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

CHEESE BITS

PACK RATS

W3CCX

CLUB MEMORIAL CALL

SCANNED TO PDF BY BERT, K3HUV, 2013

ARRL Affiliated Club

VOLUME XXXVIII November 1996 Number11

THE PREZ SEZ

Our thanks to Steve Kostro (N2CEI) the owner of Down East Microwave who gave a very informative presentation on DEM transverter boards at our October meeting. Steve described the various Hints and Kinks learned over the years along with a few inside story anecdotes. Everyone in attendance got a sneak peek at Steve's R&D efforts for new transverter products as well as a chance to meet Sandra, the real boss at DEM.

Since almost every tree in my neighborhood has conspired to simultaneously bury my lawn knee deep in leaves it can only mean that it's time to start seriously thinking about the upcoming January contest! Last year a majority of our members reported their best ever January contest scores. After witnessing the considerable exchange of antenna's, xverters and power amps that took place at the July White Elephant Sale plus listening to the successful hunting stories from several of our members as they made the annual flea market pilgrimage, I expect that the local competition this January is going to be a little intense. When every weekend you hear about new tower construction projects and new feedline projects and even (hold onto your hats) mast mounted preamps, well , you don't always need a weather vane to see which way the wind is blowing. Don't get left behind! Increasing your contest score doesn't happen by accident. Adding a new band is a sure way to build up your score. Sometimes all it takes is giving the equipment a thorough going over. Just because the rig hasn't died for the past 10 years doesn't mean it isn't out of tune or almost deaf. Increased activity or a band opening can help but not if you aren't prepared. Just how long do you think your 20 year old moldy coax will last?

Over the years I have learned that whenever I added something to the station my contest effort improved. Whenever I left things the way they were either my score or my place in the standings suffered. Maybe it's just psychological or maybe it's true that change is good but in either case the act of making a change, whether it was adding a new keyer, or a new band made me take a serious look at my station and my operating habits. I know the same method will work for you.

The November meeting will feature very our own Walt Bohlman, K3BPP. Walt has been designing antennas professionally for many, many years and has consented to share some of his extensive experience with us. Bring your questions about matching, phasing, stacking or whatever. Walt is the guy the big guns in the club go to whenever THEY have an antenna question. CU at the meeting and be sure to tell your friends.

73, Phil WA3NUF

MEETINGS

Third Thursday each month at 8:00 PM

Southampton Free Library

947 E. Street Road

Southampton, PA 18966

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PACKRAT 222 MHz REPEATER - W3CCX/R

222.98/224.58 MHz, Churchville, PA FN20LE

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	WA3AXV	Ron Whitsel (2 YRs)
	N3OZO	Don Schwartzkopf (1 YR)
	WB3KRW	Steve Dallas (1 YR)

MONDAY NIGHT NETS

TIME	FREQ.	NET CONTROL
7:30 PM	50.150 MHz	K3EOD
8:00 PM	144.150 MHz	AA2UK
8:30 PM	222.125 MHz	WB2YEH
8:30 PM	224.58R MHz	N3ITT
9:00 PM	432.110 MHz	WA3AXV
9:30 PM	1296.100 MHz	WA3NUF
10:00 PM	903.100 MHz	N3AOG

COMMITTEE CHAIRMEN

LADIES' NIGHT: N3AOG	215-443-9965
JUNE CONTEST: WA3AXV	215-355-5730
HAMARAMA: WB3JYO	609-538-1687
VHF CONFERENCE: KB3XG	610-584-2489

PACKRAT BEACONS - W3CCX/B FM29JW

432.298 MHz	903.071 MHz
1296.262 MHz	2304.034 MHz

Memorial to Thom Gooding

By Steve Ko0U/1

Word reached me late last Thursday night of the untimely death of Thom Gooding,ex-K4LHB and most recently, W8HBN. Thom, holding hands with his YLfriend, was crossing Rt. 611 in front of the Days Inn in Horsham,Pennsylvania when he was struck and instantly killed by a hit-and-rundriver, Friday night, October 4, 1996. Thom and his YL friend hadintended to attend the annual Pack Rats VHF Conference.

Thom was a mainstay of 220 MHz activity in the mid-Atlantic states for many years. He was the second "G" of G & G Electronics of Maryland,and lived for hamfests. Although he had not been very active recently on VHF due to a divorce, he was rebuilding and about to come back in abig way when he was killed. His funeral was held Tuesday, October 8, 1996.

My thanks to Sid Shusterman, K3SME, for passing on the sad news.

TID BITS

November Meeting Speaker: Walt Bohlman, K3BPP on Antenna Modelling.

Packrat Bill Olsom, W3HQT was awarded the **Wilson Award** at the 1996 Central States VHF Conference.

