folks! Let's make a co-ordinated effort to support W2SZ henceforth!

Not much else - listen for VE2/SM0DFP FN35 Wednesday nights at 9 PM calling CQ on 432.100 if you need that one. Per is active through 2304. Bill AA2UK FM29 will be net control for the PackRats' new microwave bands activity night, meeting on 144.260 the 4th Thursday each month 8-10 pm. Bill and I have been working each other consistently through 2304. I will be co-ordinating a donation of several high power microwave band PA's to our club - I'll have details at our upcoming March meeting.

That's it for now, gang. See you at our March 16 meeting.

Please Send reports of DX or Expeditions to me, Ron Klimas, 458 Allentown Rd., Bristol, CT 06010 or call 860-589-0528 if you have something you'd like to share about an unusual contact, etc. Looking for Ham/Engineering software or tech info? -try our landline BBS at 860-768-4758 (14400,8,N,1 weeknights/weekends). -or our Internet Webpage at http://uhavax.hartford.edu/newsvhf -73, Ron WZ1V, Internet email: klimas@uhavax.hartford.edu

Perhaps you sent a lovely card,
or, sat quietly in a chair,
Perhaps you sent a funeral spray,
If so we saw it there.
Perhaps you spoke the kindest words,
As any friend could say;
Perhaps you were not there at all,
Just thought of us that day,
Whatever you did to console our hearts,
We thank you so much whatever the part
By the family of Ed Bristol WRJA

SILENT KEY W1ZGP

W1ZGP, Bob Leaver, of East Harland, CT passed away Wednesday, January 31, 1996. Bob always had time for a good QSO and was active on HF, 2 meters, 6 meters, 222, 432, and 1296. He was on the air in the January 1996 VHF contest and will be sorely missed by us here in the Hartford-Springfield area as well as by many hams across the northeast.

N1LZC

BEACONS DE NB2T, FN30

Lou, NB2T reports that he has been hearing the beacons!

MONTH:	CALL:	DAYS HEARD:
NOV:	W3VD/B-FM19	19 DAYS
NOV:	WA2UMX/B-FN23	12 DAYS
DEC:	W3VD/B-FM19	10 DAYS
DEC:	WA2UMX/B-FN23	10 DAYS

I think that alot of us underestimate how useful the beacons are. Myself I find them useful not only for checking band conditions but also to make sure my antenna's are aimed correctly, and as a baseline to check the system. I think it would be interesting if all of you would report how you generally hear beacons plus any instances where a band opening is noticed.

In the Winter months at my QTH (FN31fh) I hear 2meter beacons as follows: W3VD 6 to 10 dB above the noise, N4MW (FM17) 4-10 dB, WA2UMX at 40-60dB, W2RTB (FN12) 0-10 dB, and VE2FUT (FN25) most of the time and near the noise.

I would like to include how other stations hear the beacons for note here in the N.E.W.S.letter.

Del, KD1DU

NEWS members w/in 175 mi. JAN. '96 ARRL VHF SS RUMOURED SCORES:
by WZ1V

CALL	WA2TEO	WZ1V	KD1DU	N1DPM	K1TR	K1FO	W1GCI	WB2VVV	AF1T	W1QK	WA1MBA	K1GX	N2DSY
GRID	FN31	FN31	FN31	FN32	FN42	FN31	FN42	FN21	FN43	FN31	FN32	FN31	FN30
CLASS	S	S	S	S	S	S	S	S	S	M/L	S	S	QRP/P
6	231/45	141/33	119/22	70/21	141/25		110/22	73/17	87/19	208/17		77/13	/
2	361/39	255/36	485/41	150/26	247/28	158/25	217/28	275/28	184/22	317/23	181/23	190/21	/
222	98/26	71/17	69/19	58/18	74/19	76/19	61/16	65/18	45/15	62/13		49/14	/
432	142/32	126/23	94/18	86/22	109/20	310/35	89/24	70/16	56/16	117/16	86/21	82/15	/
903	43/17	37/13	20/8	29/13	20/9		20/8	25/9	14/7		27/11	21/7	/
1296	49/17	45/12	27/9	32/12	5/2	34/10	23/8	32/10	16/6		37/11	21/8	
2304	5/4	16/6		13/6	8/4	3/2			6/2		12/4	4/4	
3456				7/4	1/1				2/2		6/4		
5760					1/1						2/2		
10G					3/2				4/2		2/1		
TOTAL	929/180	691/140	814/117	446/122	609/111	578/89	523/108	540/98	414/91	704/69	353/77	444/80	399/65
Score	266,000	174,440	130,816	111,264	106,400	94,874	88,884	82,908	62,699	60,927	60,445	58,320	60,927

