

PACK RATS'



PACK RATS

CLUB CALL: W3CCX

MT. AIRY VHF RADIO CLUB, INC.

CHEESE BITS



MT. AIRY VHF RADIO CLUB, "THE PACK RATS", PHILADELPHIA, PA. W3CCX
NET FREQUENCIES: 50.150, 144.150, 222.125, 224.58/222.98, 432.110, 903.100, 1296.100 MHz
AFFILIATED CLUB: AMERICAN RADIO RELAY LEAGUE ARNS

Meetings: Third Thursday of each month at 8:00 PM
Southampton Free Library, 947 E. Street Road
Southampton, Pennsylvania 18966

VOLUME XXXVIII

January 1996

Number 1

THE PREZ SEZ

On behalf of the club officers and directors I hope everyone has had a happy holiday season and wish all of our members and friends a happy, healthy, and prosperous new year.

The dawning of the new year prompts many people to review their situation and habits and resolve to make changes. From the activity on the bands the past few weeks it seems that quite a few of our members new year resolutions include improving their station. The pre-contest period is one of the best times of the year to spend time in the shack. Everyone is willing to lend a hand from band checks to helping to locate the one part you need to finish your big project. When else can you sit and ragchew on 903 or 2304 or even 10 GHz and know that the other guy is happy as you are to make the contact and several other stations are furiously tweaking their preamps and hoping your long winded. It's also a great time to catch up with old friends who only seem to pop up at this time of year. But alas all good things come to an end, in this case the end is the January contest which is only a week or two away. Are you ready? Do you know for sure? The best way to find out is to turn everything on and make contacts on all the bands. Don't wait till the last Monday night net before the contest to discover that your most reliable band has gone south for the winter.

Just in the nick of time, the W3CCX beacons are back on the air. With luck the 432 thru 2.3 GHz beacons will stay available throughout the contest at their new location in FM29jw. Many thanks to Ron WA3AXV, Jack N3DQZ, and Steve WB3KRW who have spent an enormous amount of time rebuilding and installing the new beacons. I hope you guys took pictures for homebrew night!

Well the editor is muttering at me about deadlines so I guess that's all for this month. I hope everyone does well in the contest and doubles their last years score but more importantly I hope you all get on and help the club win another gavel. Lets show everyone that the Pack is Back.

73 and gud luck in the contest.

73, Phil, WA3NUF

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PACKRAT 222 MHz REPEATER - W3CCX/RPTR

222.98/224.58 MHz, Churchville, PA




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	N3OZO,	Don Schwartzkopf (2 YR)
	WB3KRW,	Steve Dallas (2 YR)

<u>MONDAY NIGHT NETS</u>			
<u>TIME</u>	<u>FREQ.</u>	<u>NET CONTROL</u>	
7:30 PM	50.150 MHz	K3EOD	
8:00 PM	144.150 MHz	W2EIF	
8:30 PM	222.125 MHz	WB2YEH	
8:30 PM	224.58R MHz	K3ACR	
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: WA3YUE 610-630-1875
JUNE CONTEST: WB3DNI 215-672-5289
HAMARAMA: WB3JYO 609-538-1687
VHF CONFERENCE: KB3XG 610-584-2489

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From klimas@uhavax.hartford.edu Mon Jan 1 16:09:05 1996
 From: klimas@uhavax.hartford.edu
 To: hbrown@resd.vf.ge.com
 Subject: Preliminary list of N.E.W.S. Group members for Jan. contest de WZ1V
 Date: Mon, 01 Jan 1996 16:03:36 EDT

Here is a current list of N.E.W.S. Group members within the club area which may be active in the January 1996 ARRL VHF Sweepstakes:

