

CHEESE BITS



W3CCX

CLUB MEMORIAL CALL



ARRL
Affiliated
Club

SCANNED TO PDF BY BERT, K3HJV, 2013

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Number 12

THE PREZ SEZ

Can you believe its December already!? Where did the summer go? The holidays are fast approaching, then New Years and then the big event of the year - the January Sweepstakes. Are you ready? Do you have your two club meetings in for this year? Have you been on the air? Is the "stuff" working? Don't wait until two days before the contest to find out the state of your station. The very minimum you should be doing is checking in to all the Pack Rat nets. Find out what's working and what's not. Remember, AA2UK is watching you! This is the time of the year we find out who are the real Pack Rats!

I have found over the years that the "stuff" fails even when it's turned off! Must be one of those yet unexplained phenomena like UFOs and low loss coax. Don't assume that since the "stuff" was working on January 20th, after last years contest, that it is still working today. I'm telling you the gremlins never rest! They don't go to the islands for the winter. They are cozy and warm and live in your shack with their toady little feet propped up on your Kenwood's knobs. Can't you just see them there? Kind of a cross between Bruce and a pit bull! They eat diodes for breakfast and crunch Mimics for dinner. They snack on computer grade electrolytics and they mainline water into your coax. They smoke your transformers and belch on your GaAs Fets. Nasty little critters. Disinfect your shack. Turn the "stuff" on!

On a lighter note, the Pack Rat 3.4, 5.7 and 10 GHz beacons are very near to completion. Actually, as I write this (12/2/97) the 3.4 and 10 GHz beacons are humming away in my shack, undergoing final burn-in before shipping. The 5.7 beacon is not far behind. It won't be long now. We will get the final frequencies determined and let everybody know via E-Mail and the Pack Rat web page (www.ij.net/packrats) when everything is up and running. In case you have been out of the country for the last couple of years, the Pack Rats soon will have beacons on all amateur bands from 432 MHz to 10 GHz! Plans are loosely in the works to finish off 6 meters through 222 MHz next year (Lay down, Lay down! Maybe the thought will go away!). Maybe you want to help? Let someone know.

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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Southampton, PA

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PACKRAT 222 MHz REPEATER - W3CCX/R

222.98/224.58 MHz, Churchville, PA FN20LE

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	N3ITT	(1 YR) Al Sheppard
	N3EXA	(1 YR) Brian Taylor

MONDAY NIGHT NETS

TIME	FREQ.	NET CONTROL
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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CALENDAR OF COMING EVENTS - DECEMBER 1997

- 1 Only 48 days left until the 1998 January Sweepstakes.
- 5-7 ARRL 160 Meter Contest See page 94 of the Dec. issue of QST for the rules.
- 8 Check into the 2 Meter Net on 144.150 MHz at 8:00 PM EST.
- 8 Check into the 1296 MHz Net on 1296.100 MHz at 10:00 PM EST.
- 11 Packrat board of directors meeting at the QTH of John, KB3XG. Call (610) 584-2489 for directions. All interested parties invited. Meeting starts at 8:00 P.M.
- 15 Predicted peak of the Geminids meteor shower at 1052 UTC.
- 13-14 ARRL 10 Meter Contest. 1800 UTC Saturday until 0200 UTC Sunday. See page 108 of the Dec. issue of QST for the rules.
- 15 Check into the 220 MHz Net on 222.125 MHz or 224.58/R at 8:30 PM EST.
- 15 Check into the 432 MHz Net on 432.110 MHz at 9:00 PM EST.
- 18 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!
- 22 Predicted peak of the Ursids meteor shower at 1145 UTC.
- 22 Check into the 6 Meter Net on 50.150 MHz at 7:30 PM EST.
- 22 Check into the 903 MHz Net on 903.100 MHz at 10:00 PM EST.
- 23 Hanukah begins at sundown.
- 25 Merry Christmas to all.
- 29 Check into the 2 Meter Net on 144.150 MHz at 8:00 PM EST.
- 29 Check into the 1296 MHz Net on 1296.100 MHz at 10:00 PM EST.

Jan. 1998

- 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 this issue of Cheesebits or consult your contest package for the rules. See the Dec. 1997 issue of QST, page 104 for the rules. Page 100 and 103 has general rules for all contests and contests above 50 MHz.

Pack Rat Beacon Report

Ron J. Whitsel, W3RJW

We are finally getting close to putting the 3.4, 5.7 and 10 GHz beacons on the air. All three antennas are finished: 16 Slot waveguide antenna on 3.4 GHz and 32 Slot waveguide antennas on 5.7 and 10 GHz.

The beacon transmitters are nearing completion. The 10 GHz beacon is finished and running just about one watt at the output. It is going to be on a frequency around 10,368.180 MHz. The slot antenna will be fed with about 30 feet of elliptical waveguide. The antenna is 480 feet above street level in center city philly (Same location as the 432 thru 2304 beacons).

