



MT. AIRY VHF RADIO CLUB, INC.

CLUB CALL: W3CCX

PACK RATS'

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

SCANNED TO PDF BY BERT, K3IUJ, 2013

VOLUME XXXVI

December 1994

Number 12

THE PREZ SEZ

At our November meeting we had an OSCAR satellite presentation by our AMSAT area coordinator Jack DiStefano, KA3YJR. Jack did an excellent job covering a lot of ground in a short period of time - I had no idea there were so many OSCAR satellites up there these days! With modest equipment quite a bit can be worked thru the birds using the various modes. This aspect of our hobby seems to attract people with interests that are very similar to ours. Perhaps we should be introducing the satellite hams to the VHF/UHF/Microwave weak signal terrestrial modes... With their existing equipment and the addition of perhaps a high gain yagi I bet they'd be surprised what they can work!

The VHF Building Sessions at Gary, WA2OMY's have been very productive! Several Rats have already gotten on new bands, with many more right behind. Our newest member Jack, N3DQZ built, packaged and tested his 1296 NoTune transverter in record time. Jack completed the entire task and was making contacts in just 1 week! Ask anyone who's just gotten on a new band and they'll probably tell you they had lots of help from other Packrats. That's what it's all about. There's always help available; all you have to do is ask!

For the last several months I've talked about setting goals for your station and making technical improvements to enhance your overall contest effort. All of us do well on some bands and maybe not quite as well on other bands. After looking at where improvements could be made this could mean getting on a new band, running higher power, installing a better antenna, or maybe upgrading your station's feedlines. The point is that since each of our stations are unique, each can benefit from different improvements. The same kind of situations exist for operating habits as well. Each of us have our own unique way of operating the contests, hopefully we've learned how best to operate our own stations. If I'm running big power and in a good location I can be very productive by spending more time calling CQ than if I was operating from the bottom of a VHF ravine. If I don't have any of the bands above 903 for instance, I might be able to spend more time operating 144 and 432 at night and in the mornings to pick up a few more QSO's.

Continued on page

PARALLEL MMIC's

By: John, KB3XG

I was recently tasked with designing a 100 mW stage for the 300 to 500 MHz band. Since cost and board space was at a premium, I decided to try paralleling MMIC's. I have used this technique on my ham projects, but never looked at the performance on calibrated test equipment. As you might expect, the input and output impedance dropped to 25 Ohms. A single L-section brought me back up to 50 Ohms. A transformer could be used for increased bandwidth, but this will decrease both gain and power out.

50 Ohm lines (0.110") were carved out of the top and bottom surface of the board. Care should be taken to keep the line lengths as equal as possible. Drill a hole through the G-10 and use a small piece of copper tape to connect the top and bottom ground planes through the hole. Use a Dremel tool to cut slots in the board to interconnect the 50 Ohm lines. Use copper tape to edge wrap whatever you can edge wrap. You can never have enough ground. Separate input and output coupling caps were mounted close to the MMIC leads. Separate bias chokes and resistors were installed and a dual supply will be used for the initial evaluation.

The performance was better than I expected. The die in these MMIC's is really linear! No tweaking of the matching networks was required. I purposely mis-adjusted the current (MMIC1=55 mA & MMIC2=65 mA) with no measurable degradation in performance. The pair of MMIC's can be biased from a single source.

I don't see why paralleling 4 MMIC's would not work. The L-section would have to be designed for 50 to 12.5 Ohms or a 4:1 transformer could be used. This medium power amplifier design approach requires no input bias consideration and can handle a higher thermal load. Most medium power parts use the collector as the heat conducting lead. The heat path through the MMIC is through the grounded leads. Keep in mind that 4 MMIC's costs about as much as a higher power part.