MARK	AA1AK	FN31	ABD	203-347-2664
GUY	AA7QZ	FN21	ABCD9E	201-208-1854
JOHN	AC1T	FN32	ABD	413-789-0446
DALE	AF1T	FN43CD	ABCD9EFGHI	603-428-3840
JOHN	AI1K	FN41GT	ABD	401-943-3106
Robert & Scott	K1CPJ/KAIQAS	FN31	ABCD9EFG	203-872-9838
DON	K1DH	FN32	ABCD	203-653-2295
RICK	K1DS	FN41	ABCD9EI	401-272-5626
BETSY	K1EIC	FN31	BD	203-929-7759
STEVE	K1FO	FN31QJ	CDE	203-421-4836
JOHN	K1FWF	FN42EJ	ABCD	508-779-6189
PAUL	K1GX	FN31	B	203-875-3798
AL	K1JCL	FN31	ABD9E	
DAVID	KIMBO	FN42	ABCD	508-263-0454
LARRY	K1MNS	FN42IV	ABCD9EFGI	603-432-5866
HARVEY	K1P2S	FN31	B	203-653-7796
ED	K1TR	FN42	ABCD9E	603-437-0599
RON	K1VYU	FN31	ABD	203-399-5634
DAVE	K1WHS	FN43	ABCD9EFGHIL	207-658-9076
PAUL	K1WVX	FN31PX	ABCD	203-668-2079
DAVID & LINDA	K1ZZ/KAI2D	FN31TT	ABD	203-742-0858
JUD	K2CBA	FN32	ABCDE	518-279-3640
DICK	K2RIW	FN30HT	BDI	516-423-1963
LEE	K2SBI	FN21	BD	201-529-1858
BARRY	KAI1CLV	FN42	ABD	508-897-9835
MICHAEL	KAI1EKR	FN42	ABCD	508-877-1154
MERT & MARTHA	KAI0TP/KAI0TO	FN41	BD9EI	
IVAN	KAI1YQ	FN42	AB	508-952-2632
STAN & KEVIN	KAI1ZE/NR1L	FN31	ABCD9EFGH	203-872-6197
BILL	KA2VJV	FN31	ABD	914-279-5035
PHIL	KB2HQ	FN32		
BRUCE	KC1US	FN42IL	BD	617-275-3740
JIM	KC1ZN	FN41	BD9E	
DEL	KD1DU	FN31FI	ABCD9E	203-431-4233
KEVIN & KATHRYN	KD1NW/KB1BDD	FN41	ABJ	401-364-9021
ZACK	KH6CP	FN31	ABCD9EFGHIL	203-667-3849
DAVID	KT1X	FN42GJ	AB	508-443-7704
George	KX1C	FN42	ABCDE	508-562-3137
PAUL	NI1BWT	FN42EN	ABCD9EHI	508-425-2564
WALT	NI1CJB	FN31	BD	203-235-5406
FRED	NI1DPM	FN32	ABCD9EFGH	413-786-7943
Byron	NI1EKV	FN42	BD	617-862-1380
ED	NI1FMP	FN34	ABCDEI	802-454-1131
FRANK	NI1FUS	FN42	ABCD	508-853-0356
JIM	NI1HOV	FN53	ABD	
JEFF	NI1KBY	FN32	BD	413-786-2517
CLINT	NI1KTM	FN41	ABD	
MARK	NI1LZC	FN32	ABC	413-566-2445
PAUL	NI1LZK	FN32	B	413-566-3070
JOHN	NI1OWA	FN42	AB	508-473-3039
HARRY	NI1QVE	FN31NO	ABD	203-620-9178

NOTE: KEN, KP4XS, EM84XP, will be looking for Packrats, Sun. morning at 0830 AM on 50.185. Ken will be running 1 kw.

STEVE	N1SR	FN32RE		
VINCE	N1VC	FN31	BD	
RALPH	N2BMN	FN20	AB	
STEVE	N2CEI	FN20ML	ABCD9EF	908-996-3584
MIKE	N2HPA	FN31	BCD9FI	
MARK	N2HTU	FN30	BDEI	718-739-3574
JOHN	N2KFC	FN30	B	718-729-8804
BRUCE	N2LIV	FN30KU	ABCD9EF	516-265-1015
HANK & LILI	N2MSS/N2RDN	FN31	ABD	914-644-4771
RUPERT	N2OTO	FN30	BD	718-539-0707
RICK	N2PLQ	FN31AG	AB	914-947-1986
DAVE	N2UAH	FN20	ABD	201-267-1065
SCOTT	N2YCA	FN32	ABCDE	
AL	NA1W	FN32	ABCD9EFG	413-788-9845
LOU	NB2T	FN30	B	
FRANK	NC1I	FN32	D9	413-569-0314
TOM	W1EJ	FN42	ABCD9E	603-635-2514
ARNIE	W1GCI	FN42	ABCD9EF	
TED	W1JOT	FN42	BI	617-444-7388
JOE	W1JR	FN42EV	ABCD9EFI	603-673-5232
ART	WIKK	FN32	BD	
STRATFORD ARC	W1ORS/N1ORW	FN31	ABCD	
DAN	W1QK	FN31	ABCD	203-775-9525
KEN	W1RIL	FN42	ABCD9EFGHI	508-757-3966
RAE	K1LXD	FN31	ABCD	203-742-8650
JIM	W1XR	FN42HW	ABD	603-437-8625
JOHN	W1XX	FN31		PORTABLE
DON	W2GKR	FN31	AB	914-462-1729
MGEF/RPI ARC	W2SZ/2	FN22	ABCD9EFGHIJ	
Robert	W2XL	FN31	ABCD9E	914-331-0437
Emil	W3EP	FN31	ABD	203-642-7271
TIM	W3HHN	FN32	ABCDE	518-672-4597
STEVE	WA1AYS	FN42	AB	
STAN	WA1ECF	FN41	ABDEI	
Paul	WA1GMN	FN42	BD9	603-878-2629
TOM	WA1MBA	FN32SL	BD9EFGHI	413-259-1921
ERNIE	WA1NIE	FN43	ABCFI	603-895-0347
ROBERT	WA1OFR	FN42MA	ABDHI	508-586-4420
JOHN	WA1TFH	FN42	ABCD9EFGHIJ	603-898-6004
HARRY	WA1VVH	FN42EQ	BC9EI	508-433-5463
SHAUN	WA1YLP	FN41	B	401-792-3503
DICK	WA2AAU	FN22	ABCD9EFGHI	518-895-2798
WALT	WA2ALV	FN33DH	ABCDE	518-792-5162
Stan & Michele	WA2BAH/KA2MCU	FN32	ABCD9EFGHI	518-462-9417
Jeff	WA2TEO	FN31	ABCD9EF	203-452-7656
ART	WA2TIF	FN42	BCD	508-478-2256
FRANK	WA2TJR	FN31	ABCD	203-374-8765
LAD	WA3EEC	FN32	ABCD9EI	413-549-6984
GARY	WB1AUA	FN31	I	
BILL	WB1BRE	FN33	BCDE	802-333-4623
David	WB1CMG	FN42	ABCD9E	603-673-4186
DON	WB1FKF	FN42JK	ABCD9EFGHI	617-933-1599
DAVID	WB1FLD	FN42IW	BD	603-432-8456
RICK	WB2QQQ	FN20	B	908-464-8911
CHRIS	WB2VVV	FN21XA	ABCD9EI	201-930-1583
DAN & DONNA	WB2WHD/WA2ILD	FN22	ABCDEFI	518-895-2754
BOB	WF1R	FN32	BD	
DAVID	WG3I	FN20WW	ABCDEFHIJ	
SCOTT	WOLG	FN42	ABC	508-779-8379
John	WW1Z	FN42ET	ABCD9EI	603-673-1818
RON	WZ1V	FN31MP	ABCD9EF	860-589-0528
ARNIE	WZ20	FN30	A — F	718-763-0616