Dave Mascaro, WA3JUF, and Bob , WB2YEH, have just received their **Etra Class licenses.**

The Hamarama Vendor prize went to N2DFS and the Raffel prize went to N3XEM.

Dave Mascaro's **VHF Log program** is up to version 6.2 which now includes the capability of create files in the required format for submittal to the ARRL. Do yourself a favor and get a copy and use it in January. Among it's many features is a reminder to you of the other bands the station has that you just worked that you havn't worked yet. Logging will be easier, the dreaded dupe sheet will never be forgotten and you can have even more fun.

The Packrat 222 FM net on Monday night continues with Bob, W3GXB as net control. The 2M SSB net alternates with Bill, AA2UK, and Al, N3ITT sharing the load.

The November issue of CQ VHF has the second part of a two part article on EME Techniques by Eric, NI6G.

The **Tidewater Area 2 Meter Net** meets on Monday evenings at 2100 local time on 144.230 MHz. Net control is usually AD4NJ or WB4GCS or someone near Tidewater Va.

Membership News

Voted to membership at the October meeting: NK8Q, Mark J. Schreiner, 662 Cafferty Rd. Ottsville Pa. 18942, 1-610-847-2285who works 50, 144, 432, thru 1296. Mark is also into photography & bicycling.

Also, N3NID, Hank Hamarman, 1430 North Gravel Pike, Perkiomenville Pa 18074, 1-610-287-4891. Hank is on 50, 144 and HF. He is married with two children also interested in photography and electric cars.

Applications were received and read at the meeting from Rick, KB3PD, and Russ, K2TXB.

We are sorry to report the death of the mother of Chuck Steer, WA3IAC, and the father of Joe Landis, AA3GN.

CHEESEBITS SUBSCRIPTIONS

Cheesebits subscriptions are available to everyone interested in activities and information from the VHF thorough the microwave frequencies. Subscriptions are for 1 year of 12 issues. For a subscription, send the following information:

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November 1996

Send to: SUBSCRIPTION/ADVERTISING MANAGER:
Bob Fischer, WB2YEH
7258 Walnut Avenue
Pennsauken, NJ 08110

Calendar of Coming Events - November 1996

2-4 **ARRL Novcmber CW Sweepstakes**. See Oct. QST, page 111 for rules.

4 Predicted peak of the **Taurids meteor shower** at 1915 UTC.

4 Check into the 6 Meter Net on 50.150 MHz at 7:30 PM EST.

4 Check into the 903 MHz Net on 903.100 MHz at 10:00 PM EST.

5 **Election Day**

9 Central Pennsylvania Repeater Assn. **Hershey Hamfest** at the Hershey Armory, 28th Infantry off 422 on Baum Ave., Hershey, PA. TI on 145.47(-) and 145.29(-). VE Testing.

11 **Veterans Day**

11 Check into the 2 Meter Net on 144.150 MHz at 8:00 PM EST.

11 Check into the 1296 MHz Net on 1296.100 MHz at 10:00 PM EST.

14 **Packrat board of directors** meeting at the QTH of Richard. N3AOG. Call 215-443-9965 for directions. All interested parties invited.

16-18 **ARRL November Phone Sweepstakes.** See Oct. QST, page 111 for rules.

17 Predicted peak of the **Leonids meteor shower** at 0442 UTC.

18 Check into the 220 MHz Net on 222.125 MHz or 224.58/R at 8:30 PM EST.

21 **Regular meeting** of the Mt. Airy VHF Radio Club at the Southampton Free Library on Street Rd. in Southampton, Pa. The scheduled speaker will be Walt, K3BPP, on Antenna Modelling. All VHFers are encouraged to come and enjoy the evening with us. You need not be a member. Do you need to attend this meeting to qualify for club contest minimum attendance? Come anyway and bring a friend.

23-24 **CQ World-Wide DX Contest - CW**. See Nov. CQ, page 93 for rules.

23-24 **ARRL International EME Competition - 2nd weekend**. See Sept. QST page 116 for the rules.

25 Check into the 432 MHz Net on 432.110 MHz at 9:00 PM EST.

25 Check into the 903 MHz Net on 903.100 MHz at 10:00 PM EST.

28 **Thanksgiving**

28 **LEAP INTO THE MICROWAVES with the Packrats!** 903 and above. Starting on the 4th Thursday of the month and continuing every 4th Thursday of the month operate from 8 to 10 PM local time on any band 903 MHz and above. For coordination on those difficult long haul contacts 144.260 MHz is the suggested liaison frequency. So here's your chance to fix what broke in the contest and work all those stations you missed.