The 3.4 and 5.7 beacons are nearing completion. They will each run 3 to 5 watts. The frequencies will be in the 180 to 200 KHz above 3.456 and 5.760 GHz range. The antennas will be fed with 30 feet of LDF-4. There will be slight delay until new crystals for the bricks come in.

The antennas are going up this week. As soon as the beacons are finished and tested it will be a simple matter to just connect up to the waiting antennas. Thanks to many people who donated parts and their time to complete this project

Working behind the scenes have been: W3RJW (beacon design & construction), N3DQZ (Antenna bracket, antenna and feedline installation), N3AOG (antenna construction), WB3KRW (ID keyer), WB3JYO (3.4 GHz amp), AA2UK (10 GHz Amp and feedlines), W3KM (5.7 GHz Amp), WA3NUF (pin switches), WA2ONK (waveguide parts), AA3GN (antenna parts), W2SK (5.7 brick), W2UR (3.4 GHz brick), W3JIT (10 GHz brick), and WC2K (waveguide connectors)

Stay Tuned for the Grande Opening.

ARLB070 FCC ISSUES RF SAFETY SUPPLEMENT B TO OET BULLETIN 65

Hams now have basic guidelines and tools to evaluate their stations for compliance with the FCC's RF exposure guidelines that go into effect January 1, 1998. The FCC's Office of Engineering and Technology issued the long-anticipated Amateur Radio Supplement B on November 18. The FCC worked closely with the Amateur Radio community to develop the new supplement. Several ARRL Headquarters staff members and Technical Advisors reviewed preliminary drafts of the supplement. ARRL Lab Supervisor Ed Hare, W1RFL, has been the League's point man for RF safety and exposure issues.

Supplement B, subtitled Additional Information for Amateur Radio Stations, contains detailed information specific to ham radio stations. It is designed to be used in conjunction with the FCC's OET Bulletin 65 (Version 97-01), Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. The revised Bulletin 65 was issued earlier this year. Supplement B covers definitions of RF radiation and discusses the FCC exposure guidelines and their applications, methods of predicting human exposure, estimating compliance distances, and controlling exposure to RF fields.

The supplement runs approximately 70 pages. Among its noteworthy highlights are numerous easy-to-use tables based on various frequencies, power levels and antenna configurations to help hams determine whether their stations comply with the FCC's published RF exposure guidelines. Most tables show compliance distance--the distance that an antenna needs to be located from areas of exposure to be in compliance. (For a closer look, see "FCC RF-Exposure Regulations--the Station Evaluation," by Ed Hare, W1RFL, which will appear in the January issue of QST.)

The new RF exposure rules go into effect January 1, 1998 for all new stations and for those filing a Form 610 with the FCC after that date. Existing stations have until September 1, 2000 to comply with the new rules. But, existing stations making changes that could affect RF exposure from their station--such as increasing power or relocating antennas--must evaluate that change if done after January 1, 1998.

As first announced, the FCC set a power threshold of 50 W to trigger the need to do a station evaluation. In late August, the FCC revised the power level thresholds to trigger a routine Amateur Radio station RF exposure evaluation. Those changes were welcome news for most hams. The newest guidelines raised its original 50-W threshold on all bands except 10 meters through 2 meters, where it remains at 50 W.

The FCC went along in part with an ARRL request and established a sliding scale for threshold levels dependent upon frequency. The revised thresholds are 500 W for 160 through 40 meters, 425 W on 30 meters (the maximum legal power is 200 W), 125 W on 17 meters, 100 W on 15 meters, 75 W on 12 meters and 50 W on 10 meters. The threshold for all VHF bands is 50 W. On UHF, the threshold level is 70 W on 70 cm, 150 W on 33 cm, 200 W on 23 cm, and 250 W on 13 cm and higher frequencies.

The threshold for amateur repeaters is 500 W effective radiated power (ERP) if the repeater antenna is located on a building or is less than 10 meters above ground.

Stations operating at or below these respective power levels are categorically excluded from having to conduct a routine RF radiation evaluation. Mobile and portable (hand-held) devices using push-to-talk operation generally are also exempt from evaluation. But, all stations--regardless of power level--still must comply with the RF exposure limits that become effective New Year's Day.

OET Bulletin 65 and the new Supplement B are available at <http://www.fcc.gov/oet/info/documents/bulletins/#65>. Copies are available from International Transcription Service Inc., 1231 20th St. NW, Washington, DC 20036; Tel 202-857-3800; fax 202-857-3805. (Editor's Note: If you don't have access to the web, call me in advance of the December meeting and I will provide you a copy of Supplement B. NO MAILINGS - you have to be there to get a copy. My fast review of the bulletin is that it will take a little studying and work to figure out the field exposure levels if you are above the minimum power levels).

