

CHEESE BITS



W3CCX

CLUB MEMORIAL CALL



ARRL
Affiliated
Club

VOLUME XLII

March 2000

Number 3

The PREZ SEZ

I thought Griff, NE3I, was going to make a run for the "millennium crying towel". But, I think he made too many improvements over the last year. There must have been some new guilt over winning the coveted award two years in a row. His station is performing better, and it was time to step aside! Did I say "too many"? There are always ways to make improvements, and I know Griff was busy upgrading feed lines this year! There was a moment when I thought he might make a run for the finish, but I think that this year he didn't feel abandoned, and I bet he felt the "packrat feeding frenzy" when his signal was heard on the microwave bands!

To continue on the theme of the crying-towel meeting, I did not hear many tales of whoa! Perhaps the best disaster story was kept out of contention by one of the volunteer judges, Joe KU3T. It seems that there was some "interference" with guy wires as he ran his hazer up the tower, shortly before the contest. This ripped the IF bulkhead connector right off the tower mounted transverter. That sounded like a candidate story for the towel! I wonder if volunteering to judge the competition was a strategy to avoid consideration for the big award? Another member in the running, who was not at the meeting, with perhaps the greatest tale of whoa, was Don N3OZO. As far as I know, he may still be out of commission after taking a fall on the ice. Of course Jerome, K3GNC told his tales with a remarkable delivery style. He is always in the running for this award. There is a message here though ... someone should help with his antenna installation to make sure the stuff stays up there for a while.

Our towel recipient, Joe K1JT, with a "brand new shiny Pack Rat membership" took top honors. Joe managed to be in the wrong place at the right time to claim this award. He was voted into the club earlier in the meeting, and now it was time for the stories. His tale went like this: The library shut down due to snow and forced cancellation of our January meeting. This would have been the meeting needed for membership vote for induction, just before the contest. Well, Joe didn't hear about the cancellation, and headed over to Southampton to find an empty parking lot. (Where are these Pack Rats?) Then came the bad news that we could not use his log towards the club score. This really had the eyes of our collected membership weeping. It was hard to out-class this sequence of events. And so it was for the year 2000 towel. It can only be up hill from here, and hopefully, (as Joe put it); we don't get edged out by another club for lack of his 70,000 points. That would be a real kicker!

As we start into March, the new projects for the year are starting here. From past experience, I now know what I will be working on the week before next years January contest! I jumped in and ordered the new DEM 10gig kit. It is a plumbing project with mimics and surface mount components. This is a real test for the eyes. But if it is successful, perhaps we can get some other members enthused to try their hands (and eyes) and get on this band. Stay tuned ...

73, Ed, WA3DRC

MEETINGS

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

Pack Rats **CHEESE BITS** is a monthly publication of the
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Southampton, PA

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PACKRAT 222 MHz REPEATER - W3CCX/R

222.98/224.58 MHz, Churchville, PA FN20LE

OFFICERS: 1998-1999

| | | |
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| PRESIDENT: | WA3DRC | Ed Finn, ed_finn@ustc.vlsi.com |
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| | N3EXA | (1 Yr) Brian Taylor |
| | N3ITT | (2 Yrs) Al Sheppard, alitt@epix.net |
| | N3XEM | (2 Yrs) Bob Minch, raminch@bellatlantic.net |

PACK RAT BEACONS - W3CCX/B

FM29JW Philadelphia, PA
50.080 144.284 222.065 432.295 903.072 MHz
1296.251 2304.037 3456.220 5760.190 10,368.170 MHz

MONDAY NIGHT NETS

| <u>TIME</u> | <u>FREQUENCY</u> | <u>NET CONTROL</u> |
|-------------|------------------|--------------------|
| 7:30 PM | 50.150 Mhz | WA3EHD/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 | W3RJW/WA3DRC |
| 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: | NK8Q | 610-847-2285 |
| VHF CONFERENCE: | KB3XG | 610-584-2489 |



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Calendar of Coming Events - March 2000

- 4-5 **ARRL International DX Contest** (phone). See page 99 of the Dec. 1999 issue of QST for rules.
- 9 **Packrat Board of Directors** meeting at the QTH of Ed Finn, WA3DRC, in Richboro, PA. All interested parties welcome. Starts at 8:00 P.M. Call 215-322-2105 for directions.
- 12 **York Springfest 2000**, York County Area Vocational Technical School, Exit 6 of I-83. For info contact Keystone VHF Club, , POB 7462, York, PA. 17404. Talk-In on 146.97-.Contact Dick, WA3USG at, 717-697-2490.
- 16 March meeting of the Mt. Airy VHF Radio Club at 8:00 P.M. at the Southampton Free Library on Street Rd. The program will be the annual **HOME BREW Night**. Bring your successes, failures and works in process to share with all. You do not have to be a member to enter. All interested VHFers and microwave enthusiast are welcome. Prizes will be awarded in several categories.
- 17 **St. Patrick's Day**
- 18 **Cherryville Repeater Assn Hamfest** at Harmony Twp., NJ. North Hunterdon High School, Rt. 31 S, Clinton, NJ (½-mile south of I-78 on Rt.31). Talk- In: 147.375+ (no PL, extended coverage) or 146.730-. \$6 (XYL, kids under 14 free), Vendors \$15 ea., electric \$5 extra VE Testing: Contact Marty Grozinski, W2CG at 908-788-2644 before 10:00 PM.
- 20 Death of Brendan, Dublin 1964.
- 23 **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.
- 25-26 Timonium Md. **ARRL Maryland State Convention and Greater Baltimore Hamboree** and Computerfest at the Maryland State Fairgrounds. VE exams given. Call 1-800-HAM-FEST. TI on 146.67- and 224.24-.
- Sept.
- 28-30 **Microwave Update 2000** hosted by the Mt. Airy VHF Radio Club will be held at the Holiday Inn Select, Bucks County, 4700 Street Road, Trevoese, PA 19053, (215) 364-2000, (800) HOLIDAY. For more information contact John Sortor, KB3XG at JohnKB3XG@aol.com, or <http://www.ij.net/packrats/mud.html>.

