

CHEESE BITS



W3CCX

CLUB MEMORIAL CALL



ARRL
Affiliated
Club

VOLUME XXXV

January 1998

Number 1

THE PREZ SEZ

Another 12 months down the tubes. It hardly seems possible that another whole year has passed by the wayside. The Pack Rats, however, have been very busy. We often get labeled as just a contest club because of our outstanding record in the January Sweepstakes, but the Pack Rats are so much more. Above all we are a "Club" in the true sense of the word.

To start with last year the club pulled together once again and won the Unlimited Club competition in the 1997 January Sweepstakes for Gavel number 36. We do take that event very seriously, but we did a whole lot more. We had our traditional crying towel meeting in February where everyone got to tell their tale of woe and what shoulda, coulda woulda been if fate hadn't dealt them such a cruel blow during the contest. The March general membership meeting featured the very popular Home Brew Night where members prove that the ancient art of homebrewing equipment is still alive and well. The spring season brought our annual banquet and awards night followed closely by the June Contest and then the Pack Rat Picnic. We had a speaker down from the League in May. The Hamarama and VHF Conference took place in the fall. Jim, WA3EHD had many fine speakers for the regular club meetings. In between all this we managed to add three new beacons to the microwave bands. planned for three more beacons on the three lower bands, we purchased a load of coax and connectors at a good price for any member who wanted some, we kept our Web page up to date, we now have two e-mail reflectors, we have an excellent award winning newsletter and we even find time to get on the air once in awhile. Membership increased substantially thanks to the efforts initiated by the past president, WA3NUP. A few more people stepped up and said 'what can we do' for the club, instead of 'what are they doing'. It was a good year. You should be proud of your contributions.

Well we have come full circle and it's time to once again support your club in the 1998 January Sweepstakes. This is it. It's time to stand up and be counted. **No excuses.** Your club needs your participation and support to win another gavel. That's one of the reasons why you have all that equipment, right. It's unfortunate that some of you are just a 'once a year' ham. But if you are only going to do it once a year, then this is your time to shine.

AA2UK has been doing an excellent job of getting this effort organized, but he can't do it by himself. He needs our help. We have serious threats to our position as top dog. A winner, and their winning score, is always the target that other competitors use to measure their progress towards knocking us off the throne. So every year, if we want to stay on top, we have to do better than the previous year. The challengers will always try to beat our last years score and figure if they can do that they have a good chance of winning. And they will if we lay down and don't improve. I mentioned above that we have 36 gavels. That's the good news. The reality is that we should have 37, but in 1993 we let up for a minute and it was gone in the blink of an eye. The spirit of W3CL is watching from above. Lets not disappoint him again.

73, Ron, W3RJW

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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MONDAY NIGHT NETS

<u>TIME</u>	<u>FREQ.</u>	<u>NET CONTROL</u>
7:30 PM	50.150 MHz	K3EOD
8:00 PM	144.150 MHz	N3ITT
8:30 PM	222.125 MHz	W2SJ/N3EXA
8:30 PM	224.58R MHz	W3GXB
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: N3ITT 610-847-5490
 HAMARAMA: N3EXA 215-257-6303
 VHF CONFERENCE: KB3XG 610-584-2489

PACK RAT BEACONS - W3CCX/B FM29JW

432.298 MHz 903.071 MHz
 1296.262 MHz 2304.034 MHz


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CONTEST LETTER

By: Bill, AA2UK, 98 CONTEST CHAIRMAN

Well it's that time of year again gentlemen. Its the time to get the dust out of those amplifiers, blow up those dry electrolytics in high voltage supplies and check the rain gauges, I mean feedlines and connectors. The Packrat machine is in full swing. There is no turning back, just forge ahead. Our opponents are ready to strike and can smell blood.

There is still time to ask for help but you do have to ask. Many stations have already asked for assistance and received it. Thanks for the overwhelming response to the questionnaires.

On any given night you can hear the activity, stations testing or looking for tests on the club repeater. Many Rats are getting on new bands. The big question you can ask yourself is have I done all I can do to support the Club in the contest? See you in the QRM.

CALENDAR OF COMING EVENTS - JANUARY 1998

- 1 Only 17 days left until the 1998 January Sweepstakes. New Years Day
- 4 Predicted peak of the Quadrantids meteor shower.
- 8 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.
- 15 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.
- 17-19 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.
- 22 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.
- 25 Maryland Mobilizers ARC Post Holiday Swapfest and Flea at Odenton Vol. Fire Dept. Hall in Odenton, Md. VE Exams. TI on 146.205/805.
- 31 Contest Log Wran-Up Session at the QTH of Bob, W2SJ. Get your log to your contest coordinator or to Bob ASAP. Session starts at 10 AM. Call Bob at 609-665-8488 for directions.