"FREE" EMAIL SOFTWARE!!!

By: Dennis, N3DG

As an attendee of the November meeting, I see how much the club has depended upon e-mail to intercommunicate and share information. Ron mentioned that about 30 Rats are currently on email as compared to 5 this time last year. I will be happy to provide anyone with a copy of Juno which is a 100% FREE EMAIL service for single or multiple accounts. Anyone with a modem and Windows 3.1 or 95 is ready-to-go. I will do this at no charge and provide a free diskette, provided that the demand is not humongous (if so, I may ask merely for a floppy in return, but I don't think that will be necessary). I think I should be able to manage the demand. Please either contact myself (Dennis, N3DG) or Al, K3EOD and I'll turn it around.

24 GHz TRANSVERTER

by Paul Drexler, W3JYO and John Sortor, KB3XG

In Search of a 24 GHz Transistor...

As John mentioned in an earlier article, there aren't that many low cost FET's that will work at 24 GHz. A quick look at most of our favorite GaAs FET's reveals that they're only rated to 12 or 18 GHz. This "maximum frequency" spec usually refers to the frequency where the available gain from a perfectly matched device drops to approximately 5 or 6 dB, hardly a *hot* device at that frequency! At these frequencies people typically design amplifiers using unpackaged die components since, by eliminating the package parasitics, more performance can be had. Although higher gain is available with unpackaged devices, assembling ham equipment using "chip and wire" techniques would be a costly and tedious project. And if there was to be *any* hope of Joe Ham reproducing this design, we had to find a packaged device that would work at 24 GHz. Besides, we wanted to show that using the right techniques, it *could* be done with packaged parts!

Fortunately for us, some of the high frequency, low noise PHEMT's we're now using for LNA's turn out to have some gain at 24 GHz. The NEC NE324 PHEMT was our first candidate since I had used this device professionally for a low cost LNA at a similar frequency. The catalog s-parameters stop at 18 GHz. Usually this indicates the maximum frequency of operation the manufacturer recommends and to use the device above 18 GHz wouldn't prove worthwhile. I was able, however, to obtain additional s-parameter data from the manufacturer which showed reasonable gain thru 24 GHz. S-parameter data for the '324 at 24 GHz is listed below.

S11	0.416	-5.7°
S21	2.356	-160.8°
S12	0.159	-127.3°
S22	0.436	82.5°

A quick analysis of this device with a commercial CAD program showed that 7-8 dB gain *should* be possible. Not bad for a \$5 transistor! Expected noise figure is around 3 dB. One drawback of the PHEMT's is that they have a fairly low compression point, around +5 dBm or so. With more power in mind several other devices were considered for a "high power" output stage – something on the order of +20 dBm, or so. Again, with packaged parts the choices are limited and very expensive (e.g. around \$50 a piece for small quantities). John and I thought we better keep things simple for the first cut of this design, so we scrapped the idea of an on-board "high power" stage for a later time.

mmWave Circuit Board Material

At 10 GHz and lower frequencies we're accustomed to using 0.031" thick woven-teflon PCB material. At 24 GHz there are several problems with this board material. The first problem is that the teflon dielectric becomes lossy and, in the extreme cases, can actually resonate in this frequency range, causing drastic impedance and loss changes! The solution is to use a thinner teflon dielectric to move the resonance higher in frequency. Also, the woven teflon used for the 0.031 type boards has larger fibers, causing thickness variations which can lead to problems – thinner board materials more appropriate for this type of work also use a finer weave mesh. Thirdly, since we need to use plated thru-holes for our design, the actual thickness, or length, of a plated thru hole in a 0.031 board starts to look fairly inductive at 24 GHz. The obvious solution was to go with a 0.010 teflon board. While this is quite a bit more expensive than the standard 0.031 materials, its performance is worth it. Since the board is very thin it must be handled with care; we intended to solder it directly to a brass plate carrier for support.

Capacitors at 24 GHz

John and I thought we might be able to get away with using a low value (i.e. 0.2 or 0.5 pF) ATC "A" capacitor at 24 GHz for series blocking and RF bypassing. You want a low reactance at the frequency of operation, but you want to make sure that the capacitor isn't operating above series resonance, otherwise it looks inductive. ATC's catalog shows that a 0.2 pF ATC 100 "A" capacitor goes series resonant around 20 GHz – lower than our frequency of operation. At some future point we might want to measure some actual capacitors at 24 GHz to see if we can get away with them, but we thought we'd better stick to a more tried and proven capacitor for our first design iteration.