JUNE VHF QSO PARTY

de AI, N3ITT, June Contest Chairman

Springtime!! Finally, the dew is on the daffodils, warm weather has been creeping in, and the June contest is fast approaching. What's that, you think just because the Jan. Contest is all wrapped up we can kick back for awhile?? Well, fuggitaboutit!! Let's keep the momentum going and shift right to June contest mode.

As any of you who have been with the Packrats to Camelback for the June contest know, this is a major undertaking, that is why I am starting to ask NOW for everyone who is physically able, to mark June 9 thru 12 on their calendar now for this years contest, the club needs YOUR help to make this effort a success. It is a lot of work. But it is also a lot of fun!!

Right now I am still trying to get commitments for band captains so PLEASE if you would like to take a band let me know if you were a band captain last year and want to do it again, let me know. I also still need one truck driver! Don and Doc and myself have agreed to provide cooking services again so you know there will be plenty of good food!!! I'm also looking for ideas. How can we improve our score? Would it help to have our logging computers linked so all the info is shared? Can anyone work with Dave (W3KM) to achieve this? Should we get more rovers out? KIDS/N1XKT, have suggested a few guys build laser units, I hope some can do so. Try to think of ways we can reduce "missed" QSO's. We'll that's it for now. I am going to try to plan a meeting sometime in April, so look for the date soon. Till then, enjoy the wx!! 73 AI

TID BITS

Chris Getman, N3PLM, has appointed to be a director of the club by President Ed, WA3DRC, to fill out the 1999-2000 term of Bob, N3XEM.

AI, N3ITT, has been appointed Contest Chairman the club multiop effort for the **June 2000 VHF QSO Party** on Mt. Camelback, FN21 in the Poconos.

Joe, KU3T, has been appointed as the **Chairman of Hamarama 2000**. Mark your calendar - it's on Sunday, 1 Oct. 2000.

Leon Rosen, N1XKJ, was voted in as a member of the club. He operated the January Sweepstakes as a rover with KIDS and beat his score. Leon is a recent graduate of the University of Maryland. Leon's address is 206 Kimberton Drive, Blue Bell, PA 19422-3255. Phone is 610-270-8884.

Joe Taylor, K1JT, was also elected to membership. Joe reported that he got his first vhf antenna up last June since being off since 1961. Joe is active on 50 thru 50/144/223FM/432 and has just started successfully operating HSMS. Joe is ex K2ITP and first started operating in 1954. He operated a 500 watt 4-250 amplifier on 6 meters with a 6 over 6 antenna and had an article in the Dec. 1958 issue of QST on ionospheric meteor scatter. k1jt@arrl.net.

24 GHZ AMP PROJECT UPDATE

Paul Drexler W2PED/ Tom Whitted WA8WZG

Hi Folks. Thought it was about time to give another update on our project... we've had another few delays with things, but overall I think we're doing pretty well. Here's where we're at.

Received the high frequency PC boards. These are the expensive 5 mil duroid type boards. Got a nice little price break from Filtran microcircuits in Canada. We'll probably end up spending it though, on other components for the project as all of our costs were based on estimates. Other good news here is that they were able to get more than 35 boards on a panel, so we'll have a few spares for more amps in the future.

Received 50 pcs of the LNA MMIC die. These are used for the first 2 stages in the power amp, and for the LNA.

Sam Ruffin at C3I is making good progress on our bias board PC layout and expects to have boards for us by the end of the month. Thanks Sam!

Amplifier housings: The machinist we had on tap to do our housings is working 6 days a week and totally swamped with work at his REAL job. We'd like to thank Dick, N3AOG, for his assistance and valuable inputs to the housing design. Fortunately, Stan KA1ZE, has stepped in and volunteered to help us out with the required machining. There are some pretty exacting dimensions, etc with this housing. Stan has translated our Auto Cad file and is gearing up his CNC machine to make aluminum chips. We really appreciate Stan for getting involved to order to help the group.

Bias Board Assembly and Test: Tony, WA8RJF, and Tom, WA8WZG, have volunteered to help with the assembly and test of the SMT bias board. These guys might be able to use a little help though, if there's any volunteers out that way.

Misc: At this point I'm ordering the rest of the components for the RF section and the bias board. We expect to be building some of the RF sections by the end of the month. If things go well, I'm hoping we can get our first couple of amps built and shipped early next month. Maybe we'll have a few distance records broken during the upcoming spring/summer roving season!

73, Paul Drexler W2PED/ Tom Whitted, WA8WZG

TID BITS Contd.

VUCC Award Checking If you want QSL cards checked for your initial VUCC Award or an update, contact Harry, W3IIT at hbrown@voicenet.com or call 610-584-4846.

The **EME Annals** listing in the World Above column of the March issue QST shows Packrats Roger, W3SZ, with 61 initials on 144 MHz EME and Harry, W3HZO, with 54 on 1296 EME. Where's KU3T? The **September VHF QSO Party** results were in the March issue of QST showing Packrats W2SJ, K1JT, W3OR, N3NGE, AA3GN, N3XEM, W3RJW, W3SZ, W3KM, KB3IB, AA3RE, WA3DRC, N3PLM, NE3I, and W3IIT entering logs. The **10 GHz and Up Cumulative Contest** results show W3RJW, KU3T and KB3XG taking the first 3 places in the third call area. The **1999 IARU HF World Championship** results show W2UR leading SNJ with AA2UK, W3PED, and WB2EYF also operating (I didn't know it was a VHF Contest!).

V31PC Beacon Heard. The Packrat provided Six Meter beacon at V31PC, was reported by Herb, W3BO, to have been heard! It's working! It was reported at RST 579 by N5WS in EL09 on, Saturday, at ~1748 UTC, Feb.5.

AA3GN reports an **Interesting web page.** Harry, SM0VPO, describes building cavity resonators from various household items ranging from trash cans to soup cans etc and copper tubing. He has used them as NBFM receivers (a coffee can VHF "crystal set") to bandpass cavities for ten meters built in a loaded garbage can. <http://sm0vpo.8m.com/use/cavity.htm>. Also other fun stuff there - enjoy. And you must read his stupid questions page (FASQ).