HAMARAMA HELPERS

By: Phil WA3NUF

There sure were a lot of Packrats working at Hamarama! This years event was the smoothest running ever thanks to the many club members who helped the parking, ticket sales, and club tent crews. The list compiled as of Sunday afternoon includes: W3GXB, K3MFI, W2SK, WB2YEH, W3KKN, N3OZO, K3IUV, WA2OMY, WB8ZAR, KB3IB, N3EXA, WA3IAC, WA3EHD, WB2VLA, WA3JUF, WB3JYO, WA3AXV, WA1YHO, K3PHY, AA3GN, KU3A, K3EOD, N3ITT, W3IIT, WA3NUF, WA3YUE, N3AOC, W3GAD, N3GSA, WB3KRW, KB3XG, N3NGE, K3EBZ, N2DEQ, WA3RLT, W3OR. WOW!!! Hope I didn't miss anyone. Thanks to everyone who gave some of their time to the club.

Casual VHF/UHF Contesting made easier

By Dave mascaro, WA3JUF

Whether it be the June QSO Party or one of the Spring Sprints, VHF and UHF operators are always urged to at least get on the bands and give out points. It is important to show the FCC and the League that these non-HF bands are being used. Too many times however, the thought of logging a contest and turning in a LOG discourages Amateurs from partiscipating.

There is no longer a reason not to turn a LOG to the League. My VHF and up contest logging software, VHF_LOG, will write an ASCII log file (and summary) that can be E-mailed to the ARRL Contest committee. Send your paperless and postage free LOG to contest@arrl.log.

Your LOG can also be submitted by anonymous FTP or to their telephone BBS, in addition to the floppy disk or paper through the US Mail. Read the contest rules for more info or check the ARRL WEB site at http://www.arrl.org.

VHF+ NEWS & ACTIVITY

By Jerome Byrd, K3GNC

"VHF+ meets the SUPREMES"

LET MY LOOPERS BE WHY DON'T YOU BIRDS. GET OFF MY LOOPERS WHY DON'T YOU BIRDS.

I REALLY DON'T WANT YOU, BUT YOU KEEP ON HANGING ON.

Chorus: WHY DO YOU KEEP HANGING AROUND AND TEARING THE LOOPS APART. WHY DON'T YOU GET OUT OF MY LIFE AND LET ME TURN THEM OVER AND MAKE A BRAND NEW START.AND THEIR AIN'T NOTHING THE SPCA CAN DO ABOUT IT...OH OH OH.OOOOH

LET MY LOOPER BE WHY DON'T YOU BIRDS. GET OFF MY LOOPERS WHY DON'T YOU BIRDS.

I REALLY DON'T WANT YOU, BUT YOU KEEP ON HANGING ON.

ON THE BANDS: My computer hard-drive died and I lost EVERYTHING RELATED TO HAM RADIO THAT I HAVE ACCUMULATED SINCE JANUARY, 1994! (OH GOD!!!) The following is from memory:

October has produced some decent tropo, mostly of the coastal variety. Therewas a mild Aurora the week of 10/21?? Six meters opened unexepctedly several times.

With stations like AA2UK, WA3AXV, WB2JHG, WA2LTM, WA8WZG, KA1OTP, VE3BQN, W3IP, K2TXB, W3VIR, N3NGE, N3EXA, W4VHH, W2DRZ, W4VHF, PACKRAT NETS (WA3NUF, N3AOG), and others leading the way, Microwave (903..up) activity is HOT!!

There is more regular activity on 1296 nightly then 50MHz, 222MHz, and often 432 MHz.

'REPORTED' VHF+ ACTIVITY:

DATE	CALL	GRID	FREQ. (MHz)	MODE	REPORTED BY
10/02/96	AF1T	FN43	903	CW	K3GNC (FM29)
10/07/96	W4VHH	EM95	432	CW	K3GNC
"	N4MWS	EM93	144	SSB	K3GNC
"	N4PHH	EM95	144	SSB	K3GNC
"	EVERYONE	EM93,4,5	144	SSB	AA2UK (FM29)
10/08/96	K1WHS	FN43	2304	SSB	WB2JHG (FM29)
"	K1WHS	FN43	903	SSB	K3GNC
10/16/96	W8HAX	FM09	144	SSB	W3OR (FM28)
"	K4KAE	FM02	432	SSB	W3OR
"	K4KAE	FM02	432	SSB	AA2UK
10/22/96	N8RAH	EM89	144	SSB	W3OR
10/27/96	2 - VE2'S	FN35	50	SSB	N3EXA (FN20)

WHERE OH WHERE IS CARMEN SANDIEGO?