NEW PACK RAT BEACONS

Ron J. Wlitsel, W3RJW (ex W3AXV)

Three new Pack Rat Beacons were installed and turned on by our Chief Field Engineer (N3DQZ) at high noon yesterday, 12/16/97. Large signals were heard at AA2UK, N3AOG and W3RJW. Pass the word.

W3CCX/B

3456.220 MHz 5 watts to 16 Slot Waveguide Antenna
5760.200 MHz 5 Watts to 32 Slot Waveguide Antenna
10368.200 MHz 0.5 Watts to 32 Slot Waveguide Antenna
FM29JW, Center City, Phila., 500 feet above street level.

Other W3CCX/B Beacons 432.295MHz 903.072MHz 1296.251MHz 2304.037MHz

6 METER BEACON. Well, We added another one to the list today! A Six meter beacon is now active on 50.080 MHz from the center city Philadelphia location. The beacon is running 4 watts thru 40' of 9913 to a "Saturn 6" halo antenna. The keying of the beacon is synchronized with the other 7 beacons. Send your propagation reports and comments or complaints to the Prez, W3RJW. I would like to thank the following people for help and encouragement in getting the 6 meter VHF beacon built and on the air: Steve Dallas, WB3KRW.

222 BEACON. The 222 beacon went on the air today around noon from the center city Philadelphia location. The beacon is on 222.065 MHz, running 5 watts into a halo, keyed in sync with the other 8 beacons! Only one band left to go for a clean sweep! Taxs goes out to the "Steves" WB3KRW for equipment donation and help, and N2CEI for the antenna donation.

Let me know if you are hearing any of the new beacons.

TID BITS

THE 222 PACK RAT REPEATER NET WILL BE OPERATED ON 223.5 SIMPLEX FOR THE NEXT TWO MONDAY NIGHTS, JANUARY 5, AND JANUARY 12. K3EOD WILL BE THE NET CONTROL STATION FOR THESE TWO NETS ONLY. BOB W3GXB WILL MAKE THE ANNOUNCEMENT AT THE START OF THE NET EACH WEEK. THANKS. AND HAVE A HAPPY NEW YEAR. AI. K3EOD

6Meter SSB NET FN42. We have a SSB net on 50.275 Sunday morning's 14:30Z in Boston, MA area FN42. The net is informal, mostly to see who we can hear and to get everyone operating at the same time. Feel free to join us! 73. N1VHL

New Packrats: Dennis Gazak, N3DG, 1171 Huntingdon Pike, Huntingdon Valley, PA 19006, 215-938-8820, N3DG@juno.com and Rick Rosen, K1DS, Lower State Road 1483, North Wales, PA 19454, 215-793-9306, K1DS@juno.com.

1997 VHF+ GRAND-SLAM FINAL STANDINGS - TOP 25

By: JEROME, K3GNC

STANDING	CALL	JANUARY	JUNE	AUGUST	SEPTEMBER	AVERAGE
1	WA8WZG	467.712	395.031	237.930	394.744	373.854
2	WA2TFO	364.000	350.058		329.732	260.948
3	K1RZ	188.649	243.698		258.128	172.619
4	KD1DU	170.291	135.564	59.598	181.712	136.791
5	KE8FD	167.800	160.160		213.428	135.347
6	W3OR	139.503	171.193		129.540	110.059
7	WA2FGK	101.34		108.225	196.910	101.620
8	WB2DNE	101.475	109.740		127.303	84.630
9	AA2UK	231.972			106.215	84.547
10	K2UOP/8	81.270	117.025		137.592	83.972
11	W1VT	25.168	107.136	69.864	99.064	75.308
12	W5ZN		288.320	5.220		73.685
13	WC2K	276.937				69.234
14	K2YA2	54.864	101.752	16.848	98.645	68.027
15	W3RJW	262.080				65.520
16	AA9AO	81.357	61.017	9.720	92.535	61.157
17	N2CEI		225.862			56.466
18	WA0BWE	50.688	54.404		118.080	55.793
19	WZ1V	222.384				55.596
20	K8MD	25.168	69.080	9.348	99.064	50.665
21	W2FU	188.800				47.200
22	N2BJ	149.641		38.130		46.943
23	N3NGE	51.821			97.149	45.886
24	WA3NUF	177.862				44.466
25	K8TQK	36.059	107.100	26.289		42.362

ATTENTION!! ATTENTION!! IF THE 'AVERAGE' OF YOUR SCORE IN THE 4 MAJOR VHF+ CONTEST IS GREATER THAN 42.362, THEN LET ME KNOW AND I WILL INCLUDE IT IN THE NEXT RELEASE.