RF design info webpage. If you are looking for a website loaded with design info and free design software to help you with your latest project try www.rfglobalnet.com/. This site has a version of the popular APPCAD software that is made for windows along with other shareware downloads for antenna design, smithcharts, etc. Check it out. 73, Phil, WA3NUF

The Feb 432 & Above EME Newsletter is at: <http://www.nitehawk.com/rasmit/eme0002.html>.

MARCH 2000 N.E.W.S. letter on Web!. I just finished the NEWSletter and you can read it on-line with Adobe Acrobat Reader which can be in your browser. Just click: <http://www.qsl.net/k1uhf/NEWS/news0003.pdf>. 73, Del, K1UHF.

SWAP SHOP

(send all ads to the editor)

FOR SALE: CALLSIGN HISTORY. Name and address of each holder since 1912. Cost \$15 plus SASE for printed CERTIFICATE. Wanted CallBooks before 1970 and QST's before 1940 will buy or trade. Also looking for 1x2 Ham Radio License Plates for my collection. Ron Allen W3OR, PO Box 73, Bethel, De. 19931-0073 or call 302-875-1100.

W3HFY's Estate Sale. Many items listed in the January issue of Cheesebits from Hal, W3HFY's shack are still available and are being offered for sale by Hal's daughter-in-law, Lynn Grace. The price on each item is negotiable. Lynn's phone number is 610-259-0231 (**NOTE CORRECTED PHONE NUMBER**).

FOR SALE: FT 902DM Transceiver, \$650, TS830 Transceiver, \$500, (both have transverter ports), Heath SB 200 Amplifier, \$300, TenTec KW Antenna Tuner, \$159. Contact WA2FGK/K2LNS at 570-472-2230.

JANUARY 2000 VHF SWEEPSTAKES RESULTS

Total Logs: 56

Total Club Score: 2,747,911

Single Op/Rovers

| Call | OSOs | Grids | Score | 50 MHz | 144 MHz | 222 MHz | 432 MHz | 903 | 1296 | 2304 | 3456 | 5.7Gup |
|---------|------|-------|---------|--------|---------|---------|---------|-------|-------|------|------|--------|
| W3RJW | 851 | 154 | 317,702 | 163 34 | 246 29 | 101 20 | 130 22 | 52 13 | 72 14 | 35 8 | 21 5 | 31 9 |
| WA3NUF | 778 | 130 | 226,590 | 128 22 | 263 28 | 106 23 | 116 23 | 43 10 | 60 12 | 23 3 | 17 4 | 22 5 |
| N3EXA | 655 | 102 | 129,438 | 139 23 | 218 21 | 85 18 | 101 17 | 40 10 | 49 7 | 23 6 | | |
| WA3DRC | 587 | 92 | 121,716 | 62 7 | 177 23 | 77 13 | 133 19 | 48 11 | 62 13 | 15 2 | 13 4 | |
| N3NGE | 533 | 97 | 120,183 | 132 18 | 111 16 | 75 14 | 83 15 | 37 11 | 57 12 | 24 6 | 10 4 | 4 1 |
| W2PED | 558 | 97 | 116,788 | 124 25 | 156 21 | 79 13 | 85 14 | 33 7 | 46 8 | 24 5 | 11 4 | |
| W3KM | 445 | 80 | 71,840 | 66 16 | 164 20 | 68 12 | 66 11 | 26 6 | 36 8 | 16 5 | 3 2 | |
| KU3T | 452 | 72 | 66,672 | 53 10 | 145 23 | 69 10 | 117 18 | | 47 7 | 21 4 | | |
| AA3GN | 437 | 63 | 61,110 | 33 2 | 177 25 | 60 6 | 96 17 | 30 4 | | 20 4 | 12 3 | 9 2 |
| K3GNC | 468 | 72 | 60,192 | 67 8 | 169 24 | 73 13 | 91 15 | 31 6 | 37 6 | | | |
| K2TXB | 537 | 69 | 53,958 | | 464 49 | 1 1 | | | 65 16 | | | 7 3 |
| N3ITT | 431 | 68 | 50,184 | 70 13 | 164 20 | 61 10 | 81 13 | 25 6 | 30 6 | | | |
| AA3RE | 432 | 71 | 47,144 | 109 24 | 155 20 | 69 13 | 67 9 | 17 3 | 15 2 | | | |
| AA2UK/R | 252 | 51 | 42,891 | 29 6 | 52 10 | | 72 12 | | 44 8 | 22 5 | 14 3 | 19 7 |
| WA3GFZ | 438 | 52 | 42,276 | 98 14 | 137 14 | 72 9 | 77 9 | | 38 4 | 16 2 | | |
| W2SJ | 313 | 40 | 35,160 | 43 6 | 64 7 | 53 6 | 51 6 | 28 3 | 35 4 | 23 4 | 11 3 | 5 1 |
| K3MFI | 360 | 42 | 26,418 | 85 12 | 124 10 | 65 7 | 39 5 | 16 2 | 25 4 | 6 2 | | |
| WA3EHD | 346 | 36 | 23,220 | 85 10 | 106 10 | 60 6 | 53 5 | | 27 3 | 15 2 | | |
| K3IUV | 338 | 45 | 22,365 | 81 18 | 108 8 | 72 8 | 72 9 | | 5 2 | | | |
| N3AOG | 205 | 33 | 17,655 | 40 9 | 39 2 | 35 5 | 33 6 | 17 2 | 19 2 | 9 2 | 5 2 | 8 3 |
| W3DFM | 208 | 44 | 16,280 | 61 15 | 59 8 | 37 6 | 22 7 | 11 3 | 14 4 | 4 1 | | |
| KB3IB | 193 | 45 | 15,570 | 51 12 | 51 12 | 26 7 | 34 8 | 14 3 | 17 3 | | | |
| WA3AQA | 315 | 29 | 15,428 | 60 6 | 116 10 | 53 6 | 47 3 | 15 2 | 24 2 | | | |
| WA3RLT | 238 | 34 | 12,206 | 59 7 | 106 13 | | 49 10 | | 24 4 | | | |
| NE3I | 251 | 29 | 12,093 | 46 4 | 89 10 | 38 2 | 53 9 | | 25 4 | | | |
| W3GXB | 206 | 34 | 11,696 | 35 8 | 81 12 | 35 2 | 31 7 | 12 2 | 12 3 | | | |
| N3PLM | 228 | 32 | 11,424 | 61 13 | 78 10 | 34 2 | 39 4 | 9 1 | 5 1 | 2 1 | | |
| K3HZO | 119 | 38 | 8,968 | 4 2 | 38 13 | 30 9 | 27 9 | | 20 5 | | | |
| K1DS/R | 134 | 27 | 8,100 | 22 5 | 32 6 | 28 3 | 23 4 | 10 2 | 12 2 | 4 1 | | 3 4 |
| W3SZ | 115 | 32 | 7,712 | | 61 14 | 2 2 | 30 8 | | 15 4 | 7 4 | | |
| W2SK | 89 | 24 | 6,216 | 15 6 | 14 3 | 15 3 | 12 3 | 5 2 | 17 2 | 5 2 | 4 2 | 2 1 |
| K3DMA | 233 | 17 | 6,035 | 47 4 | 88 6 | 50 3 | 36 2 | | | 12 2 | | |
| W3IIT | 160 | 18 | 4,212 | 35 3 | 53 5 | 36 4 | 35 5 | | 1 1 | | | |
| KB3XG | 47 | 13 | 3,926 | | | 1 1 | | 9 2 | 8 2 | 9 2 | 8 2 | 12 4 |
| K3PHY | 151 | 12 | 2,868 | | 89 9 | 49 2 | | | 13 1 | | | |
| W3GAD | 121 | 14 | 2,604 | 24 4 | 32 4 | 36 3 | 29 3 | | | | | |
| K3JJZ | 127 | 12 | 2,064 | 16 2 | 66 8 | 45 2 | | | | | | |
| WB2VLA | 74 | 16 | 1,696 | 12 4 | 36 7 | 18 2 | 5 2 | 3 1 | | | | |
| N2DEQ | 112 | 11 | 1,309 | | 105 9 | 7 2 | | | | | | |
| KU3A | 60 | 16 | 1,280 | 16 6 | 28 7 | 5 1 | 9 1 | | 2 1 | | | |
| WR3P | 60 | 15 | 1,095 | 25 9 | 22 4 | 13 2 | | | | | | |
| N3GSA | 41 | 15 | 840 | 9 4 | 17 4 | 6 3 | 9 4 | | | | | |
| K3BPP | 28 | 17 | 476 | 28 17 | | | | | | | | |
| W1SD | 49 | 6 | 462 | | 21 2 | 17 2 | 11 2 | | | | | |
| KA3MGB | 19 | 6 | 114 | | 19 6 | | | | | | | |
| K3VEQ | 43 | 2 | 86 | | 43 2 | | | | | | | |
| W3RZU | 19 | 2 | 38 | | 19 2 | | | | | | | |
| N3EMY/R | 7 | 4 | 28 | | 7 4 | | | | | | | |
| N3EVV | 6 | 1 | 12 | | | 6 1 | | | | | | |
| W3HMU | 2 | 1 | 4 | | | 2 1 | | | | | | |