CALL	WA2BAH	N2LIV	KB2HQ	N1MUW	WA2TIF	N1BWT	NC1I	W3HHN	N1LZC	KX1C	KA1EKR	N2MSS	WB1FKF
GRID	FN32	FN30	FN32	FN32	FN42	FN42	FN32	FN32	FN32	FN42	FN42	FN31	FN42
CLASS	S	S	S	S	S	S	S	S	S	S	M/L	S	S
6	78/12	81/19	35/8	101/15	90/16	81/14	14/9	72/17	85/15	92/11	81/12	62/12	27/6
2	152/17	186/25	96/16	250/27	192/22	144/17	16/6	128/20	172/16	128/15	128/16	129/18	43/11
222	57/12	47/17	36/9	26/7	32/9	37/12	1/1	42/12	52/10	31/8	37/11	37/9	27/7
432	82/13	66/17	41/5	43/10	77/16	46/10	150/21	57/11	65/8	56/12	63/14	57/10	30/7
903	4/2		10/2			10/4	22/8	1/1		9/4			9/4
1296	8/2		14/4	10/4		9/3	15/7	5/3	7/2	4/2		4/3	11/9
2304	4/2		9/2					1/1					5/3
3456	1/1		8/1				6/2						3/2
5760	3/1		6/2										3/2
10G	8/2		9/1			2/1							5/3
24G	2/1		6/1										
TOTAL	399/65	380/78	270/51	430/63	391/63	329/61	224/55	306/65	378/51	320/51	309/53	389/52	158/50
Score	45,500	38,454	34,935	33,327	31,500	29,463	29,040	27,950	26,979	22,746	21,577	20,332	19,300

CALL	W1RIL	W3EP/1	KA1ZE	NA1W	W1EJ	K1CPJ	N2UAH	N1HOV	W1ORS	W1TDS	WA2ZFH	N1EKV	K1WVX
GRID	FN42	FN31	FN31	FN32	FN42	FN31	FN20	FN53	FN31	FN32	FN30	FN42	FN31
CLASS	S	S	S	S	S	S	S	S	M/L	S	M/L	S	S
6	59/11	128/26			77/15	42/9	95/14	41/10	/		8/4	16/4	12/4
2	25/8	76/18	205/22	76/14	162/20	70/11	124/11	82/17	/	180/30	135/15	39/9	30/3
222	17/4		7/3	13/4	31/12	15/5			/		13/3	8/1	14/3
432	27/8	27/13	35/6	47/12		24/8	44/6	39/11	/		22/3	16/4	24/2
903	18/8		10/3	10/3		7/2							
1296	24/11	8/5	9/2	18/7		10/3							
2304			6/2	5/2		5/2							
3456			4/1	4/2		2/1							
5760													
10G	3/2												
TOTAL	173/52	239/62	276/39	173/44	270/47	175/41	263/31	162/38	?/?	180/30	178/25	79/18	80/12
Score	18,928	17,484	17,355	16,720	14,147	12,874	9,517	7,638	6,300	5,400	5,325	1,854	1,416

Rovers	Score	Totals	Activated	Bands	
AA7QZ/R	8,492	193/44	3 GRIDS	ABCDF	(6,2,222,432,2304)

CABLE LOSS AT 10GHz de WB2VV

Mfg.	Model	Description	Loss/100'	Mfg.	Model	Description	Loss/100'
Andrew	EW90	Elliptical Waveguide	3.19 dB	Times	LMR-500	.500" Foam Diel. Coax	12.5 dB
Andrew	HJ4-50	1/2" Air Dielectric Coax	11.7 dB	Times	LMR-400	.405" Foam Diel. Coax	15.2 dB
Andrew	LDF2-50	3/8" Foam Dielectric Coax	13.5 dB	Various	RG-213/214	.405" Poly Diel. Coax	47 dB
Andrew	FSJ4-50	1/2" Superflex Coax	15.2 dB	Various	RG-142	.195" PTFE Diel. Coax	62 dB
Andrew	FSJ2-50	3/8" Superflex Coax	15.6 dB	Various	RG-188	PTFE Diel. Mini-Coax	133 dB
Andrew	FSJ1-50	1/4" Superflex Coax	28.3 dB	Various	RG-174	Poly Diel. Mini Coax	185 dB
Times	LMR-600	.590" Foam Diel. Coax	10.4 dB				