SWAP SHOP:

(send all ads to the editor)

FOR SALE: 2 meter homebrew plumber's delight amp. Uses a pair of 4cx250 type tubes, with 2500 volt power supply. Asking \$700. Also, have 432 mhz. ARCOS amp. Uses a pair of 8930 type tubes, with power supply. Asking \$1100. Plus shipping on both. Call 302-337-7966 or email if more information is needed. 73. Rick/KB3PD

FOR SALE: TS830S 160-10 meter digital transceiver with WARC, owners/hcxh manual and box, excellent condition \$525, Jim, W3FIE 215-342-9343.

FOR SALE: HAL DSR2000 CW/RTTY/ASCII Keyboard with memories, buffer, manual. \$60 or trade, Dennis, N3DG 215-938-8820.

WANTED: Yaesu SP767 Speaker, Radio Shack HTX100 10 meter transceiver, Ameco AC-1 transmitter, Heath HW8, HW9 QRP transceiver, Yaesu FT736R with all modules, Kenwood TM631 2/220 transceiver or triband mobile, Alpha HF amplifier. Contact: Dennis, N3DG, 215-938-8820.

Modification of the AM6154-6155 for 432 MHz

by

Ron Whitsel, W3RJW

It seems the modifications to the venerable Fair Radio FAA amps for use on 432 has been lost in space. Following are the modifications required to make either of these units work on 432 MHz. There are two keys to a successful 432 modification: 1). Remove the original grid circuit components completely and install a hobby brass stripline in its place and 2). Use a Teflon "cocoon" to insulate a new RF choke that must be installed in the plate circuit. Save yourself some time and trouble (Trouble Defined As: Massive quantities of black, sooty carbon material fused to the inside of the plate cavity resonator caused by the catastrophic disintegration of the plate choke and the non-Teflon insulator.); Teflon tape doesn't work, heat shrink tubing doesn't work - a hollow Teflon cylinder does work.

The basis for these modifications were originally described by WA5VJB in the November, 1985 issue of "VHF/UHF and Above". A follow-up article by K0TLM in 1985 (VHF/UHF and Above?) solved the grid circuit problem. The information presented here borrows the best from both articles, adds some new ideas and attempts to describe all the information you will need for a successful conversion in one place. One of the major weak points of all the original conversions was the plate choke insulation. The technique described here solves that problem. A lathe is required to manufacture the Teflon plate choke insulator. A small hobby lathe such as a Unimat will do the job. I haven't found any way around the insulator fabrication requirements and the Teflon insulator is absolutely essential to make this conversion work. I have personally modified about dozen 6154/55's over the years and all work well. 12-15 watts of drive will produce 400 to over 500 watts of output depending mostly on the condition of the tube.

The power supply modifications have been well documented. Be sure to replace R1 and R2, 1/2 watt 10 ohm high voltage power supply resistors, with 2 watt 10 ohm resistors and use a heavy gauge wire to ground the ends of these resistors. I would also recommend that you run any of these amplifiers on 220 VAC, particularly a 432 unit which tends to draw a little more current because of reduced efficiency of the cavity at this frequency. The rest of the power supply conversions will not be given in this article.

Getting Started:

1. Remove the RF plug-in from the chassis and remove the tube, the Teflon chimney and the plate ring by unscrewing two screws that attach it to the high voltage side of the plate bypass capacitor. Leave the plate side of the tube compartment alone for the moment and turn the unit over exposing the grid side of the compartment.

2. Remove the following components:

AM-6154

C2 - Input Loading Cap. shaft and gears

R1 - 47K 1/2 Watt Input to ground

C3 - 15pf Grid Line to Grid

C5, C6, C7 - 6.8 pf Caps

L1, L2 - .22 µh RF Choke and Bead

E1 - Spark Gap

External Bandpass Filter

R2, R3, R4, R5 - Remove 20 ohm Cathode Resistors & Solder Cathode Pins to Ground

AM-6155

C2 - Input Loading Cap. shaft and gears

C3 - 3.3 pf Grid Line to Grid

L1, L2 - .22 µh RF Choke and Bead

E1 - Spark Gap

External Bandpass Filter

3. Remove the small "c" clip from the shaft of the grid tuning capacitor. The clip is located at the gear end of the shaft, near the front panel. Also, loosen the set screws that hold the gear to the shaft. Removing the clip and loosening the gear will allow you to slide the whole shaft assembly forward, through the gear, far enough to disengage the shaft from the black coupling tube that connects the drive shaft to the tuning capacitor shaft.

4. If you have removed all the components listed above and completed step 3, you can now remove the entire grid compartment by removing the four screws that hold it to the main chassis and remove the two screws that hold the feedthru capacitor plate to the grid compartment. Leave the feedthru capacitor plate where it is as you lift up and remove the entire grid compartment.

5. Unsolder the tuning capacitor (C1) rotor from the grid line. Unscrew the nut that holds the tuning capacitor to the side wall of the compartment. Remove the capacitor and set aside, this will be modified and reinstalled.

