



CHEESE BITS



W3CCX
CLUB MEMORIAL CALL



ARRL
Affiliated
Club



Volume XLV

August 2003

Number 8

PREZ SEZ

Summer vacations and running around. Having lots of fun including the White Elephant sale. At a moment of weakness I grabbed Walt N3EUV's high voltage power supply complete with those PCB capacitors. One of the acquisitions was a 430 Mhz power amplifier which provided enough power to key the ATV repeater about 2 miles away from my QTH. All you need is a cable TV converter (Channel 57) and a modulator (Channel 60). Thank you to Gary Hitchner, WA2OMY, for hosting the event.

I am looking forward to the picnic and barbecue at Al and Carol's on August 9th. I always have a great time dodging the lightning bolts and swimming in the pool. Please RSVP to Al or Carol via email or on the phone with your special dish creation so we can get a food and attendees count.

Unfortunately Walt WA3AQA was admitted into the hospital last week and will not be attending the next few meetings. We are looking for an interim recording secretary. We wish Walt a speedy recovery and our prayers are with him.

With many new members, we would like to see everyone wearing their Packrat name badge at meetings. There is a list started for people who need badges. My name is at the top of that list so don't be shy. We will be ordering them soon. There will be several sizes of Packrat jackets available for you to try on at the September meeting. If you are interested, we will also be ordering those.

I hope those who entered the contest last weekend had a good time. I heard the conditions were phenomenal. See you at the picnic. **73s Paul Sokoloff WA3GFZ**



If not for the Monday morning crew, the equipment might be still up on the mountain. Tnx to seated: W2PED, KB3XG, N3EXA, W3EUV, row2 N3OZO, KF6AJ, AA3GN, N3NGE, W3GAD, W3IIT, W3OR back: N3ITT, WA3RLT, WA3NUF & W2SJ.

Credit to W2PED for the pix.

Pack Rats **CHEESE BITS** is a monthly publication of the
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Pack Rat Web Site: <http://www.ij.net/packrats>

SUBSCRIPTION/ADVERTISING MANAGER:

Bob Fischer, W2SJ 7258 Walnut Avenue, Pennsauken, NJ 08110
 (856) 665-8488 bobw2sj@prodigy.net

EDITOR:

Rick Rosen, K1DS 206 Kimberton Drive Blue Bell, PA 19422
 (610)-270-8884 rick1ds@hotmail.com

CLUB TREASURER:

Dave Mascaro, W3KM 1603 Mink Road Ottsville, PA 18942
 (215)-795-2648 dmascaro@motorola.com

TRUSTEE OF CLUB CALL - W3CCX

Ron Whitsel, W3RJW
 (215) 355-5730 W3RJW@aol.com

PACKRAT 222 MHZ REPEATER - W3CCX/R

222.98/224.58 MHz, Churchville, PA

OFFICERS: 2001-02

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CORRESP. SEC: WA3EHD Jim Antonacci, Antonacci@worldnet.att.net

REC. SEC: WA3AQA Walt Zumbach, wzumbach@bellatlantic.net

TREASURER: W3KM Dave Mascaro, dmascaro@motorola.com

QUARTERMASTER: K3IUUV, Bert Soltoff, soltoff@uscom.com

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WA3DRC (1 Yr) Ed Finn

AA3GN (1 Yr) Joe Landis

COMMITTEE CHAIRMEN

January Contest

AA2UK

June Contest: "I'm not the contest chairman"

HAMARAMA: WA3DRC

VHF Conference: KB3XG 610-584-2489

Awards Chairman WA3GFZ 215-884-3116

PACKRAT BEACONS - W3CCX/B

FM29jw Philadelphia, PA

50.080 144.284 222.065 432.295 903.071 1296.251 MHz

2304.037 3456.220 5763.190 10,368.140 MHz (as of 3/1/01)

MONDAY NIGHT NETS

TIME	FREQUENCY	NET CONTROL
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 FN20le
9:30 PM	1296.100 MHz	WA3NUF FN20le
10:00 PM	903.125 MHz	AA3GN FN20ig
10:30 PM	2304.085 MHz	W3KJ, & go to 3.4G & up after FN20hg

Editor's Column

I am extremely grateful to N3FTI for being the pioneer in getting the recently acquired 903 100W amps on the air, and for writing up his conversion experience. Hopefully those that acquired these amps will also improve their 903 output, and be able to obtain the intermediate amp if needed from either KB3XG or W3KM.