TOP NATIONAL JAN. '96 ARRL VHF SS RUMOURED SCORES
by WZ1V

CALL	N2WK	K3MQH	K1RZ	WA8WZG	WA2TEO	W2HPF	W2SZ/2	AA2UK	WA3AXV	WZ1V	WA3NUF	KE8FD	KD1DU
GRID	FN03	FM19	FM19	EN81	FN31	FN13	FN22	FM29	FN20	FN31	FN20	EM89	FN31
CLASS	M/U	M/L	M/U	S	S	M/U	M/U	S	S	S	S	S	S
6	252/48	406/67	301/66	148/35	231/45	144/35	157/26	130/24	87/15	141/33	105/20	85/35	119/22
2	478/50	797/62	469/54	252/49	361/39	433/50	366/44	274/38	235/28	255/36	254/26	309/65	485/41
222	118/31	185/44	145/37	90/34	98/26	86/26	114/28	82/24	95/18	71/17	91/22	59/34	69/19
432	183/37	321/50	205/40	166/37	142/32	125/35	150/31	112/25	125/20	126/23	117/21	109/43	94/18
903	34/15		35/20	37/18	43/17	32/13	29/15	45/16	43/11	37/13	35/9	6/5	20/8
1296	40/15		48/19	65/24	49/17	34/12	28/15	61/16	63/10	45/12	52/13	16/11	27/9
2304	16/6		6/5	18/9	5/4	6/3	11/6	23/5	24/5	16/6	19/3		
3456	12/5		2/1	13/9		5/3	5/4	9/2	15/2		13/2		
5760	7/3			13/9		3/3	4/3	7/2	9/2		5/1		
10G	37/2		2/2	5/5					9/2		6/1		
24G	12/2												
LASER	18/2												
TOTAL	1207/216	1709/231	1213/244	807/231	929/180	868/179	864/172	743/152	705/113	691/140	697/118	584/193	814/117
Score	527,904	511,665	459,208	395,241	266,000	247,500	247,508	232,256	185,546	174,440	173,106	157,874	130,816

CALL	W0RSJ	WB2DNE	KP4XS	WB3JYO	N6RMJ	WB2YEH	KB2DMK	N1DPM	W3IP	K1TR	N2SB	WA2OMY	K1FO
GRID	FN20	FM19	EM84	FN20	DM14	FM29	FN12	FN32	FM19	FN42	FM29	FN20	FN31
CLASS	M/U	S	M/L	S	M/L	S	M/L	S	M/U	S	S	M/U	S
6	/	99/28	178/78	104/19	128/41	104/17	202/38	70/21	/	141/25	/	/	
2	/	242/44	225/54	217/23	212/40	187/21	329/37	150/26	/	247/28	/	/	158/25
222	/	51/22	39/26	68/18	107/34	86/13	73/23	58/18	/	74/19	/	/	76/19
432	/	119/35	66/42	96/19	123/35	101/14	104/29	86/22	/	109/20	/	/	310/35
903	/	13/10		35/9		43/10		29/13	/	20/9	/	/	
1296	/	26/12		49/8		53/10		32/12	/	5/2	/	/	34/10
2304	/			19/4		19/3		13/6	/	8/4	/		
3456	/			6/2		13/2		7/4		1/1	/		
5760											1/1	/	
10G													
TOTAL	?/?	550/151	508/200	594/102	570/150	606/90	708/127	446/122	604/119	609/111	?/?	?/?	578/89
Score	127K	126,387	122,600	120,870	120K	117,450	112,395	111,264	108K	106,400	103K	99K	94,874

Rovers	Score	Totals	Activated	Bands
ND3F/R	124,120	541/116	16 GRIDS	ABCD9E
KB3PW/R	55,000	??/??	5 GRIDS	ABCDEFGHI
NC7K/R	52,966	599/71	13 GRIDS	ABDL
N6NB/R	47,656	371/74	8 GRIDS	ABCDE
K9JK/R	32,076	367/54	6 GRIDS	ABCD9E

Mt. Airy VHF Radio Club (Pack Rats) score: 2.5 Million, 49 logs
North East Weak Signal Group club score: 1.7 Million, 36 logs

KENWOOD TS-450S & TS-690S LOW POWER MODIFICATION by N2LIV

The April 1994 meeting of the News Group and the (1994) 20th Proceedings of the Eastern VHF/UHF Conference of the Eastern VHF/UHF society addressed conversion of numerous low band rigs for use as low level drivers for higher frequency transverters. DUBUS 4/1992 presented a conversion for the TS-690 with the addition of a relay and switching circuit to maintain both high power and low power usage.