STRONG, LOG LASTING AURORA, K3MLD (FN10), N8PEK (EM98), NEW ENGLAND COASTAL BEACONS

LET LOOSE THE DOGS OF WAR:

SEE SEPARATE ARTICLE - "JANUARY 97 TOP 25 - SCOUTING REPORT"

CU ON THE BANDS, JEROME - K3GNC EMAIL: JBYRDK3GNC@worldnet.att.net , PHONE: (215) 226-1418.

QRZ CONTEST

By Al, N3ITT, January Contest Coordinator

Yes! It's that most wonderful time of the year again. Now with Hamarama and the technical conference behind us, it's time to bring our focus on preparing for the January contest.

So far, I'm happy to say things eeem to be shaping up for another year for the Pack Rats. Membership is up and activity on the bands seems to bo on the rise. Many members have been hard at work oll year to improve their stations, some with impressive results.

Today, I received the latest update on elgible members from Walt, WA3AQA. We have 58 members who can compete this year, so we do have a shot at the Unlimited category. Please make every effort to get in the contest and submit a log.

By now, you should have received my personal mailing list with team lists and questionaire - PLEASE, if you have not done so, fill it out and get it back to me - this information is important in making up activity lists, logging program database and contest packages. I also need to know who is using computer logging (I recommend WA3JUF"s logging program - it's so simple even a computer illerate like myself can use it and it does take the hassle out of logging!). Most importantly, I need to know what kind of help you need and what you can supply to make up the "help" list, to appear in the December Cheese Bits.

Remember, the December meeting will be the contest strategy meeting. Contest packages will be handed out, followed by a lively discussion on various contest techniques. Please try to attend and if possible bring a friend. Improving the skill of other local operators only can help our score and maybe we will find a new Packrat!

OK, that's about it for now. Remember to look for next month's update and the help list - until then, 73 and CU on the bands.

K3GNC'S JANUARY VHF 97 TOP TWENTY-FIVE

RANK	CALL	SCOUTING REPORT
1	WA8WZG	No weaknesses, No mercy.
2	WA2TEO	Bigger - Higher Antennas, Improved 903..up
3	AA2UK	Good News - New 100 Foot Tower, Bad News - Zoning Problems
4	K1RZ	Solid Blocking, Solid Tackling, Solid Execution
5	WA3AXV	Bone Crushing last year without 6 meter beam. One is coming!
6	WZ1V	Will be showing a new Offensive Line on 2, 222 and 432.
7	W3OR	Coming out of Semi-Retirement with a 3 Tower Run & Shoot
8	WA3NUF	Seasoned Veteran, knows how to win. May surprise.
9	WC2K	Could Challenge the top Stations, or finish down the list.
10	KE8FD	Front Line Bands as Strong as ANYONE. Secondary Weak.
11	KD1DU	Constantly improving since move to new stadium.
12	WOUC	Powerful Squad, but plays in a small outdoor stadium.
13	KM1H	Has the talent to place higher, but desire?
14	WB3JYO	Powerful and Deep, must play hard for 4 quarters.
15	WB2DNE	Hard-nose and talented, but not enough personnel(Bands).
16	WB2YEH	Small Line-up, but very deep in personnel.
17	N1DPM	Not as powerful as others, but deep in personnel.
18	N2SB	Plenty of talent, needs new Offensive Coordinator.
19	WB2JHG	Surprise of last season, good draft, could finish higher.
20	N3EXA	Good Defense, must have a good completion percentage.
21	K1TR	Plays a real tough schedule, but is always in the game.
22	K2UOP/8	If injuries don't slow him, could finish higher.
23	VE3KDH	Powerful Starting Line-up. Weather will be a key factor.
24	WB3KRW	Alot of rookies, but could surprise.
25	W1GCI	Has to improve on last year to hold this spot.

NOTE: W2HPF, KA2RDO, NJ2L, N2WK, KD5RO WOULD NORMALLY BE INCLUDED ON THE'TOP TWENTY-FIVE', BUT MUST DECLARE THEIR PARTICIPATION IN THE 'SINGLE-OP' CATEGORY.

IF YOU WISH TO BE CONSIDERED FOR THE ABOVE LIST, OR THINK YOU SHOULD BE RATED HIGHER/LOWER - SEND A DESCRIPTION OF YOUR EQUIPMENT AND CONTEST PLANS TO: JEROME BYRD - K3GNC, 1530 Locust Street, #31, Philadelphia, Pa 19102, (215) 226-1418, EMAIL:JBYRDK3GNC@worldnet.att.net

QST de W1AW ARRL Bulletin 75 ARLB075 From ARRL Headquarters Newington CT October 29, 1996

The ARRL Board of Directors met in special session October 24 and 26, 1996, at Windsor Locks, Connecticut. The following is a summaryof major Board actions.