January Contest- January Update

By AJ, N3ITT

Well, here we are only 3 weeks left until the January Contest - where has the year gone. Seems like I just finished putting the stuff away from June! I hope some of you were able to get some antenna work done we finally had some decent days after like 5 lousy weekends. I've done most of my work here and tried to help as many Rats as possible, although work and of course preparing for the holidays has really kept me busy. As promised, last month was the help fest, hopefully some benefited by it. I only wish I had more things to list.

Lately, it's been great to hear lots of PACK RATS working towards the contest and I sense a lot of enthusiasm this year. Looking at the figures, I can see no reason why we can't be UNLIMITED Club winners this year, but it will certainly take the maximum effort from everyone. Start planning NOW to leave as much time on January 20 and 21 to operate in the contest - remember the more time you spend on the air, the better your score. For those of you who do have limited time, try to work as many Packrats as possible!! Between now and the contest try to get on the bands, talk up the contest and the PACKRAT Award!

At the time of this writing, I have a list of 51 possible logs - This is NOT a comfortable margin. This is why I'm urging everyone to try to get on the air this January, don't think because you can't make a big score that you're not going to help much - every QSO and Log counts.

OK, that's about it for now. CU on the bands

Calendar of Coming Events - January 1996

- 1 Mummers Day.
- 4 Predicted peak of the Quadrantids meteor shower at 0701 UTC.
- 11 Board of directors meeting at the QTH of Ernie, W3KKN. All interested parties welcome. For directions call 215-659-3485. Meeting starts at 8:00 P.M.
- 13 Harrisburg Hamfest at the Oberlin FC Social Hall, exit 1 off I-283, 1 mile N on PA 441. TI on 147.76.
- 15 Martin Luther King Jr. Day.
- 18 Regular meeting of the Mt. Airy VHF Radio Club at the Southampton Free Library on Street Rd. in Southampton, Pa. All VHFers and would be VHFers and friends are welcome.
- 20-21 THE CONTEST. Everyone's help in getting at least 51 logs submitted this year is necessary to qualify the club for the Unlimited Class in the club competition. See Dec. Cheesebits or consult your contest package for the rules.
- 28 Maryland Mobileers ARC Post Holiday Swapfest and Flea at Odenton Vol. Fire Dept. Hall in Odenton, Md. VE Exams. TI on 146.205/805

SWAP SHOP

(send all ads to the editor)

For Sale: 3 each Motorola Mitrek 900 MHz Class C amps. 500 mw in/20 watts out with 3 spare amps for parts - working? For sale or preferably trade. Contact: Joe, N3IBX, 215-295-8452.

For Sale: SSB Electronics 2304 MHz Transverter system. 1/2 watt output, 145 MHz if, 2 loop yagis and transistors to build an amp for higher power. Contact John Bednar, WB3ESS at 610-767-6861 evenings after 6 PM.

For Sale: Toko 4 section Helical filters for insertion into your 903 LNA output. Two 2-section Tokos in cascade (4 sections total), pretuned for 902-903, with hookup and sweep 902-912 = 5 dB IL, rejection @ 890 = -20 dB, 880 = -35 dB, 870 = -45 dB, 860 = -55 dB MHz with test data. \$15.00 post paid. Contact Ron Klimas, WZ1V at 458 Allentown Rd., Bristol, CT 06010-5967.

For Sale: Dow Key BNC Relays (similar to DK77), 12 volt coil. \$10.00 each. Contact Gary, WA2OMY, 610-539-6409.

Wanted: Your tube type CB rig. Contact Gary, WA2OMY, 610-539-6409.

VHF+ NEWS & ACTIVITY

By Jerome Byrd, K3GNC

"THAT WHICH DOES NOT DESTROY OUR ANTENNA SYSTEM MAKES US STRONGER"

Winter like conditions have dominated the month of December. There have been no band openings (through 23 Dec.), and VERY FEW minutes of enhanced conditions. This author has been making things happen, instead of waiting. With our modest setup, we have been making 350-425 mile skeds with stations located in grids we do not normally work under average conditions. We have been very successful with the "BRUTE FORCE", true weak signal dxing on 144 & 222 MHz. Try it! You will like it!