As Steve, N2CEI of Down East Microwave (DEM) searches for the "Ultimate IF", whether in frequency or quality of radios I offer two more conversions.

I am using a TS-690S to drive DEM 222 & 432 MHz transverters and a TS-450S to presently drive DEM 903 & 1296 MHz transverters and at a later date additional higher bands. My intent was to leave the radios in an "un-modified condition" to later restore to original use and appearances for sale. No need for full power output was currently required, only low level 28 MHz drive level.

Conversion was extremely simple. With the radio lying on its top and the front facing away from you, remove the bottom cover and the RF board is on the right. On the RF board, locate connector CN9 which is the output drive level to the final board. This connector is labeled and located approximately 3" below the CW filter in the center of the board. Disconnect the push-in grey cable, tape it over and secure it off on the side. Prepare a new cable (I used RG-174U) with mating connector. The push-in connectors are available from icon as part #93602689 CONN TMP P01XA1. This cable will be the new transmit output and the SO239 ANT connector remains the receive port. Route the new cable out through the back. Power to the final, filter and antenna tuner section was not removed and no extraneous noise has been noted.

An output of 18 dBm was measured on 28 MHz SSB on a whistle peak. This modification is simple and leaves the rigs unscared for future sal and offers a high quality receiver and transmitter for use with your transverters

Bruce Wood, N2LIV

4 ELEMENTS OVER 4 ELEMENTS FOR SIX

by Chris Fagas, WB2VVV

I have used a number of six meter antennas over the years, but my current one has a really nice set of trade-offs. It has free space gain similar to the 7 element 24 foot long boom model Ron, WZ1V presented in the last newsletter. Both antennas have free space gain of approximately 10 dBd (referenced to a dipole). However, the antenna I am currently using has a much wider and forgiving 51 degree (+/- 3 dB points) azimuth beam width, since these two shorter stacked yagis have only 12 foot long booms. This is because stacking horizontally polarized yagis, one atop the other, compresses the H-Plane radiation pattern into a narrower elevation pattern on the horizon without materially affecting E-Plane or azimuth beam width, when compared with the radiation pattern of a single similar yagi. On the other hand, doubling the boom length of a yagi compresses both its H-Plane and E-Plane radiation patterns. Mine are stacked only 11 feet apart, which is slightly over one half wavelength, and make a very compact antenna. The stacking distance was in fact not optimized for optimum gain, but for maximum null above and below the stack. This has the double benefit of being very quiet on receive since high angle noise pickup is minimized[1], as well as reducing the amount of transmitted energy below the stack which could potentially cause TVI/RFI. It should be noted that while optimum free space gain is somewhat compromised in this relatively close stacking distance, with stacking gain of only 2.46 dB (compared to a theoretical maxima of 3.0 dB[2]), the improvement in the typical Signal to Noise Ratio is very significant. This stacking distance was derived by modeling a number of possible positions of these antennas above the ground, and was modeled with the effect of the ground. The position of the upper yagi was of course a limiting factor, from a practical standpoint.

These two yagis are physically installed at 64 feet and 53 feet above the ground, and when computer modeled over ground place the maxima of their radiation pattern at 5 degrees above the horizon. The sky directly above the stack, extending down to an elevation angle of 50 degrees above the horizon in all directions, is attenuated by more than 35 dB when referenced to this maxima. This represents an eighty degree wide null cone which exists above and below[3] this stack. Modeled gain over ground is 17.88 dBi (referenced to a theoretical isotropic radiator), with Front to Back of 17.36 dB.

In operation, this antenna is very quiet and has good forward gain. It has a forgiving azimuth beam width allowing more stations to be worked without as much fiddling with the rotator. The wider azimuth beam width is also useful because the optimum beam heading for a band opening is often uncertain. This factor makes this a very good antenna to call CQ with. Its relatively modest Front to Back Ratio allows more stations to be worked off the back of the antenna in contests, and is by design[4].