The January contest scores have been officially posted, and the club has successfully maintained its top score in the Unlimited Class. The Rochester VHF Group has for the second year in a row topped our score by about 200K points, but with fewer entries in the next club division. Congrats for their efforts and some outstanding rover and multi-op scores. This continues to beckon us to more intense efforts in the future, and will surely be part of the planning for '04.

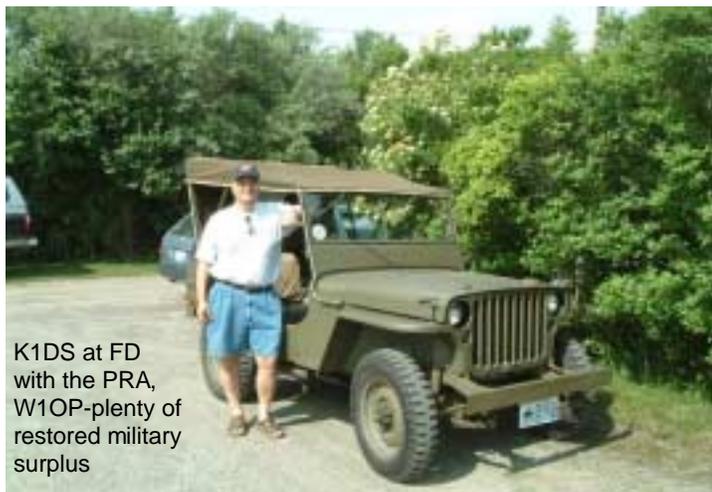
I personally am looking forward to the operating events in August—the UHF weekend and the first weekend of the 10G and up Cumulative. Perhaps a group of Packrats will mobilize their 10G gear and do some mountain-topping, while others look for contacts from home. Check the ARRL website for all official details. It'll be an opportunity to work out on 24GHz also, as several are now operational on this band.

Check out the letter on p8 from Dick Kolbly, K6HIJ. Dick is the SBMS member that I met with on my recent CA trip, and he went to Russia recently, and met up with Sergei, whom K1JT, K2UYH and I all met at the EME conference in Prague last summer. Dick worked for the JPL and did some deep space engineering activity in his prime working years, and remains active in the field, as well as continuing his radio efforts. I also placed the results of the First International Microwave Contest that the SBMS sponsored this past March. We placed second as a club, behind the SBMS, whose winning efforts were based on the 90+ 10GHz QSOs made by their mountain-topping members.

I had to travel to RI for an event on the last weekend in June, and that happened to correspond with FD operations from the PRA again. It was a treat to see the old gang there doing their thing at Beavertail on Jamestown Island, and I even got to pound some brass on 40m CW. Like the swallows returning to Capistrano, the PRA has been returning there as long as I have known them, and probably ever since "Brown" became the keeper of the old property.

I really enjoyed the White Elephant sale meeting. Not only were there interesting things to bid on, but seeing what others collect is also a blast. And the bargains were great. OK—so you missed the pair of HP Power meters—and the 10MHz GPS source that does everything—and the ARC-5 xmtr, 2m FM gear, a prop-pitch rotor, 222 beam, the 2KW power supply and blowers, Superflex, and so on. But this is one meeting you won't want to miss next year. And if you need a 3GHz or 5GHz amp, WA3GFZ still has some to sell. Thanks to Gary, WA2OMY for being such a great host for the event. OK—so what did I come home with? Two mystery boxes full of assorted "stuff" which I bought for the chassis boxes in them, and a working 2m Kenwood HT—always a useful addition to the rover collection. Glad to have several guests and visitors there also to help with the bidding. And a great job by Bert, K3IUUV on the auctioneering, with a fine hand from Bruce, WA2YUE and Don, N3OZO.