METEOR SHOWERS: Leonids - What meteor shower?

Geminids: Fizz, Fizz, Pop, Pop, Been there. Done that.

ROVER News: Dallas, N3TUM will be taking his rover setup through the following grids during the January Contest: FM25, FM15, FM27, FM28 (He also might stop in FM 16 and FM17). He will have 6, 2, 432, and possibly 222 MHz capability.

STATION WATCH: VE2/SM0FDP (FN35) is ON WEDNESDAYS AT 0200 UTC on 432.100 - Looking for contacts (CW). He is QRV on 144...1296 (except 222) MHz.

Tom, WA8WZG (EN81), who missed the last three contests, due to a move to a new QTH will be BACK in January! I worked him under dreadful conditions (cold -snow) a few days ago, so with any luck many of the PACKRATS should be able to work him in January. He will be QRV 50-10 GHz.

Gary, WA8TJL (EN91) is a strong station to look for during the contests or almost any night. He is QRV 50-2304 MHz.

Calls and Grids to note: WA4TNV (FM05), KV8S (EM99), KP4XS (EM84), K4HJE (EM96), KM1E (FN53), VE3EKP (FN06), VE3BQN & VE3BFM (FN04), VE3URS (FN15) and N4BG (EM97).

LET LOOSE THE DOGS OF WAR: AA2UK QRV 50-5763 (with POWER), K1RZ -new coax all bands, FO33 on 432, WZ1V 2304 MHz, WB5IGF - microwave escalation, W3ZZ - more kilowatts, WB2JHG - 2304 MHz, N3AOG - everything, N3NGE - Tower (s) and antennas and a host of others...

Please let me know about any openings, nets, propagation, etc.

CQ-VHF Hits the Streets

By Harry, W3IIT

The new VHF magazine from CQ is out. I saw a copy at Gene's Book store in King of Prussia and got a copy in the mail. It seems to cover all facets of VHF activity from FM repeater activity to "weak signal" work as we know it. The first issue, January/February 1996, is very general with articles on a variety of subjects from repeaters through e-skip. Hopefully it will get some meat on it that will attract the weak signal crowd. There is plenty of material available but how to present it so as to not scare off the average ham who knows little aside from VHF FM repeater operation will be a challenge. We all know how great weak signal hamming and homebrewing is - it's up to us to present it in a manner to attract others - it's sure to our long range benefit. When you read about the raffling off of the VHF and microwave frequencies, it's difficult to wonder when "our frequencies" will be next. There's a lots of commercial services that could use the 50, 222 and the 432 MHz bands. It doesn't take a 50 MHz chunk of spectrum for possible services such as high data rate two way paging using a low orbit constellation of satellites. Using the frequencies during vhf contests and repeaters is not going to be very convincing to commercial interests and politicians that both see lots of \$ for their businesses and for the US treasury.

CHEESEBITS SUBSCRIPTIONS

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

Name: _____ Call: _____

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January 1996

Send to: SUBSCRIPTION/ADVERTISING MANAGER:

Bob Fischer, WB2YEH

7258 Walnut Avenue

Pennsauken, NJ 08110

TID BITS

A note from Rich, N0HJZ: Looks like the Pack Rats are gearing up for a FUN contest! The Northern Light Radio Society is looking to have some fun too! We are trying to get enough logs together to join you and the Rochester group in the Unlimited Category! Would you put the following in your next issue: WANTED: Six meter scatter skeds in the January contest. I will have about 200 watts and a four element yagi at 40 feet. I will probably be the only station in my grid running scatter. To set up a sked, call me at (612) 934-7580 or e-mail me atn0hjz@aol.com. I'll run anytime during the night or day! Rich, N0HJZ (EN34) 50-2304 MHz. Thanks!! 73 & Happy Holidays and good luck in the contest!

A note from Ken, KP4XS, re the Jan. contest: I will spend 6m scatter time from about 6 am- 8 am on 50.125 so please let those guys know to look for EM84 on Ms assuming we don't have any Es. Hope the conditions are better than the September contest! I am ready to go on all bands from 50 thru 1296 running 1 kw on 50 thru 432, and 50 watts on 903 and 10 watts on 1296. I will be looking for the RATS. 73 Ken.

The 1995 September Contest results are in (see Jan. QST). Packrats AA2UK, WB2YEH, K3GNC, WB3JYO, K3DMA, W2EIF, WA3JUF, KB3IB, KB3QM and W3HQT submitted logs. Bill, AA2UK ended up 6th overall in the single operator category. W3HQT, AA2UK, KB3QM and K3GNC all took first place in their sections.

TNX to K3LOM for the donation of 3 Midland 13-509 222 MHz FM Transceivers to 3 of the Rats. Should help during the contest.

In the October issue of QEX, Rainer, DJ9BV, has an article for a PHEMPT Preamp for 13 cm. It has a NF of 0.35 dB and a gain of 15 dB. Artwork, construction information and addresses for complete preamps or kits is included. In the November issue, Zack, KH6CP/1 describes an HB WR-90 Waveguide to SMA connector transition and includes construction information and the return loss is better than 20 dB without tuning.