Now for the best part, you don't need to locate or cut one piece of aluminum to make this antenna. These two yagis are simply slightly modified versions of the very sturdy and inexpensive Hygain HG-64DX. This model has beautiful boom to element clamps and uses all stainless steel hardware. It is a very well designed yagi from a mechanical standpoint, and again it is surprisingly inexpensive[5]. Electrically, it"s no slouch either, although I did take the liberty of changing a couple of dimensions to optimize performance a bit.

Simply build each of the two yagis as Hygain suggests in their instructions. There is plenty of extra boom length in the stock dimension schedule to add 1.75 inches to the spacing between the second and third directors, by repositioning the third (last) director 1.75 inches further out on the boom. The remaining boom overhang should be shared on both ends of the boom, so that the reflector does not enjoy any more overhang than the last director. Finally the reflector can be shortened by 4.0 inches overall, 2.0 inches on each half, to reduce the slightly excessive Front to Back Ratio while simultaneously increasing forward gain.

The recommended power divider, is a simple coaxial harness. A coaxial Tee fitting is used to join two 3/4 wavelength long sections of 75 ohm coaxial cable to the 50 ohm feedline which runs to your shack. Using odd multiples of quarter wavelengths of 75 ohm coaxial cable will transform the impedance of each of the two 50 ohm antennas to 100 ohms, at the other end of each of their respective transmission line transformers, and these two 100 ohm loads in parallel at the Tee fitting equal 50 ohms to match the feedline[6]. You will note that each yagi comes with its own 4:1 coaxial matching balun, and these are to be used in the normal fashion, and in addition to the "power divider" described in this paragraph.

Because energy travels slower through coaxial cable than it does through free space[7], an electrical quarter wavelength of coaxial cable will be shorter than a free space wave length. This difference is indicated by the Velocity Factor of the particular coaxial cable. The Velocity Factor is merely a decimal factor which shows the velocity of propagation through a medium with respect to the velocity of propagation through free space. The Velocity Factor of energy traveling in free space is 1.000, while the Velocity Factor of energy traveling in solid polyethylene dielectric coaxial cable is approximately 0.667. This means that in the amount of time that energy will travel a given distance in free space, it will only travel 0.667, or 66.7 percent, as far as it will travel in solid polyethylene dielectric coaxial cable. I recommend that you use solid polyethylene dielectric coaxial cable for the "power divider" since its velocity of propagation is very predictable and consistent from run to run, and it is relatively stable in an outdoor environment. It will also make the shortest physical length 3/4 wave transmission line transformer, since it is about the lossiest dielectric coaxial cable. Please do not worry about the loss, since it is insignificant on such a short length at such a low frequency. You should note though that Velocity Factor is a reliable gauge of the relative lossyness of a dielectric material, and can be used to grade coaxial cables of the

same diameter with respect to loss characteristics. Standard designations for 75 ohm solid polyethylene dielectric coaxial cables in increasing order of desirability are: RG-59, RG-11, and RG-216. RG-59 has a very small diameter of 0.250 inches, while the other two are larger in diameter at 0.415 and 0.432 inches, respectively. I happened to use RG-216 since it was available and it happens to be double shielded, which makes it stronger physically but offers little electrical advantage in this application. Of course the larger diameter coaxial cables will handle more power and are lower loss. From a power handling standpoint the 4:1 coaxial matching baluns which comes with the yagis is the limiting factor, but remember that each need only handle half of the power that makes it to the power divider. They are made of RG-58 coax but could be easily replaced with heavier coax such as RG-213. At 50 MHz RG-58 is rated to handle 300 watts of continuous power, which is roughly the same as 500 watts PEP SSB, with a typical duty cycle. This means that if you plan to exceed twice these amounts at the power divider, then you should upgrade the RG-58 to something heavier. I also used several large ferrite beads at the yagi ends of the transmission line transformers to reduce the likelihood of feeder radiation distorting the overall radiation pattern. The feedpoint of the HG-64DX yagis are made by stripping back the coaxial cable transformer feeders to make a short neat pig-tail "Y" with ring eyes soldered to each side, and installed across the driven element and the 4:1 transformer in the normal fashion.