Band MHz	Cap. pF	Ind nH	# Turns	Coil Dia.
50	56	100	5.5	3/16"
144	22	30	3.0	3/16"
222	15	18	3.5	3/32"
432	8.2	12	3.0	3/32"

Gain @ 400 MHz = 11.7 dB
1 dB Bandwidth = 100 MHz
1dB Compression = +22 dBm
3rd Order Intercept = +35 dBm
2-Tone Test = -50 dBc, +10 dBm each tone

TID BITS

Fellow Rat, Walt, N3EUV, participated in monitoring the impact of fragments of the comet Shoemaker-Levy 9 as described in an article on page 51 issue of QST. In true Packrat fashion, on July 15th, they decided to build a 15 meter corner reflector and it was built and tested and helped gather data on the comet crashing into Jupiter on July 16th. Now what is my excuse going to be for not getting a looper up on 2304 for the Jan contest? I wonder if they considered a 22 MHz Looper?

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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Subscription Rate: \$10.00 per year (USA), \$12.00 (Canada), \$15.00 (Worldwide)

December 1994

Send to: SUBSCRIPTION/ADVERTISING MANAGER:

Bob Fischer, WB2YEH

7258 Walnut Avenue

Pennsauken, NJ 08110

As Packrats we should focus the same amount of energy improving our operating habits as we do improving the technical aspects of our stations. I know myself in the past I've fallen into the trap of focusing too much energy on my station, and not enough on my operating skills. Most of us check into the nets and this is one way to become better operators. Perhaps the best way to improve our operating skills is simply to operate throughout the week! Turn the radio on a couple of nights during the week and give out a CQ's. It doesn't have to take much time. Get on during Tuesday evenings for the 222 activity night or on Wednesday evenings for 432. You'll learn who's out there to work on the bands, what your station's "good" directions are, and you'll be sharpening your ears to listen for the "weak ones." And of course you'll want to be at the December meeting to get all the latest contest operating hints from perhaps some of the best trained VHF'ers in the nation. CU then!

73, Paul Drexler, WB3JYO

Calendar of Coming Events -December 1994

DEC

- 2-4 ARRL 160 Meter Contest.. See page 131 of the Nov. issue of QST for the rules.
- 5 Check into the 6 Meter Net on 50.150 MHz at 7:30 PM EST.
- 5 Check into the 903 MHz Net on 903.100 MHz at 10:00 PM EST.
- 8 Packrat board of directors meeting at the QTH of Harry, W3IIT. Call 610-584-4846 for directions. All interested parties invited. Meeting starts at 8:00 P.M.
- 10-11 ARRL 10 Meter Contest. 0000 UTC Saturday until 2400 UTC Sunday. See page 123 of the Nov. issue of QST for the rules.
- 12 Check into the 2 Meter Net on 144.150 MHz at 8:00 PM EST.
- 12 Check into the 1296 MHz Net on 1296.100 MHz at 10:00 PM EST.
- 14 Predicted peak of the Geminids meteor shower at 0050 UTC.
- 15 Regular meeting of the Mt. Airy VHF Radio Club at the Southampton Free Library on Street Rd. in Southampton, Pa. Have you qualified to submit a contest log for the January contest for the club by attending the minimum of 2 meetings? Come anyway!
- 19 Check into the 220 MHz Net on 222.125 MHz or 224.58/R at 8:30 PM EST.
- 19 Check into the 432 MHz Net on 432.110 MHz at 9:00 PM EST.
- 22 Predicted peak of the Ursids meteor shower at 1108 UTC.
- 25 Merry Christmas to all.

Jan. 1995

- 21-23 **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 QST page 119 or consult your contest package for the rules.

A TIP OF THE PACK RAT HAT

By: Ernie, W3KKN

Horace Deacon, W3AJF, has just passed his 90th birthday this year. A great milestone indeed. Horace was recently declared an honorary member by the club board of directors. He was first licenced in 1922 as 3BOX and received 3AJF in 1925. A VHFer from early on, he has many stories of the 5 meter days. Everything was homebrew then. Horace has been a club member since it's start and has been in every VHF SS since 1950. This genial, fraternal member gets a "Tip of the Hat" from all of the Pack Rats.