6. The input pedestal inductor has to be removed from the input cavity. This can be a real bear depending on the state of the set screws that hold the pedestal to the cavity at the cold end. Extreme cases require drilling out the set screws. Once the set screws are loosened, slide the pedestal out of the cavity and unscrew at the thread joint. Saw off an inch or so of the grid line to put back in the hole where the set screws are located. Plug the hole and tighten the set screws. The only component remaining in the grid compartment at this point should be the TNC RF input jack.

This completes the removal process. It's now time to prepare for the new parts process.

7. Modify the old tuning capacitor by removing about half the plates on either the stator or rotor. This is not absolutely essential, but makes the tuning less "sharp". I have a hand saw that I use to carefully saw off the stator posts so that 3 or 4 of the stator plates remain. A sharp hack saw can be used very carefully. Another alternative is to replace the capacitor with a small value model with about 3 or four plates. These miniature variables used to be quite popular for the "6360" AM rigs that were in the old ARRL handbooks. Usually available at Hamfests for cheap. Whatever method you use, make sure to check the capacitor for shorts between the stator and the rotor. You can see how close the plates are together. Rotate the capacitor through its entire range while looking for shorts with an ohm meter.

8. Reinstall the modified capacitor (C1) in its old spot in the grid compartment. Install a 200 pf silver mica capacitor from the grid bias input (C4) to ground (rim of tube socket). Reinstall the entire grid compartment. Push the shaft back into the coupling and put the 'C' clip back on the shaft, tighten the set screws in the gear hub, and check that turning the input tuning control turns the capacitor. It wouldn't hurt to check for shorts again.

9. Cut out the new grid line and bend to shape according to Figure 1 and Figure 2. Nothing is really critical here so don't spend a lot of time agonizing over the dimensions. Things can be fitted and trimmed as necessary when installing.

Now comes the fun part:

10. Position the new grid line inside the grid compartment level with the tab on C1 and solder at three points: the grid bias feed through capacitor (C4), the tuning capacitor (C1) and to the tapped connection from the grid line to the tube grid connection. The C4 and grid tap connections are made with small strips of brass material. Install another 200pf silver mica from the RF input to the tap point on the line. See Figure 2.

Back to the Plate compartment:

11. Remove the two screws that attach the ends of the high voltage capacitor plate assembly to the two vertical insulators on either side of the plate line. Next remove the two screws that attach the capacitor plate assembly to the plate line. Make sure you remember which screws go where.

12. Remove the high voltage side of the bypass capacitor plate by heating the nipple in the center of the plate with a soldering iron and at the same time apply steady pressure to pull the assembly free when the solder melts. Remove the Kapton (?) (Orange film) or Mica dielectric material and the small Teflon bushing that the high voltage wire passes through. Remember the orientation of the bushing. Place the parts in a clean, safe location.

13. Manufacture the plate choke insulator as shown in Figure 3.

14. At the front-panel end of the cavity, unsolder the high voltage lead from the feed through capacitor. Make sure the cavity band change "switch" is in the "VHF" position. Remove the post (mounting plate to front panel) above the plate tuning counter and loosen the set screws on the plate tuning gear. Slip the tuning gear off its shaft and slide it on to the flexible tuning shaft to make room for the wrench in the next step. Put a wrench (1/2" cheap, stamped wrench works best here) on the feed through capacitor and start to loosen the capacitor. Once the capacitor is "broken loose", use the wrench to hold the feed through capacitor, and with the other hand grasp the plate compartment end of the plate line and start to unscrew the capacitor from the front end of the cavity. This is a little tricky the first time you do it, but be assured you will be able to "unscrew" the feed through capacitor from the front end of the cavity by turning the plate line at the other end (lots of turns). Once unscrewed, draw the capacitor and attached wire out the full length of the cavity.

15. Prepare an air wound choke from bare #20 wire that is 5 turns, spaced about one wire diameter, and has an ID of 7/64 inch (use a 7/64" drill bit). Leave about one inch of lead on one end and about 1/8 inch on the other end. Stretch out the feedthrough capacitor and attached wire to its full length. Mark the length from the shoulder of the feed through capacitor to the tip of the wire on the workbench top or a piece of cardboard (about 11.25 inches). The idea is going to be to try and match capacitor, wire and new choke assembly length to the original length of just the capacitor and wire. To do this lay the choke on the table with the long lead of the choke about an eighth of an inch past the total length mark. Tape the choke to the table or cardboard in that position. Now stretch out the wire and capacitor assembly again, position the capacitor in the same place as before and mark the wire for cutting at a point where it just overlaps the short choke lead. Cut the wire, strip the end and solder it to the choke. You should now have a capacitor, wire and choke assembly ready for insertion back into the plate line.