The League will seek an extension of the compliance date, currently set for January 1, 1997, of new RF safety regulations released in ET Docket 93-62, to January 1, 1998, allowing more time for drafting of acceptable implementation guidelines.

Responding to the continuing problem of minimal FCC enforcement activity, the ARRL will petition the FCC to create procedures to allow submission of private sector complaints of serious rule violations directly to the FCC's Chief Administrative Law Judge, hurdling bureau processing delays.

ARRL President Rodney Stafford, KB6ZV, was authorized to sign a formal agreement with the National Frequency Coordinators' Council, effecting the so-called single point of contact concept.

The ARRL will petition the FCC for a relaxation of the rules governing the Radio Amateur Civil Emergency Service to permit stations operating under RACES to communicate with non-RACES amateur stations actively engaged in an emergency or drill. An increase in the time limit on RACES drills to five hours per week will also be sought.

In view of the congressional mandate imposed on the FCC to auction the 2305-2320 MHz band for commercial purposes, ARRL will seek an increase in the amateur service allocation status, from secondary to primary, in the 2300-2305 MHz segment.

The Board adopted revised legislative positions for the 105th Congress.

The Board's WRC-99 planning committee will study an ARRL Industry Advisory Council recommendation to extend HF digital privileges to Novice and Technician Plus licensees and report back to the Board.

Effective July 1, 1997, ARRL dues of Full and Associate Members will increase to 34 dollars annually. The senior dues rate will be increased to 28 dollars.

The Board declared the theme of the 1997 ARRL National Convention in Jacksonville, Florida, to be Public Service. The Board also declared 1997 as the ARRL Year of Public Service, in recognition of the critical importance of public service activities in the amateur community.

The Board commended retiring West Gulf Division Director Tom Comstock, N5TC, for his long-time dedication and service to the ARRL.

Details will appear in January QST.

Antenna Height and Forward Scatter

From the VHF Reflector

Editors Note: The info provided here is an example of the discussions that occur in the VHF Reflector. They are a little like a group discussion and rely on the reader to follow the "thread". Simetimes you don't get all of the messages and it can seem a little disjointed but there are gems of discussion here to learn from. Hopefully the 'snips' here are not too disjointed and you will learn a little from the discussion. Each 'author' is highlighted here before their input to the discussion.

de John Godwin, KB5IUA. Looks like there are several misconceptions about what can be done in regards to tropo scatter or what I sometimes refer to as forward scatter.

First off do not be confused in thinking that forward scatter is the same beast as meteor scatter. While a good setup for forward scatter can be used as a meteor scatter station and quite effectively the modes of propagation are decidedly different.

To be really effective the correct vertical take off angle must be used no matter which mode of propagation. For meteor scatter a system can be designed for a particular distance and the success ratio to that distance will be phenomenal (as long as it is kept within reason). Depending on the size and speed of the meteor the ionization will normally occur from about 90 to 120 kilometers high (the major showers average ionization varies).

For forward scatter the scattering of RF occurs in the lower troposphere. The vast majority of the signal is scattered at heights of less than about 6 miles (from ground level to about 6 miles). Any higher and there is just not enough stuff to scatter very much RF.

At 144 MHz if you desire a system that is optimized for a single hop distance of 400 miles and the bending or refracting layer is 10 kilometers high (which does not happen with forward scatter) then the antenna will need to be about 300 feet high and the main lobe for the vertical take off angle will be about 0.3 degrees.

For almost all of us this is not practical or even desired. The main point is again to keep the vertical take off angle as low as possible, and antenna height above average terrain helps accomplish that.

As for practical applications; at my station I have two antenna systems for 144 MHz weak signal work. All antennas are 2M5WL M2 antennas. For terrestrial work there are a pair of them stacked on top of a ninety foot tower and for EME I use four of them in an H array with the cross boom about 25 feet above ground. From my experience with them in regards to terrestrial forms of propagation, the 2 at 90 feet outplay the 4 at 25 feet. In fact it is no comparison. I work folks with the tall antennas that I cannot even hear with the 4 bay array (BTW the 4 antennas work nicely on EME). With the tall antennas the everday effective range is from 250 to 350 miles to the average station.

Antenna Height and Forward Scatter contd.

Finally do not be led to believe that at the microwave frequencies you cannot work over 100 miles unless there is some form of enhancement. NOT SO. I consistently work stations out to 200 miles (no enhancement necessary) and more on 1.2 GHz with neither station running more than 4 loop yagis or 100 watts.

BTW my station is in EL29CD. Flat ground and no hills for over a 100 miles in any direction.

de Robert Carpenter , Subject: Re: Antenna ht. for tropo. One of the common predictors for troposcatter signal strength is related to the angle made where the beams from two stations intersect - or even where the horizons from the two stations intersect. Probably increase Earth's radius as one always does for tropo.