HEALTH & WELFARE

Condolences to Bob, WB2YEH, and family on the loss of his mother.

PACK RAT BUILD SESSIONS

By: Gary , WA2OMY

The fall build sessions proved to be an overwhelming success! Paul , WB3JYO, had taken orders for NO-TUNE kits and add-on amps and preamps etc. at the October board and regular club meetings. The interest by club members was very good since over a thousand dollars of items were ordered. The first build session was scheduled for November 6th, the second for November 26th. The following is a list of participants who were working on both new and old projects, and those providing technical help:

Dave	WB8ZAR	903 and 1296 checkout and construction
Al	K3EOD,	903 and 1296 checkout
Brian	N3EXA,	2 and 6m construction
Don	N3OZO,	1296 transverter construction, checkout, power supply repair
Steve	WB3KRW,	903 construction and checkout
Jack	N3DQZ,	1296 checkout, after completing kit in less than 2 weeks
John	K3DMA,	903 construction.
Scott	N3GSA,	1296 construction, lo completed and checked.
Walt	WA3AQA,	903 and 1296 construction.
Len	N3NGE,	AM6155 repair.
Al	N3ITT,	222 transverter, checkout, 2m-28 low level board checkout and repair.

The following provided many hours of technical help during both sessions, and in addition, completed several projects on their own time: Phil, WA3NUF, Paul, WB3JYO, Pat, WB3DNI, Dave, WA3JUF, and John, KB3XG.

I seem to be able to keep busy looking for that elusive component and providing coffee. Dave, WB8ZAR, provided liquid refreshment for both sessions.

At this time, no more sessions can be scheduled here before the holidays. We are looking into having another gathering in the beginning of January, 1995, perhaps in a more central location. This may seem close to the contest, however, it will provide a last chance for checkout of current uncompleted projects and problems with equipment. If anybody feels they have room for an activity like this, PLEASE contact Paul or myself so we can schedule sessions for the spring of 1995. The test equipment should not be problem, as there are several individuals who can get it to a location for a day of hamming!

JANUARY CONTEST UPDATE II - CRUNCH TIME

By: Al, N3ITT

Well the frost is off the pumpkin by now, cause they've been turned into pie. Wise Pack Rats should heed this sign as, the final call to dust off that equipment and prepare to GIRD our GRIDS for the BIG ONE! Yes, the January contest is only weeks away. I hope by now that you have filled out your questionnaire and returned it to me. Already, I have been able to help several Rats find equipment or help they needed from info on the returned questionnaires! Many thanks to those of you who have lent help or equipment to fellow club members. I hope the "help" list worked for some of you.

At this time, I would like to take a moment to urge EVERYONE who can to attend the December Strategy meeting. Perhaps you can pick up some good tips, or last minute help. Better yet, why not share your experiences in contesting to help others. Either way, your attendance and participation is encouraged! At this time, it looks as though we will have a tough time getting 51 logs to enter the Unlimited Club category, so I'm counting on everyone to get on, do their best and submit a log. Contact Walt, WA3AQA to see if you need another club activity to be eligible to submit a log.

OK, well I won't hold you up any longer reading this stuff - we've all got work to do!!