In the NTMS newsletter, FEEDPOINT, Dave, WG3I, has an article on "The WG3I PIC keyer. It provides a means for keying a beacon and includes artwork and a schematic. Completed preprogrammed boards are available for \$15.00. A second beacon identifier article was by Steve, W7VMF, and John, W7HQJ using an 8748 Microprocessor. Again, in addition to the description of the circuit, a board layout and schematic are included. The results of the 1995 Microwave Update NF Measurement results were provided. The top results for each band are :

<u>Band (MHz)</u>	<u>Call</u>	<u>Design</u>	<u>Device</u>	<u>Input Network</u>	<u>Noise Figure (dB)</u>	<u>Gain (dB)</u>
902	WA0RDX	HB	MGF4918D	LC	0.25	24.90
1296	KD4LT	AGO	NE325	LC	0.25	29.94
1296	WD5AGO	AGO	NE325	LC	0.25	16.25
1420	WD5AGO	AGO	NE325	Microstrip	0.29	17.20
2304	KH6CP	HB	ATF36077	LC	0.35	17.20
3456	KH6CP	HB	NE326	LC	0.54	13.70
5670	KH6CP	HB	NE326	Microstrip	0.54	14.18
10368	JE1AAH	HB	NE329	Microstrip	0.68	13.20
24192	JE1AAH	HB	NE329	Microstrip	1.93	17.91

K2AA is announcing a Kids Net every Sunday night on 145.290. It is run by kids and it's purpose is to foster an interest in Amateur Radio. Be a control operator for some youngsters and check into the net. Encourage the hams you know to check in also. The regular SWAP SHOP NET follows the Kids Net. Net Control is Vince, N2WXE.

Using the MFJ-484 as a Beacon Keyer

by Dave Mascaro, WA3JUF

The modification described here was done to an MFJ Grand Master keyer, but could be used for other MFJ keyers also. A tune switch is added ahead of the memory circuits so a key down could be programmed.

The simple mod uses a 330 ohm resistor and a miniature (normally open) push button switch. These components are connected in series between Pin 5 of U4 and ground.

Pin 5:U4 ---- 330 ohm ----- PB switch --- ground. I soldered the resistor lead directly to the IC pin. The momentary switch was mounted on the rear panel.

Packrat Notes

(a few copies are available)

For the Mid Atlantic States VHF Conference, a reprint of the best articles from Cheesebits over the last 3 or so years was published. A limited number are available on a first come, first served basis. The price is \$12.00 per copy, postpaid. For a copy send a check made out to the Mt. Airy VHF Radio Club to Dick Comly, N3AOG, 56 Home Road, Hatboro, PA. 19040. The table of contents of Packrat Notes and the authors are:

<u>Area</u>	<u>Article</u>	<u>Author</u>
ANTENNAS	Parabolic Antennas and Their Feeds 902/903 MHz DL6WU Yagi Match The Strength of Masts	Dick Comly, N3AOG Dave Hackford, N3CX Dick Comley, N3AOG
AMPLIFIERS	Driving Solid State Amps Parallel MMIC's More AM-6154/55 PROBLEMS	Dave Mascaro, WA3JUF John Sortor, KB3XG Ron Whitsel, WA3AXV
TRANSVERTERS	A "Crunch-Proof" 144 MHz Transverter Building No-Tune Transverters 10 GHz Transverter, "All the Boring Details"	Paul Drexler, WB3JYO Dave Mascaro, WA3JUF John Sortor, KB3XG
MEASUREMENTS	Microwave RF Power Monitor Cheap Microwave Detector	Dave Mascaro, WA3JUF John Sortor KB3XG
MODIFICATIONS	High Level Mixer/LO Modifications for the 903 MHz No-Tune Transverter The AM-6154/55 on 222 MHz Phase Lock Loop Source Modifications	Dave Hackford, N3CX Ron Whitsel, WA3AXV Dave Mascaro, WA3JUF
HINTS & KINKS	3456 MHz Isolator/Circulator Hybrid Power Splitters Coaxial Antenna Relays 2 Meter IF Load/Attenuator IF Switching More Pipe Cap Mania Temperature Compensation for Crystals	Dave Mascaro, WA3JUF Chuck Steer, WA3IAC Dave Mascaro, WA3JUF Dave Mascaro, WA3JUF Gary Hitchner, WA2OMY John Sortor, KB3XG Dave Mascaro, WA3JUF

DO YOU KNOW WHERE YOUR MICROWAVE TRANSVERTER IS?

by Dave Mascaro, WA3JUF

Every year during the June contest we experience the same problem. We are not sure of the frequency calibration of the microwave gear. The equipment inside the Ryder trucks can get very hot during the day and cool off at night. Even with crystal ovens on the Phase Locked Loop oscillators, the LO frequency can vary up and down.

Over the years we have used microwave frequency counters connected thru couplers. We have measure the PLL oscillator frequencies and figured the frequency with a calculator. But moving the counter from one output or PLL to another and calculating all the numbers gets old real fast.

During a lull of this year's contest, I wrote a program that would take the place of the calculator, by inputting the microwave sked frequency and the PLL frequency and spitting out the proper I.F. frequency. This worked great. Phil, WA3NUF and I would park the 2 meter rig on the correct frequency just before trying to work our rover, KB3XG. It was amazing how many times we heard John the first time he called. Knowing where your frequency is, eliminates one variable. John knew what frequency he was on, which also helped a great deal.