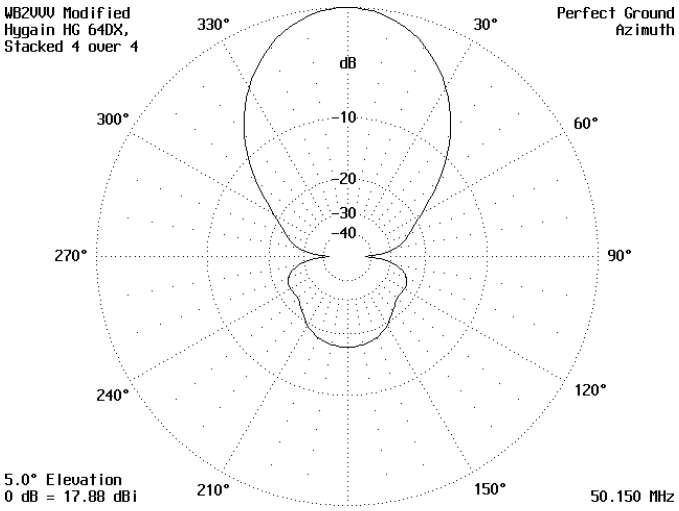
Using solid polyethylene dielectric coaxial cable each half of the "power divider" will be 9.815 feet, or 9 feet 9 and 3/4 inches long, measured from the center of the coaxial Tee fitting to the point where the transmission line transformer splits into a "Y"(and is no longer coaxial). The mathematical formula for this is as follows:

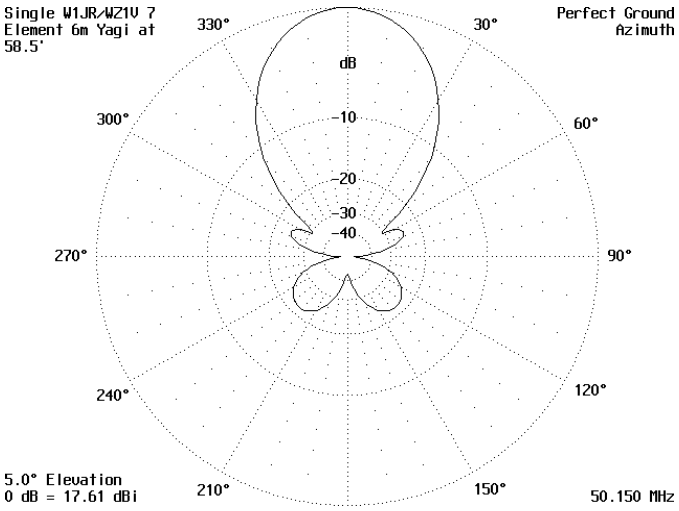
(Free Space Wavelength of 984 / 50.150 MHz) X (3/4 Wavelength) X (0.667 VF) = feet

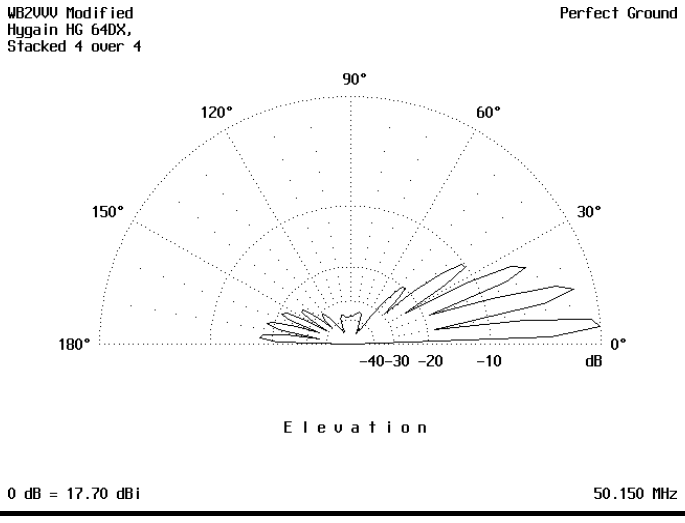
The methodology behind this simple 75 ohm coaxial cable "power divider" can be used on other bands, and even for many other applications as well.