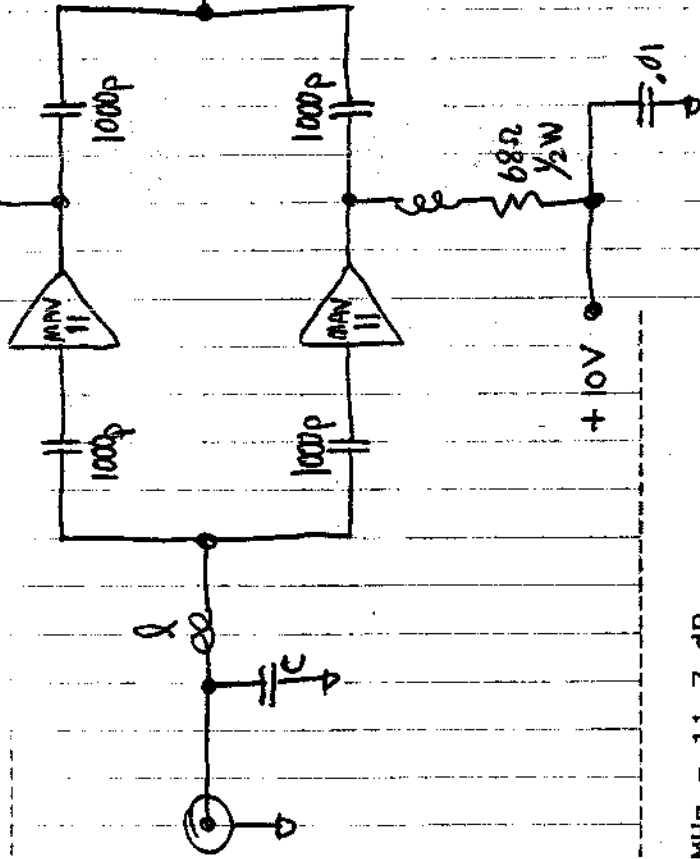
73 and CU on the Bands

SWAP SHOP

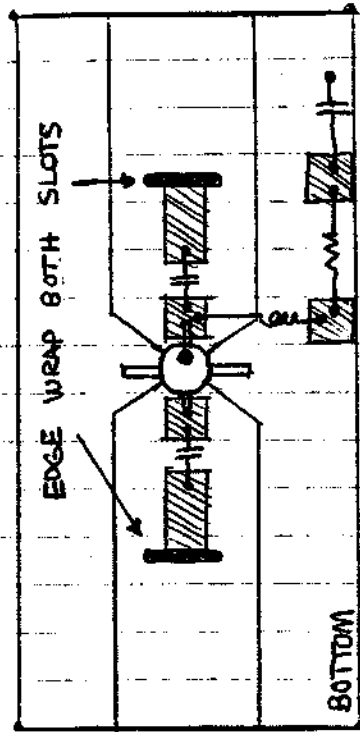
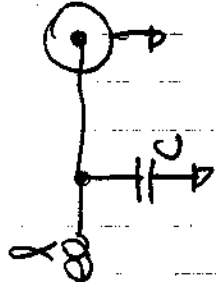
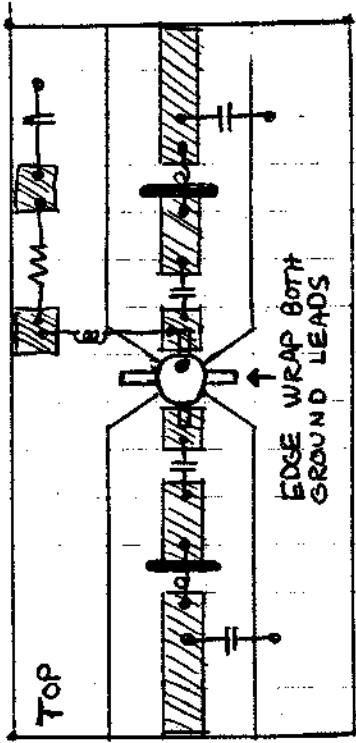
(send all ads to the editor)

FOR SALE: 1296 Power Amps, 250 watts to 750 watts, 2, 4, and 6 tube cavities using water cooled 7289, 8907 or single tube cavities using TH308, 328, 338 or water cooled Y730. Call or write to Tom Dinyovszky, KB2AH, 405 Union Lane, Brielle, NJ, 08730, 908-223-5067.