After the contest I got to work on the transverter rack and installed switching to move the frequency counter to the PLL being used. Since multi-port coax relays were used to band-switch, why not do the same thing with the PLL frequencies. A multi-port coax relay now switches the 90-100 MHz range PLL signals to the counter when bands 2.3 GHz thru 10 GHz are changed.

While in the logging mode, it is easy to shell out to LO.EXE and input the desired microwave frequency and the PLL frequency. The computer outputs the 2 meter I.F. frequency and returns to the logging program. Then the contact is made. Simple !

Use of Microwave Phase Lock Sources

By Dave Mascaro, WA3JUF

Most of the Phase Lock Loop (PLL) microwave sources that show up at flea markets and surplus houses are useable for Local Oscillators in one form or another. The output can be used as a LO for a transverter or as a beacon transmitter. Normally the PLL sources consist of a 1.2 - 1.7 GHz free running 0.5-2 Watt oscillator that is phase locked to a crystal reference, then coupled into a frequency multiplier consisting of a Step Recovery diode and a bandpass filter, which passes the harmonic of interest. Power output can be up to several hundred mW depending on the model.

The units come in many frequency ranges and can be used directly or modified. Brand names are Frequency West, M/A Com and Fairchild to name a few. The phase lock reference crystal can be internal OR external. Both can be used for Amateur LOs. Don't shy away from the external units ! A simple oscillator/buffer with a 70 deg C thermistor attached to the crystal is easy to use. It is not necessary to buy high accuracy (expensive) crystals to get "right on frequency". As with all LOs, consider yourself lucky if it comes out on frequency. When ordering crystals, giving the vendor the model number and an oscillator circuit drawing will help you get the proper crystal. Cheap HC-8/U xtals do work in the ovenized PLLs, however. Refer to Jan 1995 CB Hints & Bits.

Basically, you need to re crystal the unit, tune the cavity for a lock, then tune the SRD output bandpass filter. Make sure you use an alarm circuit to tell you when it's locked ! Some sources can have lock problems at temperature extremes in the field. Tuning the output filter requires a Spectrum Analyzer. Most SRD filter units will come off the power cavity with 3 screws. The filter can be rotated so the input probe is still in the cavity. A C-clamp will hold it in place while adjusting the tuning screws. Usually there is sufficient LO to be split 2 ways to feed two mixers. Refer to May 1993 CB Hints & Bits for more modification info.

1. No mod tunable for normal LO (Fo - 144): Frequency West units in the 3-4 GHz range can be re-tuned for 3312 MHz. There are quite a few M/A 5.9-6.4 GHz units around, both internal and external referenced. These tune to 5616 MHz no problem. 3312 LO Xtal = 92.00 MHz, 5616 MHz LO Xtal = 93.60 MHz.

2. No mod tunable for high side LO injection (Fo + 435 or Fo + 144): This type of unit won't quite tune down to make a low side LO. Freq West and M/A Com 10.6 GHz PLLs can be used for a 10368 MHz transverter (+ 435). The 6 GHz units work good for 5760 MHz (+ 144). Note: Use LSB to operate on USB. These units also make good beacon transmitters. Use an isolator/ PIN diode switch to CW key or use FSK. 10.3683 GHz beacon Xtal = 103.6830 MHz.

3. Cavity tuning modified for normal LO: The power cavity on some units won't quite tune down to the proper harmonic. Changing the length of the tuning inductor or the size of the cavity is required. I adjusted a cavity to tune 1080 MHz to be used as a 2160 MHz LO by changing the inductor length and milling out the cavity. Xtal was 90.00 MHz.

4. Cavity tuning and cavity output modified for normal LO. An M/A Com 5.9 GHz PLL is the 1152 MHz LO of my 1296 transverter. The multiplier is removed completely and an SMA connector/probe is installed in the cavity and connected to an external UT-141 interdigital filter. The inductor was lengthened to tune 1152 MHz. Pout is a healthy +30 dBm, but easily attenuated and split. Xtal = 96.00 MHz.

5. Cavity output modified for homebrew SRD multiplier driver. Again on a M/A Com 5.9 GHz PLL, the output multiplier is removed and an SMA connector attached. The cavity is tuned to 1656 MHz for example to drive a X2 SRD multiplier filter for a 3456 MHz transverter. Xtal = 92.00 MHz.

6. Using the SRD/filter module with modifications: The SRD/filter units are excellent high efficiency multipliers that are great to connect to whatever oscillator you might have. An SMA connector can be installed in place of the input probe and the unit attached to a power boosted DEM 540 MHz LO Board. Or the filter can be removed with a bandsaw and the SRD assembly can be used with your own homebrew combline filter or W2CQH design interdigital filter.

Tune up: To decide whether your surplus unit is good for an LO, you need to find the crystal frequency, see if the cavity will oscillate and lock at the proper harmonic in the 1.2 - 1.7 GHz range and whether the output filter will tune. First put the unit on a spectrum analyzer and verify that it works at the design frequency.