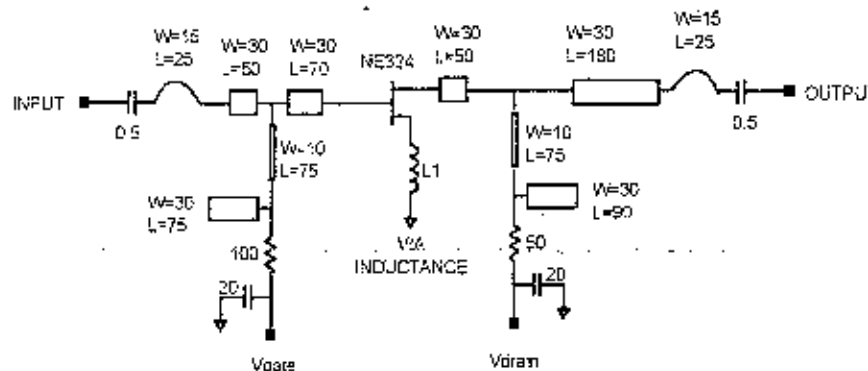


Single Layer "Die" Capacitor with Ribbon Attached

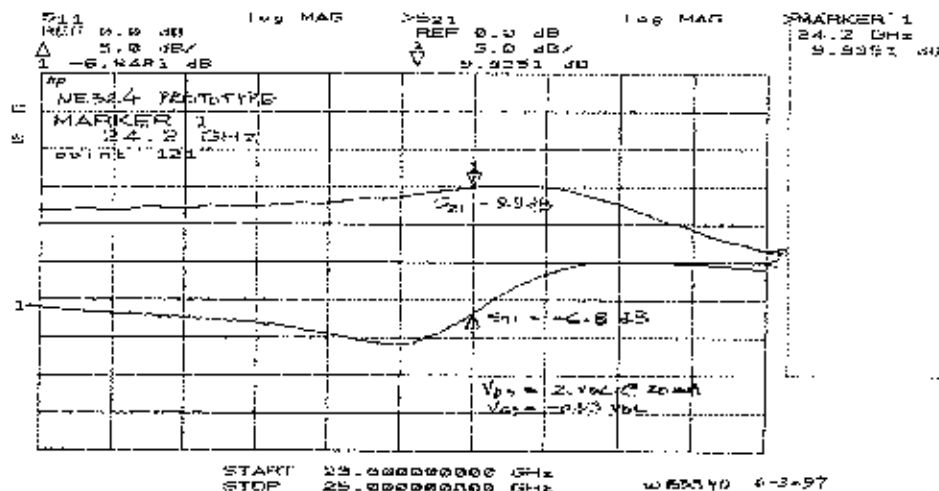
A single layer "die" capacitor is a much better performer at these frequencies due to its lower parasitic inductance. The single layer capacitor looks like a sandwich made of two tiny plates separated by a dielectric material. A 0.5 pF capacitor of this type, has a resonance frequency above 35 GHz! The disadvantage of using a single layer capacitor is simply that they're so small, typically measuring roughly 0.020 x 0.020 inches. All assembly must be done under a microscope. Also, an additional connection has to be made to the top plate using a low inductance wirebond or ribbon. Even the small amount of inductance associated with a short ribbon can destroy the effective resonant frequency performance, so all of this had to be modeled on the computer and be included in the circuit design.

Amplifier Design

A 24 GHz amplifier was designed using the NE324 device in common source biased at 20 mA. For simplicity and economy we decided we'd use this same amplifier for both receive and transmit stages. Input and output matching networks were designed to use 50 ohm lines as much as possible in order to minimize impedance discontinuities and keep the layout as simple as possible. On the 10 mil board a 50 ohm lines is approximately 30 mils at 24 GHz. Since the single layer capacitors measure 20 mils square, they sit nicely on the microstrip lines, again this is important to minimize discontinuities. Great pains were taken to minimize the amount of inductance in the source lead of the FET; minimal source inductance is *critical* to obtaining reasonable gain at this frequency. Plated thru holes (via holes) were placed such that they'd be *directly* under each source lead and were included as part of the electrical model for the circuit. Gate and Drain biasing was accomplished using high impedance lines which are slightly less than $\lambda/4$. Low impedance "flags" provide a 24 GHz short circuit at the "DC" end of each line. A schematic of the gain stage is shown below. All microstrip widths and lengths are in mils (thousandths of an inch) and capacitor values are in pF.



Our computer model contained more circuit elements in addition to what's seen above in an attempt to describe the microstrip parasitic effects. The computer indicates a predicted gain of 8.5 dB at 24 GHz. When our prototype was constructed and turned on, we only saw 1 or 2 dB gain on the network analyzer! So much for computer models... After just a little tweaking however, it was clear that we needed to add a few microwave stubs to provide a better match at 24 GHz. This was done under a microscope by adding small pieces of 20 mil wide copper ribbon. Once we added a few tweaks, the measured gain was almost 10 dB, *better* than predicted! Maybe our computer model wasn't too far off after all! Considering the construction techniques used and the uncertainty in the transistor s-parameters, we felt this was a pretty good accomplishment using a \$5 transistor.