band MHz	cap pF	ind nH	# turns	coil dia.
50	56	100	5.5	3/16"
144	22	30	3.0	3/16"
222	15	18	3.5	3/32"
432	8.2	12	3.0	3/32"



gain @ 400 MHz = 11.7 dB
 1 dB bandwidth = 100 MHz
 1dB compression = +22 dBm
 3rd order intercept = +35 dBm
 2-tone test = -50 dBc, +10 dBm each tone



Index of Technical Articles in past issues of Cheese Bits

by Dave, WA3JUF

<u>Issue</u>	<u>Subject</u>	<u>Author</u>
Jan 1992	50 MHz Receive Converter	WB3JYO
Feb 1992	Microwave Frequency Stansard	K0KE
Feb 1992	Pin Diode IF Switch and Attenuator	WB5LUA
Feb 1992	New Twist in Microwave Transverter	WA5VJB
Mar 1992	902/903 MHz DL6WU Yagi Match	N3CX
Apr 1992	Relationship of Sensitivity and NF	KB3XG
May 1992	24 Volt DC/DC Converter	GW4LXO
Jun 1992	The Strength of Masts	N3AOG
Jun 1992	20 Watt 903 MHz Linear Amplifier	WA3JUF
July 1992	Andrew Coaxial Cable Information	Andrew Corp.
Jul 1992	Mods for the SHF Systems 540 MHz LO	WB3JYO
Aug 1992	Mixer/LO Mod for the 903 MHz no-tune xvtr	N3CX
Oct 1992	3456 MHz Isolator/Circulator	WA3JUF
Nov 1992	A "Crunch-Proof" 144 MHz Receive Converter	WB3JYO
Nov 1992	144 MHz GaAsFET Preamplifier	G1WBZ
Dec 1992	144 MHz Local Oscillator	WB3JYO
Dec 1992	1 Watt 2304 MHz Linear Amplifier	WA3JUF
Dec 1992	Hybrid Power Splitters	WA3IAC
Dec 1992	Plumbing Parts as 7/8 Inch Hardline Connectors	WB9GKA
Jan 1993	High Performance 222 MHz Transverter I	N3CX
Feb 1993	High Performance 222 MHz Transverter II	N3CX
Feb 1993	28 MHz Low-distortion Post Amplifier	WB3JYO
Feb 1993	2 Meter IF Load/Attenuator	WA3JUF
March 1993	Motorola Impedance Matching Program	Motorola
March 1993	A No-Tuning Power Fet Pre-Amp	G4SWX
April 1993	Intermodulation Distortion	N3CX
Apr 1993	High Performance 222 MHz Transverter III	N3CX
May 1993	A Solid State 6 Meter Amplifier	Motorola
May 1993	Phase Lock Loop Source Modifications	WA3JUF
May 1993	DJ9BV 144 Yagi Designs	DJ9BV
June 1993	Waveguide Data	
Jul 1993	144 MHz no-tune Preamplifier	G4SWX
Aug 1993	Tests on the NE/SA600 NEC IC	WA2OMY
Sep 1993	28 MHz Low-distortion Post Amplifier	WB3JYO
Oct 1993	A 144 MHz Preamplifier	WB3JYO
Nov 1993	Push-Pull Mosfet Power Amplifiers	WB3JYO/KB3XG
Dec 1993	144 MHz Band Pass Filter	WB3JYO
Jan 1994	IF Switching	WA2OMY
Feb 1994	DC/DC Converter	WA6CGR
Feb 1994	A 144 MHz Transmit Converter	WB3JYO
Mar 1994	Hints & Bits - Power Output Monitoring	WA3JUF
Apr 1994	Gary's Test Equip. Corner / Power Meters	WA2OMY
Apr 1994	144 MHz Transmit Mixer	WB3JYO
May 1994	Hints & Bits - Coaxial Antenna Relays	WA3JUF
May 1994	Hints & Bits - Driving Solid State Amps	WA3JUF
Jun 1994	144 MHz 2N3866 Linear Amplifier	WB3JYO
Jun 1994	6 Meteor Scatter	WB5KYK
Jul 1994	More Pipe Cap Mania	KB3XG
Jul 1994	144 MHz SD1273 Linear Amplifier	WB3JYO
Aug 1994	Signal Generators	WA2OMY
Oct 1994	Some Thoughts on 432 Meteor Scatter & Shower Data	WB5KYK
Oct 1994	Using the HP8761A Relay for a T/R Switch	WA3JUF
Oct 1994	Power Supply and Control for DEM No-Tunes	WA3JUF
Nov 1994	Hints & Tips For Tower Mounting	N1DPM
Dec 1994	Parallel MMIC's	KB3XG
Dec 1994	Hints and Bits: Building Transverters	WA3JUF