MULTI OP

| Call | OSOs | Grids | Score | 50 MHz | 144 MHz | 222 MHz | 432 MHz | 903 | 1296 | 2304 | 3456 | 5.7G up |
|---------------------------------|------|-------|---------|--------|---------|---------|---------|------|-------|------|------|---------|
| W2UR | 1048 | 177 | 351,876 | 264 46 | 398 41 | 94 23 | 131 28 | 44 9 | 59 12 | 29 7 | 15 5 | 14 6 |
| w/N3EMY K3GYS | | | | | | | | | | | | |
| W0RSJ | 1154 | 188 | 323,172 | 356 61 | 469 46 | 114 29 | 135 26 | 28 9 | 33 9 | 13 5 | 6 3 | |
| w/WB2ONA W3DFM N2EOC N2IX + NET | | | | | | | | | | | | |

| | | | | | | | | | | | |
|-------------------|----|---------|--------|--------|-------|--------|------|------|------|-----|------|
| WA2OMY 591 | 91 | 104,104 | 134 20 | 204 23 | 70 13 | 93 16 | 23 5 | 37 5 | 12 3 | 7 2 | 11 4 |
| w/WA3YUE | | | | | | | | | | | |
| N3DQZ 590 | 95 | 95,095 | 123 26 | 198 20 | 87 15 | 111 16 | 32 9 | 39 9 | | | |
| w/W1SD | | | | | | | | | | | |
| K3EOD 417 | 69 | 34,3621 | 61 26 | 179 25 | 42 9 | 33 7 | | 2 2 | | | |
| w/WR3P K3IPM WF3W | | | | | | | | | | | |
| K2FK 344 | 51 | 30,702 | 74 11 | 100 13 | 67 10 | 71 12 | 26 3 | | | 6 2 | |
| w/W3GAD | | | | | | | | | | | |

CRYING TOWEL AWARD

Sad stories about the January 2000 VHF Sweepstakes abounded at the February meeting. January Contest chairman Joe, AA3GN appointed Gary Halbe, N3EMY, Chris Getman, N3PLM, and John Taylor, K3DMA, as judges, who awarded this year's crying towel to Joe Taylor, K1JT, and selected Jerome Byrd, K3GNC, to receive the runnerup award.

Joe, K1JT described his great effort with many pitfalls of trying to pull together a station for the January Contest after many years of absence from the bands and standing in the snow at the doors of the darkened and locked library on 20 January and his disappointment at being unable to join the club and compete for club credit.

K3GNC described his frustrations at putting up his antennas at his mother's house near Cheltenham Avenue only to have them blown down again multiple times and proudly carried off his prize, consisting of eight feet of toilet paper.