If the intersection angle is small, the two stations just outside line of sight range. As the stations get farther apart, or their horizons are elevated by nearby hills, the intertsection angle becomes greater and the sigs get weaker.

You should read "Beyond Line of Sight", edited by W3EP and available from the ARRL. Unfortunately the troposcatter articles are contained in the "The Other Scatter Modes" section.

de Wayne Hoffman, WB6WLR, Re: Antenna ht. for tropo. At 02:39 10/31/96 UTC, you wrote:

>But, just try to go to the WEST from here! Starting at 50 to 100 miles, we have a horrendous set of hills-called the Appalachians.
>Many of these hills are 4,000 feet or higher. Rounding, we come up with 5,000 feet obstructions at 100 miles, which is 1 mile per
>every 100 miles. In terms or actual degrees of obstruction, this is INSURMOUNTABLE for long haul. Of course we can work
>stations through this-but the long haul stuff which comes thru at low angles is going to be few and far between!

Well, according to this, those of us unlucky enough to reside in the LA basin shouldn't be able to make those regular 400+ mile contacts. We're SURROUNDED (except to the west, of course) by mountains, many more than 10,000 feet in height, and a heckuvalot closer than 100 miles!!!. From a personal point of view, my best path for MS is N/S, right over the top of the highest peaks.

I believe a better measure is the elevation angle the obstruction presents. Don't know where, but I remember hearing (reading??) that obstructions up to about 10 degrees don't present much of an obstacle at VHF/UHF freqs. This matches my own observations...

de Carl, KM1H, Re: Antenna ht. for tropo. I doubt if anyone has all the answers to this one.

My own experience from FN42 in NH says the higher the better. I'm on a 550' hill with a 100' tower for 2M and above. The elevation is not tall by many standards but I am line of sight to Boston, over 30 miles away and can even see most of the airport tower. Aiming directly at Boston would get me nowhere except seawater in the South Atlantic but I want to establish a reference.

My shot down the East Coast to Florida, etc takes me over the complete height of Massachusetts plus Rhode Island before I hit water; thats well over 100 miles so I don't consider myself a coastal QTH.

I have been fortunate enough to have experienced many of those Florida type tropo openings over the past 5 years or so from this QTH. I have noticed that on many occassions that stations in my close proximity but at lower ASL elevations were working tropo with better results than myself. But after really listening it became obvious that their distance to the "DX" was substantially shorter than my QSO's. They were working 400-500 miles with tremendous signal reports but I was working 700-1300 miles and the 400-500 mile stations were substantially attenuated. This phenomon has repeated many times. I can partially attribute it to my QTH where the coastal weather fronts come inland at Boston and sometimes turn up my way and sometimes seemingly stop overhead...I am at least 100' above any other hill within 20+ miles in most directions. Mother Nature and the Ice Age.

I also hold the USA land tropo record on 432 as a result of crazy condx and just being there at the right time back in 12/92. 1373 miles (real US miles, not QST km crap) to EL94 with 30W from me (no preamp and just a tired IC451A for a driver to a sick TE 100W amp!) and 20W from Rene, WB4MJE. Being a newcomer to the band (about 2 weeks) I had no clue as to the accomplishment until I received a phone call from WB5LUA asking for details I worked 6 Florida grids that night on 432 plus over 4 almost nonstop hours on 2M. That evening even CT and NJ stations didnt hear or work a fraction of what I did even on 2M. Stations 25 miles North or East of me heard or worked virtually nothing. After the fact it became evident that the tropo duct virtually stalled overhead or was low enough ASL that it hit my hill and stopped!

I have seen similar results time and again. Low antennas or low ASL consistently beat me on close in stuff. High antennas and/or serious ASL can really kick some serious butt without megawatts ERP for long haul.

Now comes the "gotcha". On East-West paths it always seems that "height rules". But in that direction I have to contend with 3000' plus mountains from 50 to 100 miles away so I have a starting advantage compared to many locals. My E-W tropo QSO's nothing spectacular either...800-1000 miles or so max. I've done better on Aurora and Eskip.

de Ken KP4XS, Subject: Scatter antenna heights. I have to disagree about the near hills/mountains having a devastating effect on Scatter signals. The Great Smoky mountains begin to my West at a distance of about 40-50 miles or so. My elevation is 747 feet ASL and my 2m antennas are 35 feet high above ground. I have not seen any negative effects of those mountains whatsoever other than some wild Multipathing that sometimes allows me to hear distinct doubling on signals to my EAST! I have had very good luck with Ms work in all directions.

Antenna Height and Forward Scatter contd.