Note: The last index appeared in Dec 1991 Cheese Bits

SWAP SHOP Contd

FOR SALE: HP 3466A Autoranging multimeter, \$100, TEK 2235 100 MHz Scope, \$300, Seagate 130 MB Hard Drive, \$75, 386DX33 Motherboard, \$30, 2 ea Data Translation DT2801 A/D I/O Boards, 16 analog inputs @ 12 bits, 2 analog outputs @ 12 bits, 16 Dig I/O lines, @100, Hustler G6-440 vert., 6 dB gsin, \$30, AM-6154 on 432 MHz with relays, \$350.00. Contact Steve, WB3GRW at 215-249-9352.

Free - Don't pass up a bargain: Polarad TSA Spectrum Analyzer, 10 - 1000 Mc with a spare mainframe. Call Harry, W3IIT at 610-584-4846.

Wanted: Student or better microscope, 600X, with turret-mounted objectives, etc. Also, a 6 inch or better reflector telescope with eyepiece, optics, etc. And a 3 ft. dish with a f/D of .45 through .6. Call David, N3CX, at 215-679-7293 (H) or 215-483-2030 (W).

For Sale: HP 608D Signal Generator, 10-430 MHz \$60.00. Contact Gary, WA2OMY at 610-539-6409.

Wanted: 2 Meter multimode rig, 10 to 25 watts output. Call David, N3CX, at 215-679-7293 (H) or 215-483-2030 (W).

For Sale: AIL Model 74 Automatic Noise Figure, needs some work. Includes UHF, 07049 and 07050 waveguide no noise sources and HV supply and manual., \$100 OBO. Second UHF source for \$15.00. Call Harry, W3IIT at 610-584-4846 or hbrown@resd.vf.ge.com.

UPCOMING PROGRAMS

By: Gary, WA2OMY

December: Contest Preparation

January: Station Slides, Photos

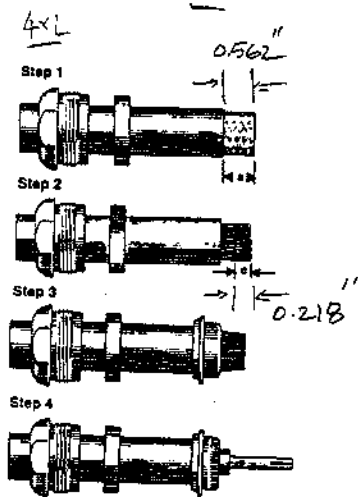
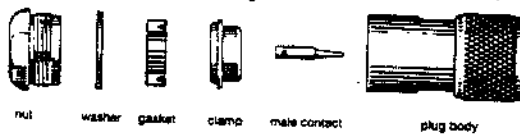
February: Contest Crying Towel Session