Other contributors to this sad session were Ben, WA3RLT, with high windstorms seriously affecting his antennas and having to use the foot switch to key his transmitter for his contact with K2TXB.

Jim, WA3EHD, reported that his equipment worked fine but he had operator problems.

Al, N3ITT, reported his first single operator effort is several years with everything working fine with only a microphone problem with his 520 used on 2 meters. Al reported that he had to catch himself from calling CQ during the net on Monday night.

Rick, K1DS, and Leon, N1XKJ, were really ready to rove. They had an oil leak on the Rover Wagon, had problems with the gas tank (according to the gauge) staying full of gasoline all of the time, eliminated his plans for FN30 due to high winds, had limited rotator movement, forgot the maps and found that son Leon beat him due to his early departure for business.

Brian, N3EXA, had to put up a new rotator, found that the 432 amp from last January was still bad, had some diodes loose their smoke, overslept Sunday morning and had his best score yet

Griff, NE3I, attempted to go two years in a row to win the towel. He got a call from a client 10 minutes into the contest, had a friends birthday party to go too and his wife's uncle died the day after the contest. His station updates doubled his score from last year. Walt, WA3AQA reported everything worked fine but his score went way down.

EI, K3JJZ, was on for the first time since 1986 with the help of borrowed equipment and much assistance from Gary, WA2OMY. He brought his winning towel (finely crafted by the XYL of W3IIT) from his 1983 efforts.

Phil, WA3NUF reported quiet conditions partially due to low activity of usual nearby rats. Major problems were with his long favorite Vibroplex keyer developing high contest resistance (yes, CW is a legal mode for VHF contests).

John, KB3XG, did a major rewiring job and replaces his 903 and 1296 transverters as well as putting up a new 70 ft Rohn 45 tilt-over tower just before the contest resulting in little operating time. He estimated that the time lost from work and new equipment costs resulted in a cost of \$650 per QSO.

Joe, KU3T, reported that all equipment worked that was not destroyed while he was trying to install it. He had minor problems when he cranked up the hazer and pulled the N connectors off of several coax cables.

Paul, W2PED, reported everything worked fine wit his score being about 10% better than last year. He observed that the real contest is before the contest.

Joe, AA3GN, scrambles the last two months to get his station installed with temporary antennas at his new QTH with all working.

More SWAP SHOP

FOR SALE: Yaesu FT 726R VHF/UHF Tribander with 144-148 and 430-440 modules, hand mic, and manual. In excellent condition, \$450.00. Black leather executive desk chair, swivel, high-back, with wheels. Great for ham shack, excellent condition, \$200.00. Two (2) W6OAL (Olde Antenna Lab) 2 meter Big Wheel "Cloverleaf" antennas with N-connector feed, power divider and phasing harness. Antennas are in very good condition and cost \$400 new. Selling all for \$150. Pick-up only. Contact Harry Schools, K3HS at 215-483-1111.

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THEY NEVER TOLD ME NOT TO - PART 2

By: Laura Halliday VE7LDH

(No tune on 1296, 2304 and 2400 continued from the Feb 2000 issue of Cheesebits)

A really good idea

Now that this is done, we amateurs can benefit from the work done by the no-tune transverter designers. Since the critical part is done once the PC board is etched, all that we need to do is add the remaining parts to the board, test it, and use it. Since the filters are already matched to 50 ohms, we can use *any* 50 ohm components between them. Since the boards are dimensionally stable, we can cut them up, use the components to make other things (or test stages in isolation), and fit the pieces back together. It all sounds like a dream come true. Books for beginners recommend the no-tune transverters as an easy way to get on microwaves [Case94], [Campbell92]. Best of all: it's true. These things work.

I tried it

My no-tune transverter experience extends to KK7B's 1296 MHz transverter, and to WA8NLC's 2304 and 2400 MHz versions [ATUR]. The 2400 MHz version is the LO and receive side of the 2304 MHz converter. Not knowing what I was doing, I bought one complete kit, and a second set of boards. In this way I could build a transverter from a proven design that would have a very high probability of working. I could then use it to test the results of my own experiments on the victims...ahem, other boards.

The only component that has ever given me any difficulty is the KK7B local oscillator board [ATUR], which starts with a crystal oscillator in the 90 MHz range (you use an FM radio to tell if it's oscillating) and multiplies it by 6 to around 540 MHz. I've built three of them on various frequencies, and while the crystal readily oscillates on the correct frequency, I seem to get odd frequencies (and low output) out of them until I tweak the diode multipliers.

It is, however, pretty obvious when they work. I have found an older UHF television receiver (the continuous tuning variety) to be a handy broadband relative power indicator. The 576 MHz output of the 1296 MHz transverter LO board, for example, comes in on channel A31, and you can easily see changes in signal strength.

My assembly technique is good enough that I have never fried any components. Nor have I ever lifted any traces off the boards—a concern on the Teflon 13 cm boards. Not at all bad for somebody who had never worked with this technology before.

Updates

The no-tune transverters date back to the 1980s and in the meantime people have gained a great deal of experience with their strengths and weaknesses. Experience has taught people how to make better transverters. Some updates are based on new technology, like MMICs that were not available at the time of the original design [Kostro96]. Others are based on engineering and operational experience, like regulated MMIC power supplies [Ward93], and shielding things that radiate RF [Campbell94]. Some have pushed no-tune technology to X band [Orban96]. An important new technology is prepackaged computer clock oscillators, some of which are available in useful frequencies. These oscillators are simpler to use, cheaper than an equivalent circuit made out of discrete components, and work every time [Campbell95]. They're even more compact. Campbell's article is also a useful overview of design decisions in the no-tune transverters, with indications of future directions.

My no-tune transverters all have cut traces and additional components, little daughterboards and shielded filters. Some have LO's based on computer clock oscillators. Do they work any better? They appear to; I don't have test equipment for anything more than qualitative comparisons. Bragging rights are, of course, another matter entirely.