SWAP SHOP:

(send all ads to the editor)

FOR SALE: Kenwood TS830S, 10-160 meter 100 watt digital transceiver, excellent condition with manual and service manual, box, \$550, Jim-W3FIE, 215-342-9343.

FOR SALE: Epson LQ 24 pin dot matrix tractor-fed printer with manual, very good condition, \$25, Phil-WF3W, 215-938-7917.

WANTED: Yaesu FT736R VHF/UHF Transceiver, Yaesu 8 pin desk mike, Yaesu SP767 speaker, Kenwood TL922, Drake L4B, Henry or Alpha HF Amplifier, Ameco AC1 HF transmitter, 6 meter power amplifier (solid-state or tube), 440 power amplifier, Digital Voice Keyer, CW Keyboard. Dennis, N3DG, 215-938-8820.

FOR SALE: Kenwood TS830S HF transceiver w/CW filter and manual \$500.00, MFJ-784 Tunable Audio DSP Filter. \$125.00, 45 el. 2304 MHz Loop Yagi \$50.00, 45 el, 903 MHz Loop Yagi \$50.00 each (2 available). Contact: Paul Drexler, WB3JYO, 609-538-1687 (eve), 908-935-7150 x234 (day), "pdrexler@hotmail.com"

TID BITS

The Dec. issue of QST has the official results of the **June VHF QSO Party**. The Rats took 4th place in the Multi Op category with 721K. Packrat K2TXB and friends in WNY took 7th place with 319K. Rat W3OR took 6th place overall in the Single Op category. Other Rats operating the contest were Gene, KB3IB, Joe, WU3T, and Rick, KB3PD. In the same issue, the **August UHF Contest** results show Packrat AA2LJK in 5th place overall in the Single Op category with 106K points. Other rats operating in the contest were Len, N3NGE, Bob, W2SJ, Joe, KU3T, and Dave, W3KM.

WEDDING BELLS. Wedding bells rang out loud and clear for our own Bob Cook, N2SB, who was married on Saturday, November the first. Not only is Bob's bride a ham, but his father-in-law is also a very active ham. To Bob's and every one's surprise, the priest who performed the ceremony turned out to be a ham. Looks like hams can be found everywhere! Bob and his bride honeymoon in Hawaii, looking for DX. Best of wishes to the newlyweds.

New e-mail address for Richard, K2EVW: rsubin@juno.com.

ARRL Atlantic Division Elections: Incumbent Director Kay Craigie, WT3P, of Paoli, Pennsylvania, easily beat back a challenge from Jim Carson, WK2K, of Ithaca New York. The vote tally was 4918 to 1573. Atlantic Division Vice Director Bernie Fuller, N3EPN, was without opposition for his seat.

WA2FGK/K2LNS op will be at sea on the ship NADIA for the June VHF QSO Party in the FM-39 grid square! Plans include 50-1296 MHz. They are looking for any portable systems for the higher bands (2304 & up) for this expedition. They are also looking for 432, 903 & 1296 antennas. Contact: Herb Krumich, K2LNS @ 717-472-2230 or at 311 Meadow Run Road, Wilkes-Barre, PA 18702.

NEW MEMBERS as of the November meeting: Joe Keer, KU3T, FN20HG, 468 Cheswyck Dr., Harleysville, PA 19438 E-mail at keer@voicenet.com. Bob Applegate, K2UT, FM29NV, 102 Peachfield Ct., Marton, NJ 08053. E-Mail at bob@waterw.com. Bob's web page is at: www.waterw/~bob/

6 METER NET-FN30. In an effort to promote consistent activity from FN30 we are trying to keep our fledgling Thursday evening Net alive. The net, at 50.145 MHz, will start November 20 and run every Thursday evening at 1930 EST. I will act as net control until the thing gets more organized. Net control, K2LDK is running 180 watts into a 3 element Cushcraft.

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:

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

December 1997 Send to: SUBSCRIPTION/ADVERTISING MANAGER:

Bob Fischer, W2SJ
7258 Walnut Avenue
Pennsauken, NJ 08110

DOWNLOADS FOR RATS

By Dave, W3KM

Available on my Web page: <http://www.qsl.net/w3km> are updated files and screen savers for Pack Rats. in addition to other shareware.