There is one easy way to find out what the crystal frequency should be and whether the unit will work. Use a GOOD Synthesized Microwave Sweeper as a reference in the 90-105 MHz range. Externally referenced units lend real well to this operation. While looking at the output on the analyzer, start the sweeper at the design reference frequency. As you move the tuning screw slightly, you will see the output sweeping 20-40 MHz before it locks. It should lock when the exact frequency is set. Then tune the cavity while moving the sweeper frequency. See if you can lock it at the proper harmonic frequency. If not, decide if you need to modify the cavity. After you get a lock, then see if the output filter will tune to your LO frequency. Good Luck.

144 MHz and Up Beacons

Via WZ1V NEWS WWW Page. TNX to K1GVM, K2LME, VE1KG, W3EP, W3ZZ.

<u>Freq.</u>	<u>Call</u>	<u>Grid</u>	<u>Location</u>	<u>Notes</u>
144.275	KS2D	FN20qh	NJ PRINCETON	1 mW + Big Wheel
144.275	W4RFR	EM66		0.25 w+ halo
144.275	WB4OOJ	EL87	FL Tampa	25 w & Big Wheel
144.276	W2RTB	FN12ar	NY	15w Eggbeater
144.276	VE1SMU	GN03	Sable Island	10 W 5 el Yagi to west
144.276	VE2FUT	FN25wg	PQ Rigeau	15 W+ Turnstile 550' ASL
144.277	KA0EWQ	EN15	MN Johnson	10 w+ 3 el yagi aimed SE
144.280	N4MW	FM17	VA New Kent	30 w+ Sqloop@20'
144.280	VA3KRP	EN58	ON Thunder Bay	25 w+ 2 yagis to SE QSL VE3KRP
144.280	VE2FTR	FN08		60 w+ 2 quads to south QSL VE2UG
144.282	WD4LWG	EL87	FL St. Pete	75 w+ vert 1 min 10s sig+ ID, chirp
144.287	KB8JI	EN64we	MI	1W ERP 1100' ASL
144.287	W0VD	EM27		
144.289	WA2UMX	FN23xc	NY Providence	20 w + 2 Big Wheels 1620' ASL
144.289	KL7GLK	FM18	MD Annapolis, south of	
144.292	W9IP/2	FN24kp	NY Canton	40 w+ 5 el yagi aimed North for AU
144.295	WA8R/9	EM79qb		15 w+ turnstile
144.295	WB0QIY	EN01rf	NE Grand Island	70 watts+ big-wheel @40
144.296	W3VD	FM19ne	MD Laurel	10 w+ halo freq. varies QSL W3TMZ
144.296	WD4KPD	FM15mm	NC Washington	20 w+ 2 halos @30'
144.297	WB2CUS	EL98	FL	0.5 w+ Isopole
144.298	VE1SMU/H	FN84	NS Halifax	1.5 w 7 el Yagi SW, FSK per VE1KG
144.299	WZ8D	EM79	OH	25 watts
222.055	VE1SMU	GN03	Sable Island	10 w 5 el yagi to west
222.058	W2RTB	FN12ar	NY	10 w+ 2 bay vertical
222.058	WB4NKM	EM86		info de W3ZZ
222.280	VE2FTR	FN08		6 w+ 2 quads to south QSL VE2UG
432.280	VE2FTR	FN08		35 w+ 2 quads to south QSL VE2UG
432.300	VE1SMU	GN03	Sable Island	8' dish to west
432.300	W3CCX/B	FM29jw	PA Philadelphia	2 w to big wheel @ 435'
432.303	KW2T	FN13		0.25 w FSK
432.305	W4RFR	EM65		10 w+ stacked pair of halos
432.306	W2RTB	FN12ar	NY	15 w+ Eggbeater
432.309	WA4ZTK	EM85ar		0.9 w+ yagi to northeast
432.313	W3VD	FM19ne	MD Laurel	7 w+ turnstile QSL W3TMZ
432.315	WA4PGI	FM07bw	VA	5 w+ crossed dipoles, +/- 5 KHz
432.328	VE2CLO	FN35	Montreal	10 w + 2x12 yagis south/west
432.339	VE1SMU/H	FN84	NS Halifax	per K1GVM & WZ1V
432.365	K8AXU	EM99		1W ERP, TX ALTERNATE MINUTE
902.345	VE1SMU	GN03	Sable Island	7 W 2 bay horiz. pointed west
902.550	N2NEP	FN13da	NY Henrietta	10 W + Big Wheel
903.075	K4EJQ	EM86		1 w+ dipole
903.310	VE2CLO	FN35	Montreal	10 w + corner refl. 10 dB SW
1296.005	K4EJQ	EM86		3 w+ dipole
1296.040	W3VD	FM19ne	MD Laurel	0.7 watt to slot @ 118'
1296.050	K3IVO	FM18sx	MD Annapolis	240' ASL, 100 mw NFSK, drift +5w/temp
1296.075	WD4GSM	EM86		5 watts to Alford slot
1296.180	WD5AGO	EM26	OK Tulsa	3 watts to yagi aimed East
1296.200	WA4PGI	FM07	VA	5 watts to Alford slot
1296.276	W2RTB	FN12ar	NY	15 watts to Eggbeater
1296.310	VE2CLO	FN35	Montreal	15 w + double diamond 10 dB SW
1296.345	VE1SMU	GN03	Sable Island	6 W ft. dish horiz. to west
2304.015	VE2CLO	FN35	Montreal	0.6 w + double diamond 10 dB SW
2304.048	K4EJQ	EM86		1 watt to lpy
3456.076	K4EJQ	EM86		1.5 watt to lpy
10368.275	KS2D	FN20ok	NJ Princeton	2 W omni 6 slot horiz. waveguide

Please forward updates to Ron Klimas WZ1V: Internet email: klimas@uhavax.hartford.edu.