16. Slip the Teflon 'cocoon' over the choke all the way so the bare wire from the long lead of the choke sticks out through the end of the 'cocoon'. Insert the whole assembly, cocoon first, back into the plate line (see Figure 4.). Push it all the way in until you get to the point where the capacitor threads are ready to be screwed back into the front end of the plate cavity. Reverse the removal procedure and screw the plate line on to the capacitor. Once close to being tight, check to see that the two screw holes in the end of the plate line are parallel to bottom of the compartment (sight along the edge of the compartment). This takes some 'messing' around until you get the capacitor tight at the same time the screw holes are in the right position. The final tightening is accomplished with a wrench on the capacitor. Undershooting the final position of the screw holes and then turning the capacitor in the last little bit with the wrench sometimes works.

17. Remove all the solder from the center hole in the high voltage capacitor plate. This is accomplished most of the time by simply drilling the old solder out with a small drill bit (It's hard to get enough heat and suck solder at the same time).

18. Clean the end of the plate line, the dielectric disk and the backside of the high voltage capacitor plate with video tape head cleaner or 200 proof alcohol, something that leaves no residue. Make sure these parts are absolutely clean to prevent a stray particle from initiating a high voltage "punch through".

19. Place the small Teflon bushing back into the end of the plate line. If you have difficulty pushing this bushing all the way in (there will be some resistance), then the wire is probably a bit too long and must be shortened. Position the dielectric disk so that it is centered on the plate line with the tip of the bushing and wire protruding through its center. The screw holes in the dielectric disk must also be aligned with the screw holes in the end of the plate line. Place the high voltage capacitor plate over the wire and up against the plate line without moving anything (easier said than done). When every thing is back in place reinstall the two attaching screws to the end of the plate line. Reinstall other two screws in the vertical insulators.

20. Using a large capacity soldering iron, solder the choke wire to the high voltage capacitor plate nipple. Trim any excess choke lead. From the outside everything should now look just as it did before modification. Reinstall the plate ring and Teflon chimney and put the tube back in.

21. Put the cavity band switch in the "GHF" position. If you can't grid dip the input network, then preset the grid tuning capacitor to about the half meshed position. Preset the Plate loading capacitor to about half way.

Tune-Up

22. The moment of truth is here. Put the RF plug-in back in the chassis and turn on the power. Wait for the warm-up timer to time out and then turn on the high voltage. If there are no snaps, crackles or pops, all is well and right with the world. If not, then you have to open the patient back up and find out what's wrong.

23. Most all the units I have used want the plate tuning to be at about '157' to '159' on the plate tuning counter. This is the place to start.

24. Start with reduced drive, if possible (about 5 watts), and adjust the grid tuning for maximum current on the plate meter (Note: The grid tuning control will still be pretty sharp, even with the modified capacitor, so tune carefully and find the exact peak.). If you see power output at this point, then tune the plate for maximum output power. If you see plate current and no RF output then tweak the plate tuning and power should start to rise. Something should be happening at this point. If it's not, then step back for a moment and try to determine what might be wrong: Check the cables, any relays in the system or perhaps the drive is not what you think it is.

25. Raise the drive power and go back and forth between the plate tuning and loading controls to peak the power output each time you raise the drive (Note: The loading control is not that critical until you get near maximum power). Go back and touch up the grid tuning as power output starts to come up. Once some serious power starts to show (300 to 400 watts), I usually continue this procedure with an electronic keyer sending continuous dashes to reduce the power dissipation a little bit. The AM-6154/55 have a temperature shut down circuit so you will know if things get too hot. If the high voltage trips from over temperature, let it cool down (with the blower running) and then turn the high voltage back on in a few minutes. Do your tuning in short bursts. Give the tube a few seconds every now and then to get rid of some heat.

26. With 15 watts of drive and a good tube you should easily exceed 450 watts out. I would back it off a little to conserve both tube and power supply, but that depends on the depth of your pockets.