1. **CKLIST.dat** Updated file of Rats/Bands enclosed in the Contest Package (electronic updates. wow)
2. **SIXDIGIT.dat** My 200+ call sign file of six digit grid squares. After saving this file to your VHF LOG for Win directory, enter SQUARES and click <Save> in the 6-digit section. This will write a new file of distances and headings from your 6-digit square. Also can be loaded into SQUARES (DOS).
3. **MUIZENVAL (meeses) screen saver.** I got permission from the author to make it available. Download the self extracting .exe to C:\WINDOWS and run it to extract. Then select one of the 2 screen savers in the MAIN/CONTROL PANEL/DESKTOP or DISPLAY section of the Windows Program Manager. I modified it to clear the screen first on one of the 2 provided.
4. **Pack Rat screen saver.** A Pack Rat logo banner flies across the screen along with a text field that you can edit. As with all screen savers, save this file to C:\Windows and select it thru the Program Manager as in #3.

THE SEARCH FOR STAINLESS STEEL HARDWARE

By Phil. WA3NUF

As many of you know I have stripped down my tower and am now in the process of refitting and upgrading the antenna farm. One of my goals from the start was to replace as much of the rusted (formerly zinc plated) hardware as possible with stainless steel. The search for ordinary items such as U-bolts at a reasonable price and delivery time has been a real education.

The hamfest dealers I talked to all gave me the same sad story, that they used to stock S.S. hardware but nobody ever bought it.

The local building supply stores have little bins with huge price tags per item and nothing exotic like a U-bolt.

The Thomas Register listed dozens of distributors, many local, but almost none of them carry hardware. They will gladly order it for you if have the time and money.

The price differences between suppliers that do stock stainless hardware is as much as 60%!

The winner in my case turned out to be located within a mile from my house. MSC Industrial Supply Co. (215-956-9650) has warehouses in several states including one in our backyard. The catalog is over 3 inches thick and the prices were the lowest that I found. They accept small orders and plastic money and they also guarantee same day shipment. For those that like to browse before buying, MSC has a small showroom filled with interesting tools and things you won't find at the local Home Depot (unless you're one of those rare people who can actually find things at Home Depot). You can pick up a catalog at the showroom or order one from their WEB page: www.msccdirect.com/

I am passing on this information in case there are others who are contemplating tower work and need a real hardware store.

K2EVW SURVIVES ANOTHER VOYAGE

By Richard, K2EVW, rsubin@juno.com

Hello Rats. You have no idea how glad I am to be home! Well, I always say that but it's true. If it wasn't for the money I'd never leave. Anyhow, maybe this job is winding down and I'll have to look for something else in another year or so but today is now.

Gak! I missed the conference and HAMARAMA this year. Ham projects all over the shack. Guy anchors for tower height increase still not in (boy, will Ron ronk me about that!). It's really tuff getting things done when you have no continuity in your life. Seems as tho I have to start over every time I come home.

Well, I was going to CC: John Sortor with this message but I changed hard drives while I was away and his e-mail address is on my back-up ZIP drive which I haven't had a chance to set up yet.

The big news here is...Someone ran into my house with a truck! Made a hole in the wall. Broke the inside wall too. You might ask, how can this happen on a one lane dirt road in the mountains? Well, there's a bridge some distance away from here that the state decided was unsafe and needed to be rebuilt. The detour has changed the lonely lane in front of my house into a major highway. TRAFFIC! DUST! May the new bridge finish ASAP.

I'll be passing by going to visit mom in Margate. I have 220 in the car so I'll hit the RATS repeater as I roll past. Maybe I'll catch someone on. I have local 220 repeaters here and I'm on but the 220 population down here is so sparse you wouldn't believe it.

The Pack Rats Announce 4th Annual January Contest Award!

(For Non-Members Only! Pack Rats Not Eligible)

Once again as an incentive to increase activity on the VHF + bands during the ARRL January VHF Sweepstakes on January 17-19, 1998, The PACK RATS will sponsor a special award to be given to the NON-CLUB MEMBER, SINGLE OPERATOR STATION that works the most PACK RAT QSO's on all bands.

For example, if W3ABC works W3RJW on 5 bands and works WA3NUF on 2 bands he will have a total of 7 PACK RAT QSO's.

Please submit a copy of your logs with PACK RAT QSO's worked indicated for verification to Bob Fischer, W2SJ at the address below.

Deadline for logs received will be 30 days after the contest. The award will be a handsome brass key mounted on a finished wood base with an engraved plate and a pen holder. This award was on display at our "HAMARAMA" hamfest in October. If you saw it you will want to display it in your shack soon!

All participants submitting logs will receive a certificate suitable for framing.

NOTE: SEE LIST OF PACK RATS AND BANDS THEY WORK ON BACK.