Simple stuff

Commercial interest in microwave communication is producing a steady flow of interesting new components. These components are aimed at mass-produced consumer products, so they are cheap, robust, and easy to apply. These components include low-noise amplifiers, power amplifiers, mixers, phase locked loops, and more. Examples include the ERA series of MMICs from Mini-Circuits, MMIC amplifiers internally matched to 50 ohms, with useful gain to X band. Mini-Circuits makes a wide variety of other components, including mixers. National Semiconductor makes PLL chips useful to 2.5 GHz. Hewlett-Packard make GaAs MMICs useful to X band. *Everybody* makes various chips for S band applications.

The simplest S band downconverter I've been able to come up with uses an HP MGA-86576 GaAs MMIC [Ward94] and a Mini Circuits SKY-5G mixer on a little PC board. I simplified the circuit by considering just what image response the converter needs, knowing that I will use it with a directional antenna. Since the antenna is pointing at the sky most of the time, the odds of anything other than noise being on the image frequency and in the antenna's pattern are remote. Since we are dispensing with image filtering, the choice of IF is open. Noting that we are receiving a 2400 MHz signal (24×100), if we choose a LO frequency of 2376 MHz (24×99), we have a LO frequency that can be generated from a standard 66 MHz computer clock oscillator module ($24 \times 99 = 36 \times 66$). For compatibility with available PC boards my LO uses a 74AC04 tripler to 198 MHz, an additional tripler to 594 MHz, and a final quadrupler to 2476 MHz. The circuitry will be familiar to users of the KK7B and G4DDK microwave LOs [ATUR], also [Campbell95].

The 24 MHz IF affords no image rejection with any reasonable filter, and so carries the price of a 3dB degradation in the signal-to-noise ratio. How will this work with Phase 3D?

You can approach this in one of two ways. Obtain the information on Phase 3D's orbit and S band transmitter and do formal link budget calculations. Or compare the known performance of OSCAR 13 S band equipment (for example, [Miller92]) and extrapolate to a very simple converter receiving Phase 3D signals. Either way, don't take my word for it. Please try it yourself. Even better: try both ways, and compare the results. Best of all: build it and get on Phase 3D. Another simple to use device is Motorola's MRFIC2401, a complete low-noise amplifier and down-converter in a single SO-16 package. It requires very few external components to make a

2400 to 144 MHz converter (the recommended IF range is from 100 to 350 MHz) of respectable performance. Having been designed for portable telecommunications equipment, its current requirements are miniscule. The performance is much the same as the MGA-86576/SKY-5G converter, which is to be expected, because the LNA in the MRFIC2401 has similar specifications to the MGA-86576. The RF portions of both these converters are extremely simple, but their local oscillators are complex. Is there a better way?

Lessons learned

What have I learned? A summary:

It works: Microwave communications provide efficient, reliable, highly predictable communications with modest antenna and power requirements. They will be a delight to use on Phase 3D.

Parts are available: There are many suppliers of generic electronic components, and a handful who sell more interesting RF components. Cherish them! In this age of direct international dialing and credit cards, I define a "local supplier" as one on the same planet as myself. While they are geared toward OEMs, I have often found local industrial distributors to be receptive to friendly, polite requests.

New and neat parts: Commercial interest in wireless communications is growing explosively, and we can benefit from this. Since designers want to be able to make money for their employers as quickly as possible, the new components are easy to use, and are often already matched to 50 ohms. All you have to do is string them together, like the building blocks they are. All semiconductor manufacturers have their datasheets online now, making it easy to obtain information. Do it!

The HUH?! factor: I sometimes feel like I have just arrived from Vega when I try to discuss microwave amateur radio with other hams, whose usual response is blank stares. What is the origin of this disconnect? What can we do about it?

The Narrowband Preoccupation: While we can send and receive SSB and CW on the microwave bands, and these are sometimes the best modes, they are not *always* the best modes in all circumstances. The microwave bands are tens—even hundreds—of megahertz wide, room for all kinds of useful and interesting signals. Some are starting to express concern that the steep learning curve of narrow-band equipment is hampering the growth of microwave amateur radio [Dixon97]. I routinely receive email informing me that WBFM is Just Not Done Anymore. I beg to differ.

Use what you have: I made my first X band frequency measurements with a ruler, a piece of unetched PC board and a multimeter. While this is not the most accurate measurement, it is far better than no measurement at all. I made my first L band power measurements by counting the number of paces until the transmitter would no longer break the squelch on a hand-held scanner. Again, not a perfect measurement. But it's a place to start. Don't be embarrassed. I'm not.

Band occupancy: With commercial interests eyeing our bands, we *must* make use of them to have any justifiable claim.

Just do it! What are you waiting for?

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Production note

I created this paper with Donald Knuth's typesetting system T E X, running on a 66 MHz 486 PC under the Linux operating system. The published version used fonts from the ITC Souvenir family; this version uses Times-Roman and Helvetica.

Selective HEMT Preamp for 13 CM

By Michael Kuhne, DB6NT

The LNA described here is suitable for all modes: ATV – Oscar – SSB/CW etc.

The goal was for easy building and aligning.

- The input connector permits direct connections to the coax relay avoiding intermediate adapters.
- The supply voltage can be fed through the coax or externally using a feedthrough capacitor and build-in low pass.
- Low noise figure, typically .7 dB.
- High amplification to compensate for long cable lengths.
- A helical filter is used after the first amplifier stage to avoid overloading of the second stage and the following receiver from out of band signals.
- Electrically stable to avoid tendency for oscillations even with poorly matched antennas.
- Simple construction using a PC board with plated through holes and SMD components.