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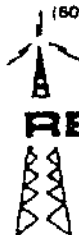
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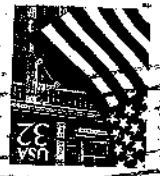
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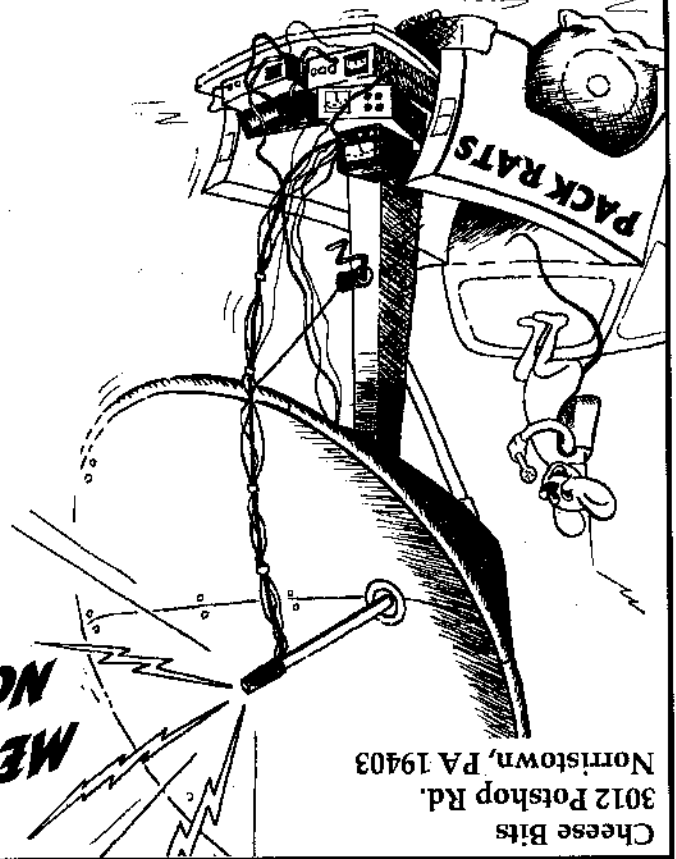
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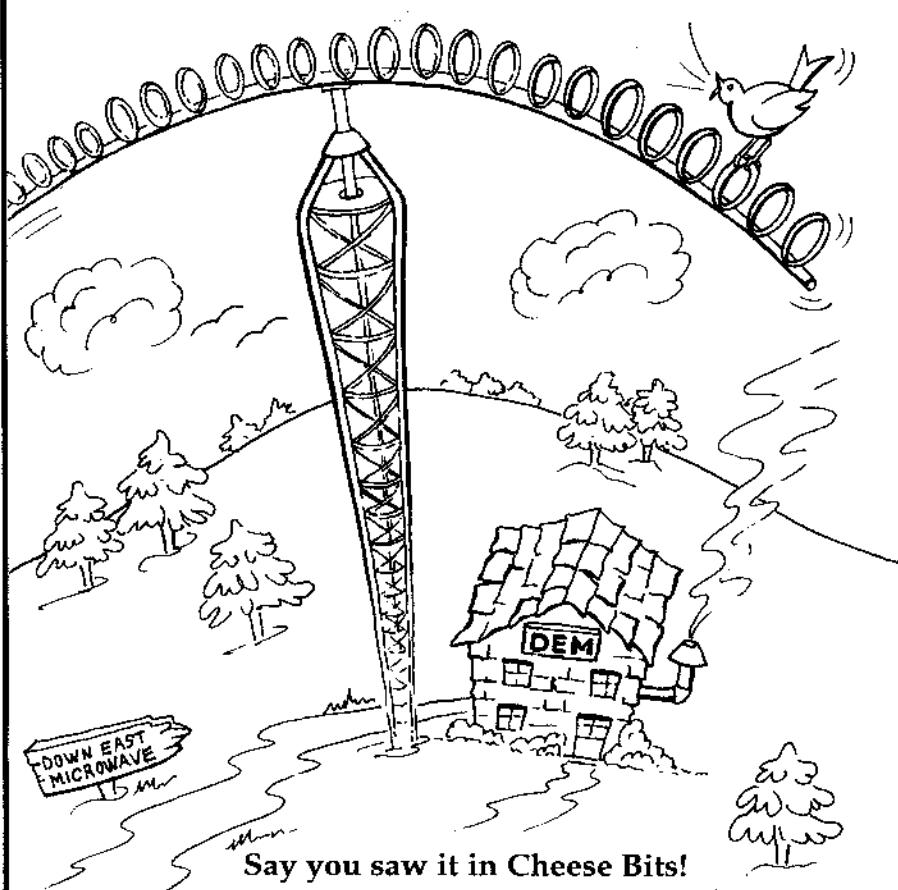
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