My furthest contacts via Ms have actually been in directions where the mountains are most visible. These mountains range from 2000-5000 feet or so in height. The lack of success for Ms work towards certain directions can be more attributed to the geometry and chance of Hotspots occurring in that particular direction. NW/SW/NE/SE are the best bets. Due West,Due South,Due North offer less prospects. (at least from my QTH)

Now if those mountains are within 5-10 miles from your QTH this may pose a severe problem! Just being up high isn't the solution. The trick is to be out in the open with little obstructions in the important directions. Rolling hills nearby that are higher than you antennas,lots of trees, Skyscrapers, etc. will nickel and dime your signal to death. The more open sky you can see for long distances, the better. The Bluer,the better!

de Ken KP4XS, Re: Antenna ht. for tropo.

Excellent point! I never really considered that by increasing the height of the antennas you risk increasing your Noise capture area from surrounding noise sources. I have seen this often on 10 meters where a 200 foot high 10m antenna has been rendered useless by a distant electrical noise source while an antenna 60 feet high hears none of it. I have been thinking about going for the theoretical 6db gound gain by doubling my 2m antenna height from 30 to 60 feet. I'll have to take into consideration the possibility of xdb increase in noise.

>height. State of the art receivers are very sensitive. Since the noise >sources are seldom anywhere you have control over, i.e. under the antenna, going up higher probably won't help.

de Doug, W2CRS, Re: Antenna ht. for tropo. Brother Art B. Allen wrote:

>This is a much misunderstood concept and there is no easy answer.

>First, forget 100 miles-that's FM range on VHF, unless there is a big hill, you can probably work almost anyone within 100 miles >using ssb/cw on just about any bands (microwaves excepted, of course). Also, tropo and MS arrive at similar angles (atleast for >long haul).

>The first hurdle is ground clutter. Local trees, small little hills (mounds) and surface irregularities. If we live on a mountain top >and have no trees, then our antennas only need to be 10 feet or so off the ground (enuff to minimize ground interactions). Most of >us aren't in this situation.

>If you have a line of ridges around your QTH (or out to say 20 miles), the ideal situation would be to use the tower height so as to >OVERCOME those obstacles. If you have a 100 foot ridge that's 5 miles away, you should have a atleast a 100 foot tower.

>If you really want to do long haul stuff, your radio horizon becomes much more critical-but the actual height of the antenna has >little impact on the radio horizon for more distant obstructions. If you have a 1000 foot obstruction at 20 miles, then an extra 20 or >50 feet of tower height will not make any difference. Long haul stuff means low angle signals-and you need the best radio horizon >available for this.

>If we look at a more practical example (mine for instance), we can see some pretty hard evidence to support this.
>I live in Eastern Maine, in what some might call the 'coastal plain'. When I go to the SW, towards CT, NJ etc, we have a relatively >clear shot. MS from GA and FLA comes right in! Its a fairly clear shot for 100 miles.

>But, just try to go to the WEST from here! Starting at 50 to 100 miles, we have a horrendous set of hills-called the Appalachians. >Many of these hills are 4000 feet or higher. Rounding, we come up with 5000 feet obstructions at 100 miles, which is 1 mile per every 100 miles. In terms or actual degrees of obstruction, this is INSURMOUNTABLE for long haul.

>Of course we can work stations through this-but the long haul stuff which comes thru at low angles is going to be few and far >between!

>Would I expect to have alit of success running with an IOWA or SD station on MS? Not much chance-its a long shot! In this >situation, living on a hill and having a 200 foot tower just isn't going to make a whole lot of difference.

My esperience operating >meteor scatter from southern Maine as K1UGQ from 1964 until 1977 is different. I had no problem working SD, ND, or NE. Moutains 4000' to 6000' at 100 miles are below the visual and radio horizon and don't effect meteor scatter propagation. Also, a 100' ridge at 5 miles would have virtually no effect as it increases the visual horizon by less than a degree compared to flat lan (someone check my geometry). The real question is do 5000' mountains at 100 miles or a 100' ridge have any effect on tropo scatter (no in my opinion) or tropo enhancement (sometimes in my opinion). From southern Maine, I could work a few big guns in Ottawa, Buffalo, and Toronto any time, K8UI in NE Ohio occasionally, and much further west from time to time. Of course, K1WHS, running 6 dB more than I did, does much better.

de Robert WB4AXQ, Subject: Re: Antenna ht. for tropo

Check out the RSGB "Microwave Handbook", vol.1, chp.3. The focus is on troposcatter links. In general, the path loss between two points increases by about 10db for every degree of horizon angle at each end. This implies that the clearance of obstructions is

Antenna Height and Forward Scatter contd.