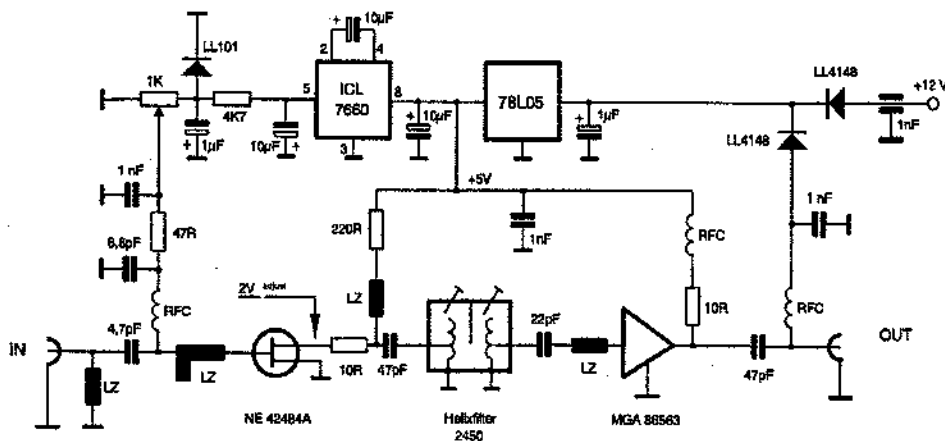
Circuit

The amplifier is built using an HEMT-FET (high electron mobility transistor) in the input followed by a GaAs MMIC. The input stage is matched for wide band low noise and does not use RF elements that require tuning. The circuit was adopted from DJ9BV (Ref 1-2) and modified for easy construction on a single Teflon circuit board. The negative gate voltage for the HEMT is obtained by the ICL-7660; the operating point is adjustable by a potentiometer. Voltage for the transistor is supplied using a LCR network. The source inductance (negative feedback) and the decoupling resistor between drain and helical filter achieve electrical stability. This resistor can be varied from 10 to 39 Ω , it influences the amplification and noise figure, however. The helical filter #2450 by NEOSID can be tuned over the entire ham band and has 50 Ω input and output impedance.

The second stage employs the GaAs MMIC MGA 86563. Its operating

Alignment

After applying operating voltage the drain voltage for the NE 424 should be



voltage can be between 8 and 24 V at app. 30 mA of current. A build-in filter permits feeding through the coax cable. Polarity protection is also provided. Direct (external) supply voltage can also be provided through a feedthrough capacitor.

Construction

- Drill the tin sheet metal housing according to the drawing.
- Mount the coax jacks and feed through capacitors and solder the circuit board all the way around to the box.
- Mount and solder the helical filter
- Solder all SMD components.
- Solder the GaAs components NE42484A and MGA86563. Soldering the "MGA" requires a "steady hand" and a "good eye"; a magnifying glass and a small solder tip with SMD solder is recommended. Also ESD measures should be applied, the soldering iron connected to the building project (grounded).
- Clean the entire board with alcohol to remove any remnants of flux.
- Apply absorbing foam rubber to the lid covering the SMD component side of the box to prevent resonances from the enclosure.

set to 2V with the 1k potentiometer. Next the helical filter is alternately tuned for maximum gain and lowest noise figure. That's it!

The amplifier has been duplicated a number of times and always achieved gains between 35 and 40 dB. The noise figure is around .7 dB. No tendency to oscillate was detected even with the antenna pulled.

Acknowledgements

I would like to thank DL6NCL, DK2DB, DF9LN, and DL3NM for building samples and testing them and also for their many tips and suggestions. Furthermore I like to thank Ulli, DC8SE for providing numerous parts and Mr. R. Schulze Hoeing of the Mauritz Co. for providing PC board material and sample boards.

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- (3) Michael Kuhne, DB6NT "Compact 13 cm Linear Transverter" DUBUS Book 4 pages 264-275
- (4) Data sheet NE42484A, NEC
- (5) Data sheet MGA 86563 HP/AVANTEK

(6) Data sheet R04003 PC boards ROGERS

(7) Data Book: Helixfilter NEOSID

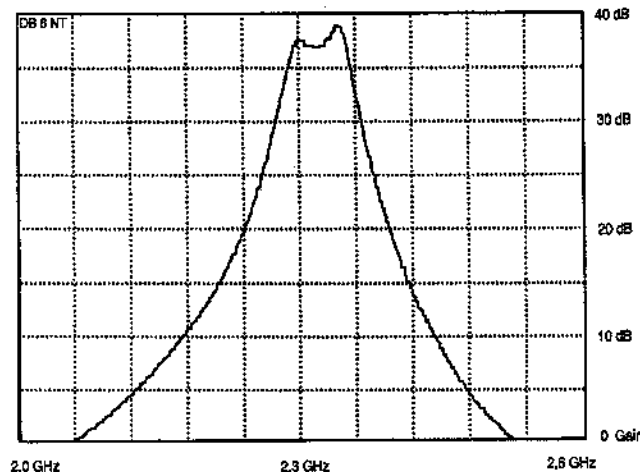
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Editors Note: This article was provided by Gerd, WB8IFM, Editor of the Midwest VHF-UHF Society Newsletter "Anomalous Propagation"