For Any Questions, Please Contact:

Bob Fischer, W2SJ

7258 Walnut Avenue, Pennsauken, NJ 08109

609-665-8488



List of Pack Rates to look for in the 1998 January VHF SS

CALL	GRID	BANDS USED	CALL	GRID	BANDS USED
KU3A	FN20kj	6-2-222-432	K3MFJ	FN20le	6-2-222-432-903-1.3-2.3
WN3A	FN20hb	2-222	KA3MGB	FN20cm	6-2-222
N3AOG	FN20ke	6-2-222-432-903-1.3-2.3-3.4-5.7-10.3	WA3NFV	FN20kc	6-2
WA3AQA	FN20kc	6-2-222-432-903-1.3	N3MGE	FN20bd	6-2-222-432-903-1.3-2.3
W2AXU	FN20of	6-2-222-432	N3MIA	FN01st	6-2-222-432
K3BPP	FN20ig	1.3	W3NID	FN20fh	6-2
WU3C	FN20kg	2-222	W3NSI	FN20wa	2-222
N2DEQ	FM29ls	2-222	WA3NUF	FN20ke	6-2-222-432-903-1.3-2.3-3.4-5.7-10.3
K3DMA	FN20kc	6-2-222-432	WA2OMY	FN20hd	6-2-222-432-903-1.3-2.3-3.4-5.7-10.3
N3DQZ	FN20kh	6-2-222-432-903-1.3	WB2ONA	FN20tl	6-2-222-432-903-1.3-2.3-3.4
WA3DRC	FN20lf	6-2 432-903	W3OR	FM28fn	6-2-222-432-903-1.3-2.3-3.4
K1DY	FN54jq	6-2-222-432-903-1.3-2.3	N3OZO	FN20ke	6-2-222-432
K3EBZ	FN20ke	1.3	WR3P	FN20kb	6-2-222
WA3EHD	FN20kd	6-2-222-432	KB3PD	FM29dq	2-222-432 1.3
N3EMY	FN20kd	2-222-432	K3PHY	FN20kd	6-2-222 903
K3EOD	FN20lb	6-2-222-432-903-1.3	W3PST	FN20jh	6-2
K3ESJ	FN20ii	6-2-222-432-903-1.3	NK8Q	FN20kl	6-2-222-432 1.3
K2EJV	EM96uw	2	W3RJW	FN20le	6-2-222-432-903-1.3-2.3-3.4-5.7-10.3
N3EXA	FN20ij	6-2-222-432-903-1.3-2.3	WA3RLT	FM29cx	6-2-222-432 1.3
K2FK	FN20mj	6-2-222-432-903-1.3-2.3	W0RSJ	FN20jq	6-2-222-432-903-1.3-2.3-3.4
W3GAD	FN20mf	6-2-222-432	WB2RVX	FM29mt	6-2-222-432
WA2GFP	FN20kd	6-2-222-432	WB2RXM	FM29mu	2-222
AA3GN	FN20jg	6-2-222-432-903-1.3	W3RZU	FN20jd	2
K3GNC	FN20ja	6-2-222-432-903-1.3-2.3	N2SB	FN20wa	6-2-222-432-903-1.3-2.3-3.4-5.7
N3GSA	FN20hk	6-2-222-432-903	W2SJJ	FM29lw	6-2-222-432-903-1.3-2.3-3.4
W3GXB	FN20jm	6-2-222-432-903-1.3	W2SK	FN20ke	6-2-222-432-903-1.3-2.3-3.4-5.7-10.3
W3HFY	FM29ix	6-2-222-432-903-1.3	W3SYN	FN20kc	6-2-222
W3HK	FN20la	6-2-222-432	KU3T	FN20hd	2 432
W3HMU	FN20kl	6-2-222-432	K2TXB	FM29pt	2 432 1.3
WA3IAC	FN20lb	6-2-222-432-903-1.3	WA3U	FM29jq	6-2-222-432-903-1.3
KB3IB	FN20nd	6-2-222-432-903-1.3	AA2UK	FM29qo	6-2-222-432-903-1.3-2.3-3.4-5.7-10.3
W3IIT	FN20hd	6-2-222-432-903-1.3	W2UR	FM29ov	6-2-222-432-903-1.3-2.3-3.4-5.7-10.3
N3ITT	FN20kl	6-2-222-432-903-1.3	K2UT	FM29nv	2 432 1.3
K3IUU	FN20ld	6-2-222-432	K3VEQ	FN20hf	6-2
WB3JYO	FN20og	6-2-222-432-903-1.3-2.3-3.4	WB2VLA	FN20of	6-2-222-432-903
WC2K	FM29pt	6-2-222-432-903-1.3-2.3-3.4-5.7	KB3XG	FN20hd	6-2-222-432-903-1.3-2.3-3.4-5.7-10.3
W3KKN	FN20kd	6-2-222-432-903-1.3-2.3	WA1YHO	FN42it	6-2-222-432-903-1.3-2.3
W3KM	FN20jk	6-2-222-432-903-1.3-2.3-3.4	WA3YUE	FN20hd	6-2-222-432
WB3KRW	FN20ji	6-2-222-432-903-1.3	WB8ZAR	FN10wp	6-2-222-432-903-1.3-2.3
K3LOW	FN20jd	6-2-222-432			