Egads! The CQ VHF Contest was INCREDIBLE. The conditions were spectacular on 6m with openings into Eu Sat PM and about to Texas both days. That combined with a bit of Au on 2m Sat PM, and some tropo Sun AM. I only had 3 el on 6 with 150W in the rover, but managed several runs, one TG9, one IW7, and a nice cumulative grid total for about 14 hrs of operating from a total of 5 grids. Not quite what we had about 18 mos ago, but propagation during a contest activity sure has you choosing between running a frequency and hopping around to the rare grid pileups! 73's es C U at the picnic. Rick, K1DS



K1DS at FD with the PRA, W1OP—plenty of restored military surplus

Important Dates and Events

Sat-Sun, Aug 2-3 **ARRL UHFContest** 1800UTC Sat-1800UTC Sun
222 & up, see ARRL website contest page for details

Mondays, Aug 4, 11, 18, 25 **Net Nights** Start @7:30PM, see p2

Sat-Sun, Aug 16-17 **ARRL 10GHz & UP Contest** 0600 loc Sat-2400 loc Sun
see ARRL website contest page for details

Thurs, — BOD MEETING—8:00PM

At the QTH of K1DS—206 Kimberton Drive, Blue Bell, PA

And in lieu of an August Meeting at the Library, come to the:

Sat, Aug 9th — Packrat Picnic — 12:00 noon

At the QTH of N3ITT—77 Foellner Ln—Ottsville, PA

Rain Date Sun Aug 10

Bring the whole family, swim suits & covered dish-Eats @ 2PM

Saturday, Oct 11 **Columbus Day Weekend** Mark your calendars

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Middletown Grange Fair Grounds

Penns Park Road, WRIGHTSTOWN, PA

WRIGHTSTOWN, PA

For More Information via email: packrats_w3ccx@yahoo.com

or: www.ij.net/packrats

903MHz 100W Brick Conversion

This paper describes my modification of the xxxx 100W Linear 960MHz amplifier for use on our 903MHz amateur band. These amplifiers were imported from Australia by Rick Rosen, K1DS and include heatsink cooling fans and a 50 ohm 2dB input attenuator.

Conversion of the amplifier was quite simple

- 1) The amplifier utilizes a DC to DC switching inverter to convert -48V DC input to +24V DC required by the power transistors. Since I planned on powering the amp from an existing +24V DC power supply, the first step was to remove the DC to DC converter and install a jumper from the input feed through cap to the B+ lines of the amplifier. An external fuse holder with 15A fuse was installed to protect the amplifier in case of excessive current draw. The amplifier could now be powered from a +24Vdc power supply.
- 2) The green wire that was connected to the enable terminal of the DC to DC converter is now extended and connected to the second feed through capacitor. This is now an alarm terminal that can be wired to perform numerous functions if the amp goes into alarm.
- 3) The heat sink fans that had been wired in series to run off the -48V supply were rewired in parallel and are now connected to the +24 V supply. Make sure you observe proper polarity so the fans blow onto the heatsink, not pull air away from it.
- 4) If your existing 903 transverter has ~30 watts output you are good to go! Just apply a watt or two of drive and alternately tune the three trimmer caps on for maximum output and maximum input return loss at 903MHz. After they are peaked, drive the amplifier up to 100W output (this should take about 25 watts of drive) and should cause the amplifier to draw around 11 amps from your 24 volt power supply.