Checkout the Mt. Airy VHF Radio Club web page at: www://IJ.NET/packrats/

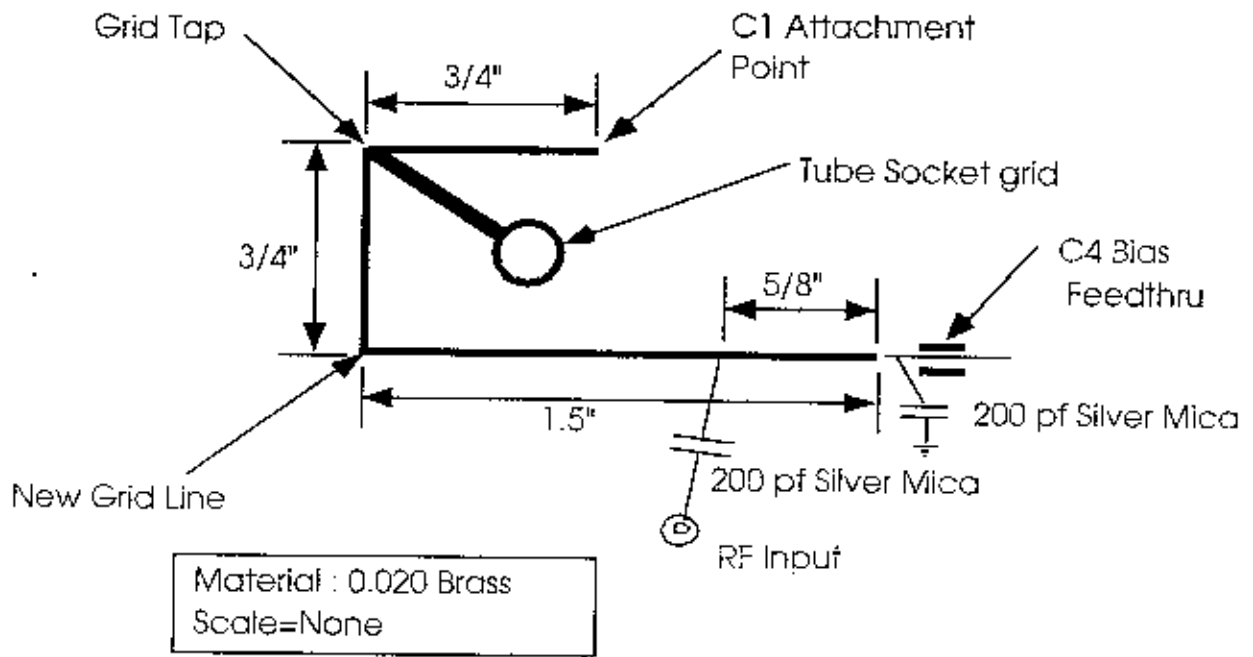


Figure 1. New Grid Line - Top Vie w

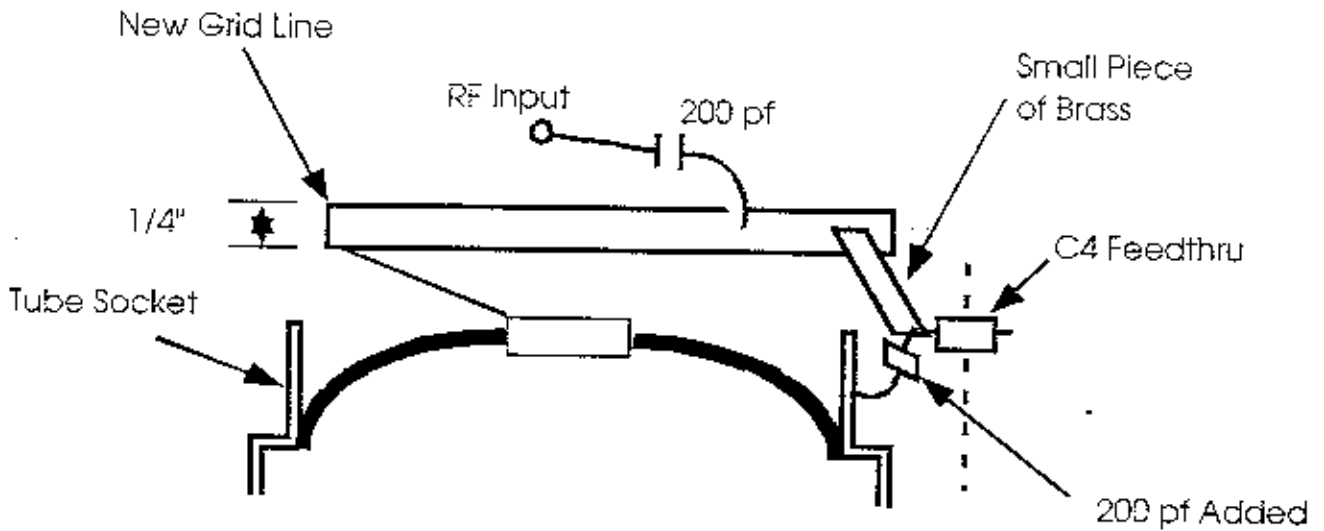


Figure 2. New Grid Line - Side Vie w

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Checkout the Mt. Airy VHF Radio Club web page at: www://IJ.NET/packrats/