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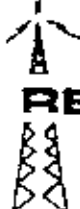
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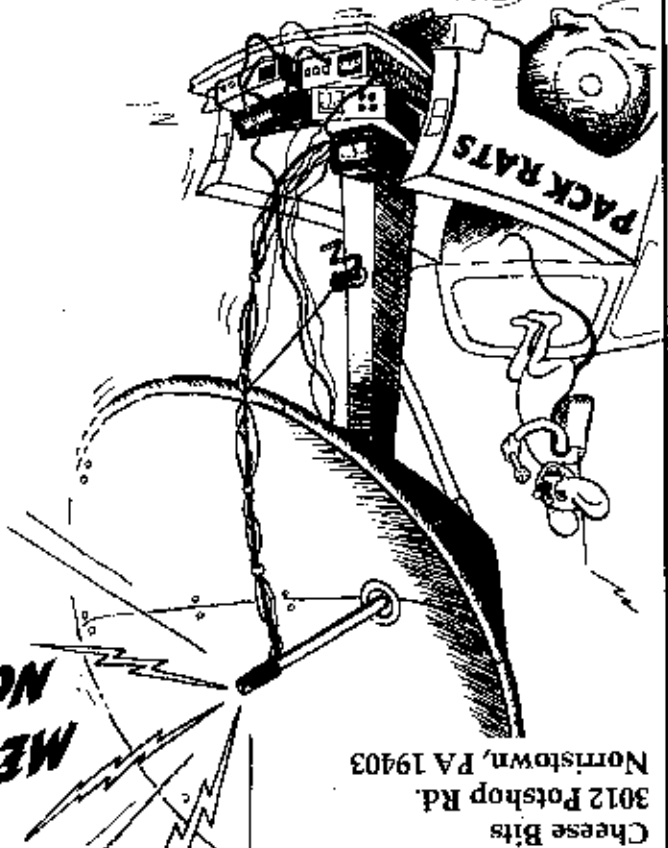
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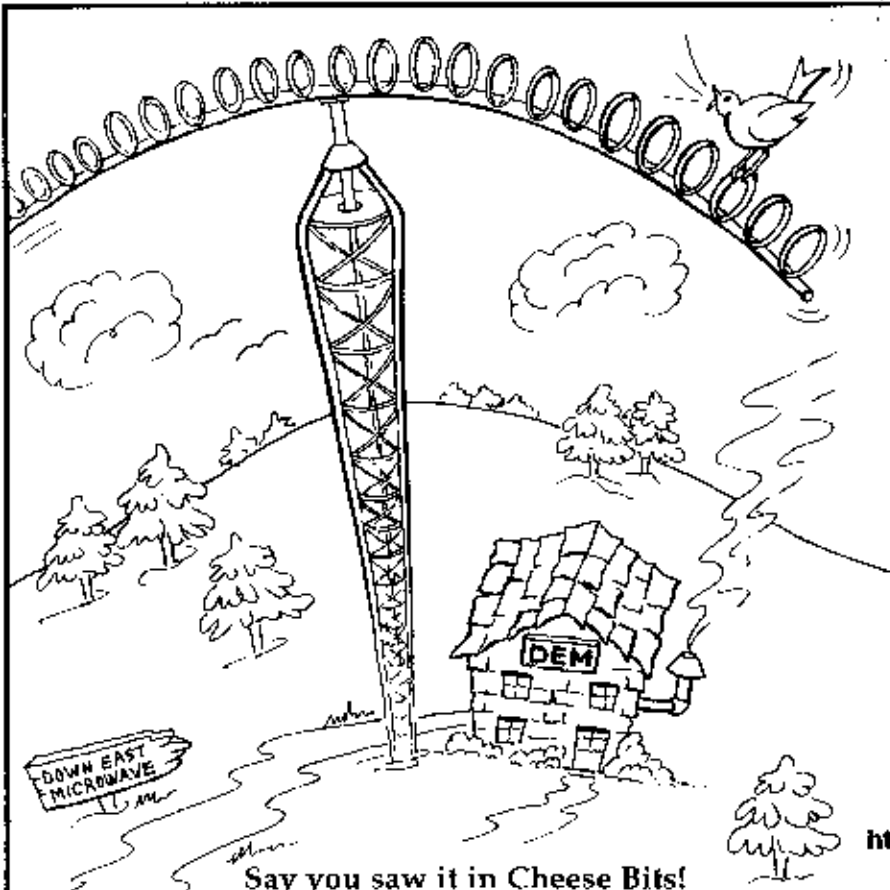
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