Unfortunately most of us don't have 30 watts out of our transverters! Like many, I use a DEMI 903 transverter, rated at 10 watts out. Driving the amp with my barefoot DEMI transverter I managed to get 50 watts output. Not bad, but just knowing it would make another 3dB of power bothered me! What I needed was a linear driver stage to provide between 20 and 30 watts of output to drive the 100W PA.

The STM901-30 hybrid amplifier produced by ST Microelectronics was the perfect solution! This little brick provides 30 watts output with +6dBm of drive at 903MHz. It runs off of 24 volts and best of all, plentiful at the right price! Many of you may remember receiving these hybrids as a door prize at recent VHF Conferences. I used a dremel to "cut" the pcb. Not much to the board, could be done with a exacto knife.

I started out by downloading the STM901-30's data sheet and built up their test circuit on a piece of FR-4 printed circuit board. A hand full of chip capacitor, three coils and four 20K multi-turn pots (50K ohm 10 turn pots were in my parts bin and worked well) are the only components needed to complete the driver amplifier (see table 1 for a complete list of components). The only adjustment required is to set the bias on each stage of the amplifier by monitoring total current and adjusting the bias pots (see table 2 for the proper bias current levels). The amplifier will

make 30 watts with +6dBm of drive at 903 MHz.

With the - 48 to +24 volt dc to dc converter removed (Step# 1) there was plenty of room to mount the hybrid and printed circuit board inside the amplifier's enclosure. A panel mounted SMA connector was installed to feed drive to the new driver amplifier board and a short length of 50 ohm Teflon coaxial cable coupled the output of the driver to the input of the final amplifier.

Since my DEMI transverter makes +40dBm output, and the hybrid only requires +6dBm, ~ 34 dB of attenuation is needed between the transverter and the amplifier. This was accomplished with a combination of the amplifier's existing 2dB attenuator, preceded by a 30 dB coaxial attenuator and the losses in the cable connecting the transverter to the amplifier.

Having more power on the microwave bands is nice, but increasing power from 10 to 100 watts at 903MHz does have its problems! LNAs and T/R relays that can be "Hot Switched" at low power levels can easily be ruined in only a few T/R cycles using this amplifier. Sequencing this amplifier is a must, the cost of a sequencer is a lot cheaper than just one LNA or a good microwave relay!

I hope this article shed some light on the conversion of this amplifier. The STM901-30 driver stage can be used with other 903 amps, and even used as a final stage until you find a surplus cellular amplifier that suits your needs. Please feel free to contact me with any questions you may have... **73 Steve, N3FTI**



903 Beacon

The WA1ZMS beacon on 903.055MHz is back on the air as of 00:30z July 21, 2003. Again, the beacon QTH is FM07fm and the TX power was measured at the typical 100 watts which is the legal limit for automatic beacons here in the US. Feedline is 100ft of 1/2" heliax and the antenna is a folded dipole turn-style. There should be around 50watts of RF at the antenna. QSL reports are welcome.