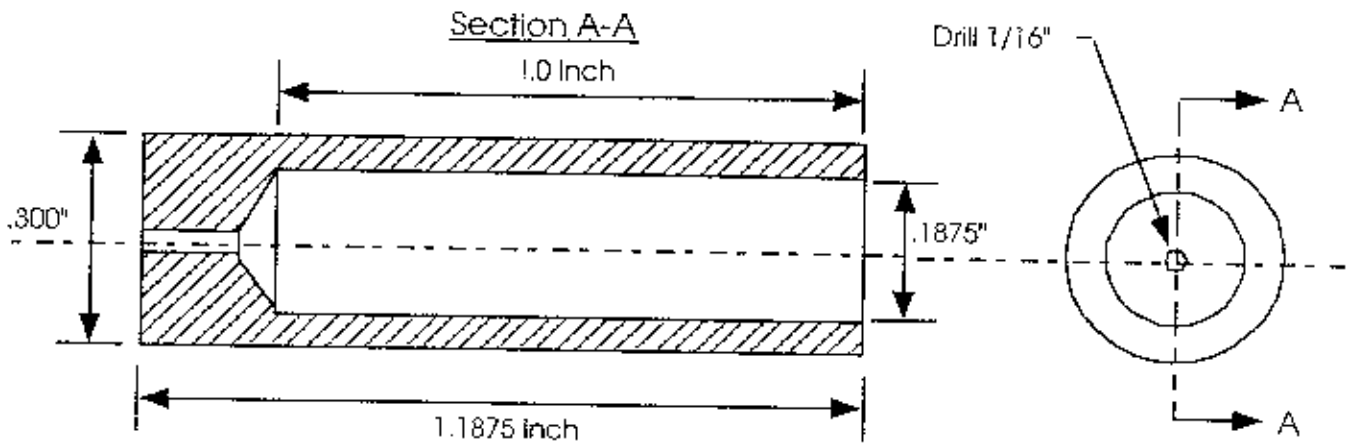


Figure 3. Teflon Plate Choke Insulator

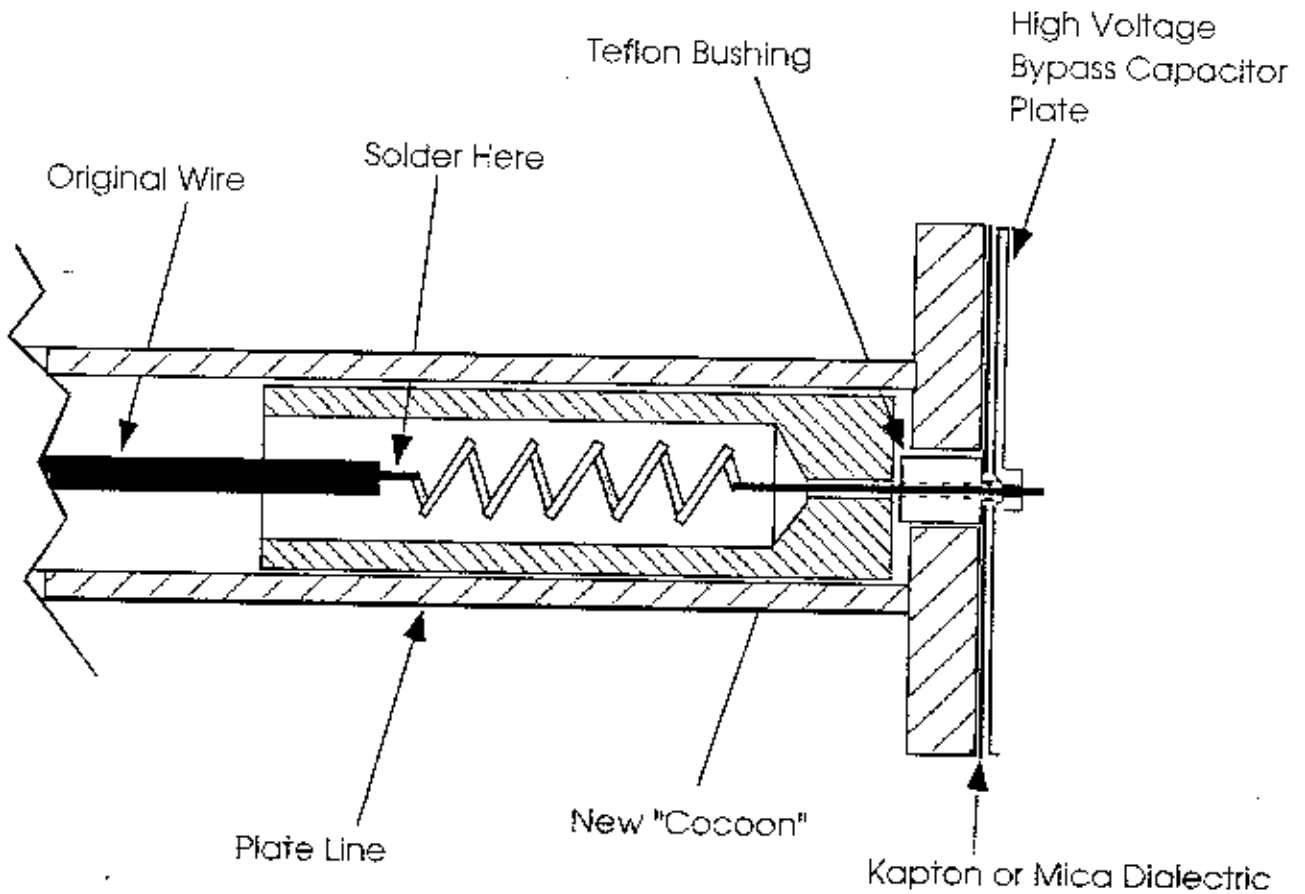


Figure 4. Plate Choke Insulator Installation

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Scale=None