March: Annual Homebrew Night

Instructions for assembly of Flexible 9913 coax and Type N Connectors

from The R.F. Connection Handbook

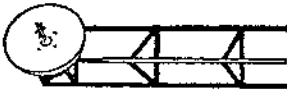
Type N assembly instructions



CLAMP TYPES

- Step 1 Place nut and gasket, with V groove toward clamp, over cable and cut off jacket to dim. a.
- STEP II STANDARD CLAMP (8216/11)
PLACE NUT, WASHER AND GASKET TOWARD CLAMP, COMB CABLE AND CUT OFF JACKET TO DIM. A
- Step 2 Comb out braid and fold out. Cut off cable dielectric to dim. c as shown.
- Step 3 Pull braid wires forward and taper toward center conductor. Place clamp over braid and push back against cable jacket.
- Step 4 Fold back braid wires as shown, trim braid to proper length and form over clamp as shown. Solder contact to center conductor.
- Step 5 Insert cable and parts into connector body. Make sure sharp edge of clamp seats properly in gasket. Tighten nut.

A Call for Action by Amateurs!!



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November 17, 1994

To: ALL AMATEURS CONCERNED ABOUT THE FUTURE OF THE MICROWAVE BANDS

From: David E. Leag, President
San Bernardino Microwave Society

Dear Fellow Microwaveer,

The FCC has just released its *Proposed Rule Making (NPRM)* regarding the disposition of three segments of the 13 cm¹⁾ Amateur band. This NPRM, entitled "ET Docket No. 94-32", or "94-32" for short, was adopted October 20, and released in written form on November 8, 1994. It contains a public comment period ending December 19, 1994, with a reply comment period ending January 3, 1995.

Should you comment at this time? We believe that the answer is yes! The NPRM sets the rules under which two segments, 2,390 through 2,400 and 2,402 through 2,417 MHz, will be taken away from the Amateur service. Additionally, the NPRM requests comments on how the third segment, 2,300 through 2,310 MHz, should be used in the future.

We have included a copy of our filing made to the FCC earlier this year. It may be used as a rough guideline as to how you might prepare a response. Any response should address some or all of the following issues:

- a) How you use the 13 cm band.
- b) How your use, or the use by others, of the 13 cm band benefits the public.
- c) Why taking away certain band segments will adversely affect the Amateur service.
- d) What financial loss would you incur if any segments are taken away.
- e) Why the proposed new services in these bands might not be in the best public interest.
- f) Whether or not you believe that the FCC or NTIA has fulfilled their obligation as directed under the "Omnibus Budget Reconciliation Act of 1993".
- g) In paragraph 20 of the NPRM, the FCC asks for specific responses to:
 - 1) "One approach for accommodating Amateur service use of these bands is to maintain a secondary allocation for the Amateur service in all or part of this spectrum."

2) "Another approach is to make the Amateur service the primary user in a portion of this spectrum while either maintaining a secondary allocation in the remaining portions of the bands or eliminating the other portions from the Amateur service."

3) "We also solicit information on the degree of disruption to the Amateur service that would result if all or part of this spectrum was removed from the Amateur service."

4) "We request comments on these options, including the ability of various radio services to share spectrum with the Amateur service."

You comments should contain well thought out arguments for or against the items indicated above. Do Not berate any employees of the FCC, NTIA or Federal Government in general, as they have been saddled with a very difficult task of trying to protect the interests of all parties involved. Our comments will do the most good if they enable the FCC to protect our bands by showing good cause as to why we should keep them.

If you would like a complete copy of the NPRM to assist you with developing your comments, contact the SBMS, ARRL or FCC with your request. A number of west-coast groups will again be commenting, and sharing of comments ahead of time can be quite helpful.

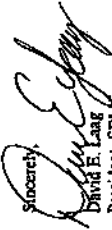
When finished, file your comments (one original and four copies²⁾) with:

Office of the Secretary
Federal Communications Commission
Washington, DC 20554

Attn: William F. Caton,
Acting Secretary

It is advisable that you use a mail or parcel service requiring that your comments be signed for. If you have enough time, use registered or certified mail. If you are short on time, use express mail or one of the overnight parcel services.