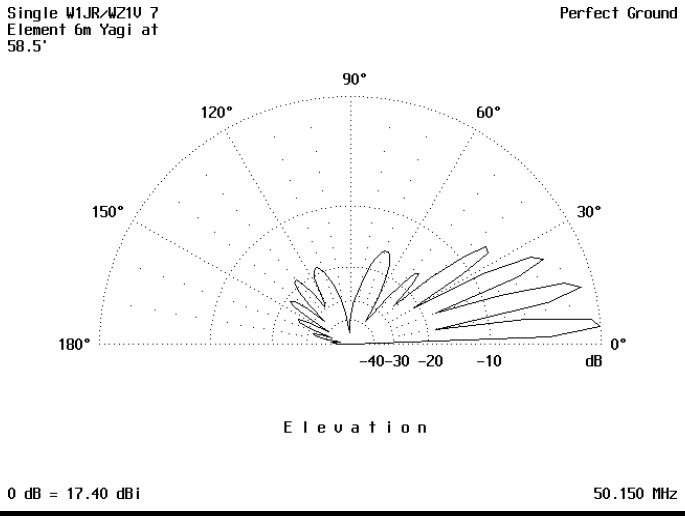
If you have the vertical space on your mast, you should always give serious thought to stacking yagis. Stacked yagis offer a very endearing set of trade-offs, which will not likely disappoint you.

References/Notes: 1. The VHF/UHF DX Book, Ian White, DIR Publishing Ltd. 2,3,6,7. Antennas, John D. Kraus, Second Edition, McGraw-Hill Book Company 4. The bulk of stations which I work are either to the Northeast or the Southwest, precisely 180 degrees apart which makes for a lot of rotating back and forth. 5. Approximately $105 each, discounted.









VHF PLUS WEEKLY CALENDAR

MONDAY:		
7PM TO ?	2 METER ACTIVITY NIGHT.....	144.200 USB
7:30	PACKRATS NET.....	50.150
7:30	NORTH EAST 10GHz OPERATORS INFORMAL ROUNDTABLE...	144.125
8:00	PACKRATS NET.....	144.150
8:30	PACKRATS NET.....	222.125
9:00	PACKRATS NET.....	432.110
9:00	VHF/UHF OPERATORS NET.....	3.843 MHz +-
9:30	PACKRATS NET.....	1296.100
10:00	PACKRATS NET.....	903.100
TUESDAY:		
8PM TO ?	222 MHz ACTIVITY NIGHT.....	222.100
9:30-11:30 PM	DX'ERS UNLIMITED CO2KK, Radio Havanna Cuba	6.0, 9.820 AM, 9.830 USB
WEDNESDAY:		
9PM TO ?	432 MHz ACTIVITY NIGHT.....432.100,	432.150
9PM	EASTERN VE'S 2 METER NET (VA3IKE) FN14,15.....	144.225
THURSDAY:		
10PM TO ?	1296 MHz ACTIVITY NIGHT.....	1296.100
FRIDAY:		
9PM TO ?	903 MHz ACTIVITY NIGHT.....	903.100
SATURDAY:		
8:30PM,10:30,12:30AM	DX'ERS UNLIMITED, CO2KK Radio Havanna	6.0, 9.820, 9.830
SUNDAY:		
10:30AM,	K2SMN's SUNDAY MORNING EAST COAST VHF SOCIETY NET	144.250 USB
9:00AM TO 2:00PM	432 AND ABOVE THEN 2 METER EME NETS.....	14.345 USB
9:00PM	S. NEW HAMPSHIRE AREA NET.....	222.210
9:00PM	K2RIW TECH NET.....	146.85 W2VL/R
10:00PM +or-	K2RIW 10GHZ TECH NET.....	146.85 W2VL/R

WANT MORE GRIDS; TRY IONOSCATTER
off the VHF reflector from Palle OZ1RH

IMHO ionoscatter is not meteor scatter. Ionoscatter is a propagation mechanism available 24H a day and was used by the US military in the later 50'ties for reliable communication in the artic (auroral Zone) and across the Atlantic (Gander-Soenderstroemfjord in Greenland- Iceland-England). This ionoscatter link was later replaced by a troposcatter link, in Greenland / DYE chain. Also the troposcatter link is not used any more.

Ionoscatter is similar to troposcatter, but caused by scattering of irregularities in the ionosphere at 85 km of height. This may give you a range of up to 2.000 km every day, if you can provide 500++ watts CW to a 12 dB antenna according to QST 1956(?). Ionoscatter seems to have diurnal variation of signal strength, best chances are at noon at path midpoint. During daytime the height of the scattering media is lower, perhaps 75-80 km, so range may be lower but with better signal strength (+10dB?) in the daytime. Path loss increase below some 1.200 km due to increasing scatter angle, so a path from 1.200-1.500 km is the easiest for ionoscatter.