imperative (you want a clear take off down to 0 degree elevation, or below). If you have a relatively small blockage a few (or several) km away from you in the direction you want to work, the higher tower may noticeably impact the link, otherwise, go with the bigger antennas at the lower height (remember to include the tree height when considering hills out in front of you). Also consider the narrow beamwidth the larger antenna implies, this may lead to more headaches than you anticipated (if the antenna really is big).

de Del, KD1DU, Subject: Re: Antenna ht. for tropo. In a message dated 96-10-31 10:55:16 EST, you write:

< good performance is indeed possible from low heights if surrounding obstructions can be cleared. Maybe it's worth the extra 75 <feet to clear a nearby hill or trees, but given the same array at 75 or 150 feet in the clear, my gut feeling is that the performance <would be about equal on most long haul paths. This assumes that the line loss is insignificant (your assumption). I say, go for the <monster antenna at 75 feet. On two meters, the limiting factor in station performance is usually local noise sources, not the <antenna, receiver, coax, etc. To this end, maybe more attention should be given to antenna pattern than to height. State of the art <receivers are very sensitive. Since the noise sources are seldom anywhere you have control over, i.e. under the antenna, going up <higher probably won't help.

<A N Thompson wrote: How great an effect does antennas height have > on the performance of an antenna array when > used for <long distance (400 <mi.+) tropo scatter?

I have recently puzzled over this subject. At my old QTH I moved a 2 meter antenna higher but still in the trees and saw a tremendous improvement. At my new mountaintop QTH I moved 5 bands from a temporary 30' AGL location to 80' taking them completely out of the trees. I saw perhaps a 20 dB improvement on 2 and perhaps 30 to 40 dB on 1296.

I expected getting out of the trees would make a big difference but what I am curious about is ground reflections. Dick, K2RIW is of the opinion that just getting out of the trees is not enough, but rather the higher the better. I recently was using the K6STI TA, terrain anylizer software to look at what would happen if I changed the 30 height of my 6 meter antenna, while I was at it I looked at 2 meters. What I found was very interesting.

I am assuming the software can model VHF signals. The type of soil did not have much of an effect and it does not model the absorptive blanket of trees covering the terrain here in New England. What I found was that at 80' AGL the signal is 15 to 25 dB down on the horizon with the main lobe tilted 6 or 7 degrees up. Even at 500 or 1000' AGL there was still a significant up tilt on the pattern although less. I have elevation rotation on my 2 meter array and have never notice an improvment on any signal LOS, tropo or AU that elevating the antennas would make an improvment. I the software is correct If my antennas were able to be down tilted I would see an improvement of perhaps 20 dB on at least LOS paths. I know that some EME arrays are set up to down tilt to make Earth noise measurments and I wonder if anyone has observed a improvement on LOS contacts. I see a great deal of neigborhood EMI on the horizon and I am sure that a higher antenna would see less.

It is my opinion that the higher the better even after you get above the trees and nearby hills.

Looking forward to the comments.

de Bill Frost, Subject: Re: Antenna ht. for tropo. KD1DU@aol.com wrote:

> I expected getting out of the trees would make a big difference but what I > am curious about is ground reflections. Dick, K2RIW >is of the opinion that > just getting out of the trees is not enough, but rather the higher the > better. I recently was using the K6STI >TA, terrain anylizer software

>Del:
I think programs that analyze propagation and antennas are great for "what if" scenarios, but as you are finding, things often slip through the cracks in the model that are significant in the real world. The surface of the earth below the path does indeed make a significant difference, perhaps in ways that the model ignores. As an expample, some years ago, WGN-TV in Chicago moved it's antennas from the top of the Prudential Building to the top of the Hancock Building, many hundreds of feet higher. Both buildings are essentially located on the shore of Lake Michigan. After the move, reports came in from viewers in Michigan saying that they were now unable to receive a good picture. The old antenna was in the "duct" over the lake, the new one, while in a "superior" location, was out of it. Go figure. I think you are correct is suspecting that antennas over trees are different than those over water or sand.

As for antenna height, there reaches a point of diminishing returns over a height of say, five wavelenghs, insofar as the antenna pattern is concerned. Sure, this might not be true over a plate-metal earth, but sometimes a good rule of thumb is better than a five minute computer simulation. Dirt really does soak up RF pretty well, as do trees. As the earth's curvature drops away from your antenna's shot, the effect becomes less and less. Those nice fuzzy trees might be doing your antenna pattern a favor by attenuating the reflected clutter even more than your program might indicate.

BTW, I've had similar experiences switching from a tilted antenna to a horizontal one on various paths...no improvement. These were satellite antennas, not a moonbounce array.

The agregate knowledge on this reflector is probably a better resource that most computer simulations.

If only it would print out a polar plot....

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