It is important that you file comments. While you may not dramatically change the course of this current action, the fact that a number of interested Amateurs filed intelligent and meaningful comments on this matter sends the message that we really do care what happens to our bands!

Sincerely,

David E. Leag
President, SBMS

1) The 13 cm band currently covers 2,300 through 2,310 and 2,390 through 2,450 MHz. The segments under attack here are 2,300 through 2,310, 2,390 through 2,400 and 2,402 through 2,417 MHz.

2) You may have a copy of your comments given to each Commissioner by including nine copies with your original copy. This is recommended if you have the resources to do so.

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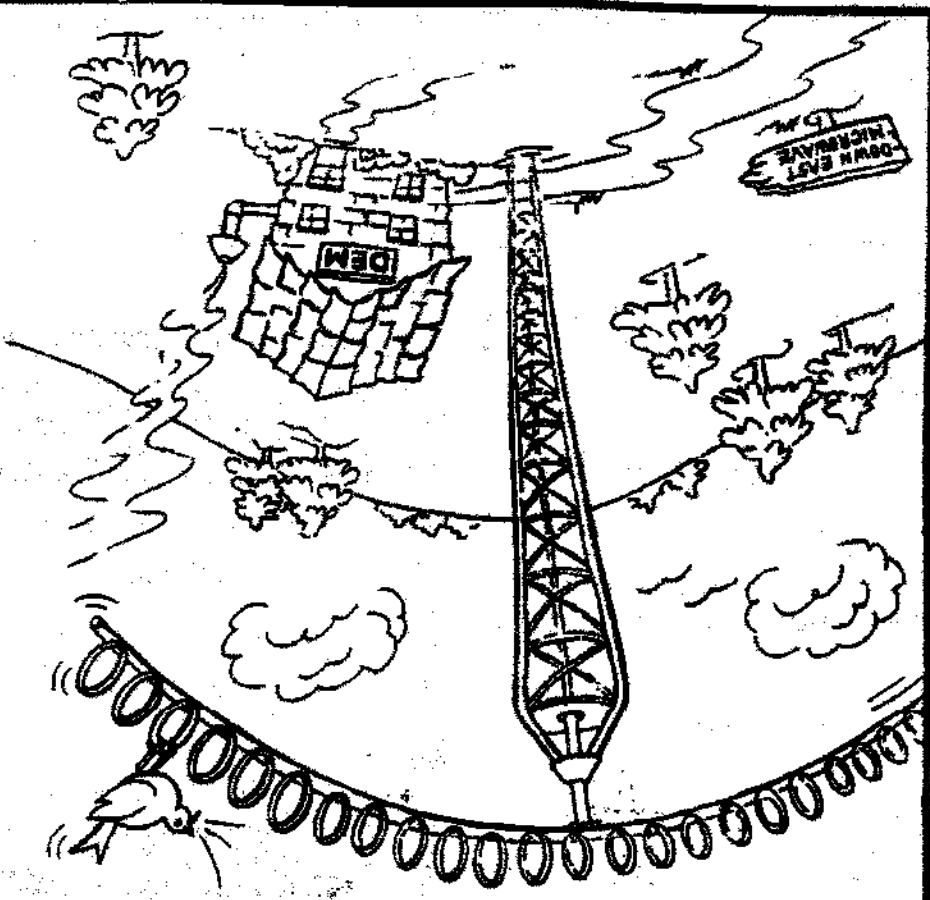
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Bob Fischer, WB2YEH
7258 Walnut Avenue
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(609) 665-8488

EDITOR:

Harry Brown, W3IIT
3012 Potshop Road
Norristown, PA 19403
(610) 584-4846
hbrown@resd.vf.ge.com

CLUB TREASURER:

Dave Mascaro, WA3JUF
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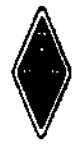
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8:30 PM	224.58R MHz	K3ACR
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