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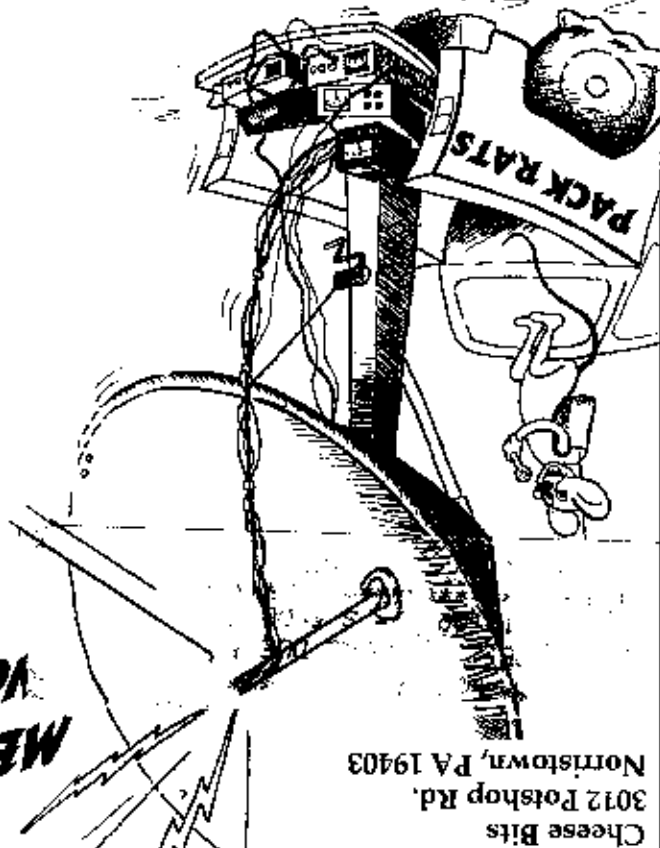
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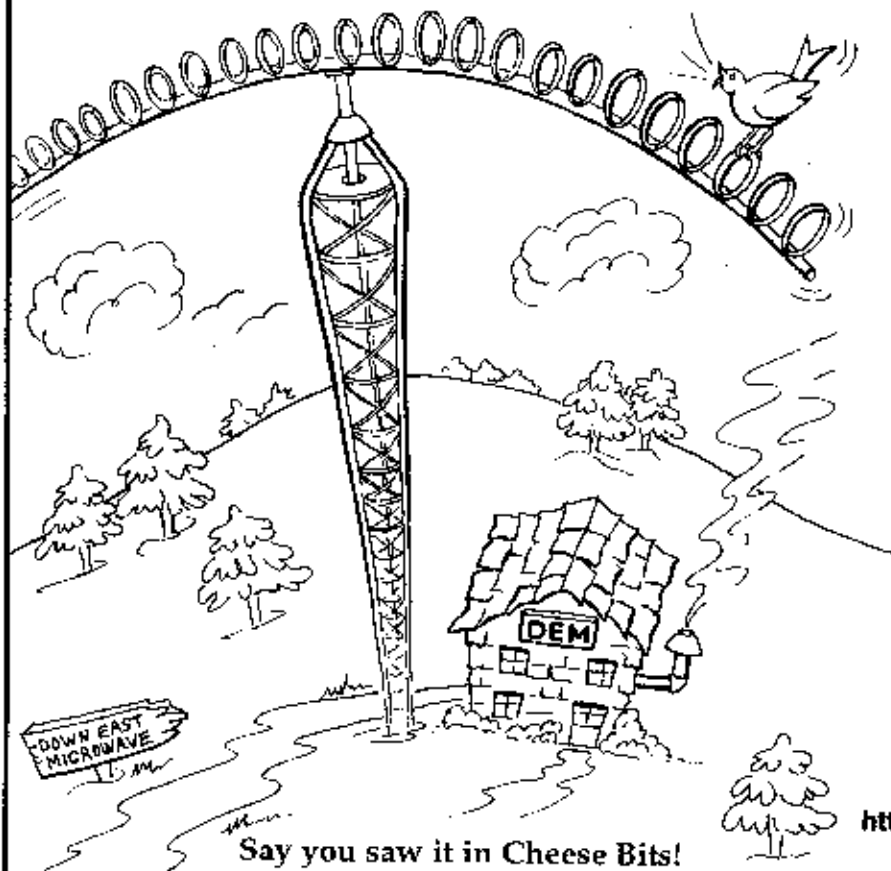
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