I do not know if I have made any ionoscatter QSO's as there are few QRO stations in Europe on six. I am still looking for sked partners. People tell me they can hear my R-beep every time during a SSB MS sked. So it might work on CW. The info I have got from US stations is that 1500 w and a big beam will provide continous 51-53 signals at 1.200-1.500 km every morning. Has anyone done ionoscatter in the evening?

Ionoscatter weakens with the 5 power of the frequency (f^5) above 50 MHz, so do not count on ionoscatter for 144 MHz. There are some QSO's between big EME'er in Europe reported as ionoscatter, so it might not be impossible on 144??

Bailey and Kirby were famous writers, I have found their names all over the place in old papers. Here are some articles on ionoscatter I have studied with interest:

E. Fich and R. Ruddlesden, "The choice of aerial height for ionospheric scatter links", Proc. IEE, vol. 105, pt. B, suppl. 8, January 1958, p. 12-18 the whole volume is 200 pages of interesting stuff on tropo and ionoscatter

"Report of JTAC on Radio transmission by ionospheric and tropospheric scatter", Proc. IRE, January 1960

The scatter propagation Issue: Proc. of the IRE, October 1955, p. 1175-1298 ff.

R.G. Merrill, "Optimum Antenna Height for Ionospheric Scatter Communication", IRE Transactions on Communications Systems, March 1960, p. 14-19

R.G. Merrill, "Radiation Pattern in the Lower Ionosphere And Fresnel Zones for Elevated Antennas Over a Spherical Earth", National Bureau of Standards Monograph 38, 1962

I have found no later reference to ionoscatter, it seems no one but hams cares for ionoscatter today. If you know later discoveries on ionoscatter I would like to know, so I can take advantage of it for making QSO's.

73, Palle, OZ1RH. (OZ9EDR - OZ5W contest team)

FOR SALE OR SWAP

SSB ELECTRONICS LT70S TRANSVERTER.
28 MHz I.F. and 25 watts output. Looks and works fine. $280
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Ron Klimas WZ1V 458 Allentown Rd., Bristol CT 06010.

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Silver faced deluxe model 2 meter 20 watts $200
MICROWAVE MODULES TRANSVERTER MMT 50-28R
Silver faced deluxe model 50 MHz 20 watts $250
MICROWAVE MODULES TRANSVERTER MMT 144-28
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(thats right) 5w in 20 w out $250
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PACKRATS MICROWAVE ACTIVITY NIGHTS

In order to promote activity on the 903 MHz and above bands the Packrats plan to sponsor a microwave activity night beginning on Leap Day, February 29th and continuing on the fourth Thursday of each month. The theme for this activity is "Leap into the Microwaves". The rules are very basic, operate on any or all bands 903 and above from 8 to 10 PM local time. To assist coordination for those long haul contacts 144.260 MHz is suggested as a liaison frequency.

The Packrats have sponsored Monday night nets (50 - 1296) for many years. While the nets helps keep our members active and in touch they have not kept pace with the expansion of new active bands. Nets are also limiting in that beam pointing problems become unmanageable at higher frequencies and especially with any appreciable distance between stations. We have all lamented the lack of activity on the upper bands, except for contests the bands are dead. We also like your club have many new members just getting on the microwave bands for the first time. They need experience in lining up antennas, propagation, and just learning who's on the band. A microwave activity night seems to us the best way to generate interest for both new and experienced operators.
We would like to make this activity night a joint effort of all the Mid-Atlantic and New England VHF/UHF/SHF Radio Clubs. I am writing to the Chairmen and Presidents of all of the regional VHF clubs asking that they consider co-sponsoring and promoting this monthly activity night to their members,. I believe also that a joint undertaking such as this will help strengthen the camaraderie between our groups.

73, Phil Miguelez, WA3NUF, President, Mt. Airy VHF Radio Club

R.A.S.O.N. SPRING AUCTION MARCH 30, SENIOR CENTER RT 82 WATERFORD, CT

Bring or buy. Free admission but 10% on what you sell. Talk in: 146.97 pl156.7 Contact Mark, N1RSK at 572-9380

NEXT N.E.W.S. MEETING

THE NEXT MEETING IS ON MARCH 16, 1:00 PM AT THE QUALITY INN, VERNON, CT. THE GUEST SPEAKER WILL BE DAVE ROBINSON, WG3I PRESENTING "24 GHZ NARROWBAND"

North East Weak Signal Group

c/o KD1DU
Del Schier
126 Old West Mountain Road
Ridgefield, Connecticut 06877

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