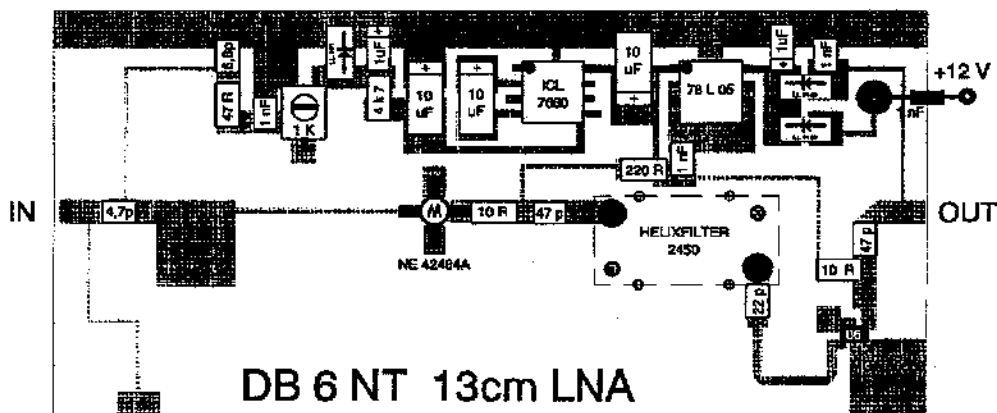
Parts List

| Item | Specification | Source | Item | Specification | Source |
|-------------------------------------|-----------------------|------------|---------------------------|-----------------|----------------------|
| Tin sheet metal housing | 37x74x30mm | | Tantalum electrolytic (2) | 1 μ F / 35V | "A" |
| N-female chassis connector | small flange | | Ceramic capacitor (3) | 1nF / 50V | SMD 0805 NPO Philips |
| N-male chassis connector | small flange | | Ceramic capacitor | 6.8 pF | SMD 0805 NPO Philips |
| PC-board RO4003 8mm | (single or two stage) | Rogers | Ceramic capacitor | 4.7 pF | SMD 0805 NPO Philips |
| Feed-through capacitor, solder type | .1nF | | Ceramic capacitor (2) | 47 pF | SMD 0805 NPO Philips |
| Trimmer pot. 1k | 23B - SMD | Beckmann | Ceramic capacitor * | 22 pF | SMD 0805 NPO Philips |
| Helical filter 2450 | 7.2G | NEOSID | Diode Mini MELF (2) | LL4148 | |
| PHEMT-FET SMD | NE42484A | NEC | Schottky diode | LL101 | |
| *MMIC SMD | MGA86563 | HP/Avantek | Resistor (1206 SMD) | 10 Ω | |
| IC SMD SO8 | ICL7660 | | Resistor (1206 SMD) | 47 Ω | |
| IC SMD SO8 | 78L05 | | Resistor (1206 SMD) | 220 Ω | |
| Tantalum electrolytic (3) | 10 μ F / 16V | "C" | Resistor (1206 SMD) | 4.7 k Ω | |

* Denotes second stage only. It is possible to build a single stage version with 15 dB of gain on a slightly modified PC board



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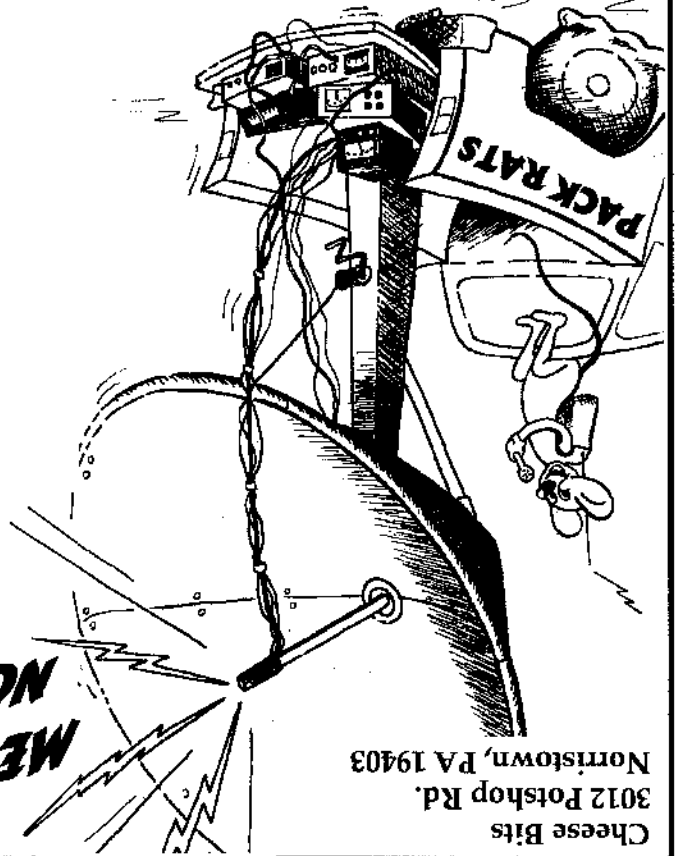
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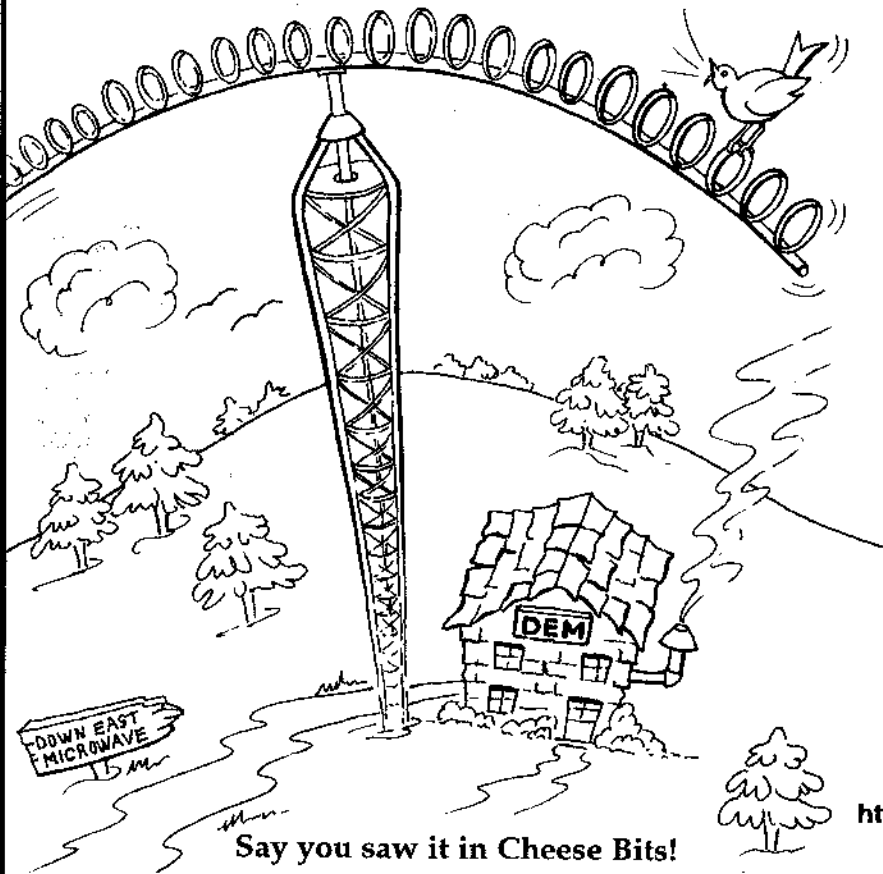
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