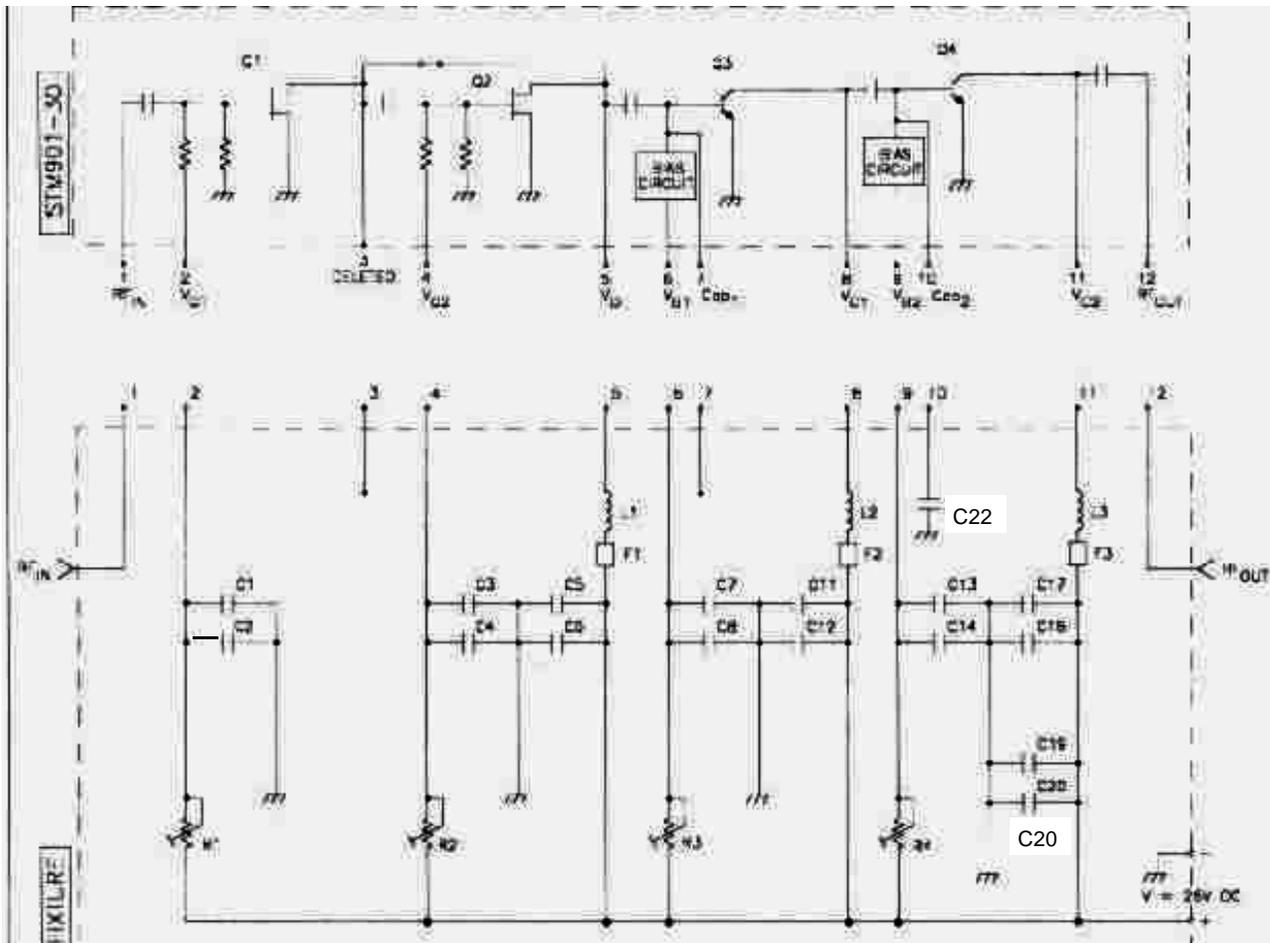


STM903-30 Drive Amp Parts List

#	value		
1)	STM901-30	RF Hybrid	IC1
7)	100pf	Chip Capacitor	C1,3,5,7,11,13,17
7)	.001uf	Chip Capacitor	C2,4,6,8,12,14,18
1)	0.1uf	Chip Capacitor	C19
2)	100uf		C20,22
3)	Ferrite Bead		F1,2,3
4)	5 t of #24 AWG 1.27mm ID		L1,2,3
4)	20K ohm	multi-turn mini Pot.	R1,2,3,4

Bias Adjustment –

- 1) Adjust R1 – R4 for maximum resistance
- 2) Terminate the input and output w/50 ohm loads
- 3) Apply +24V DC
- 4) Monitor total current draw using a digital current meter capable of 500mA full scale.
- 5) Note current draw before any adjustments are made. (Io)
- 6) Adjust R1 for Io + 100mA
- 7) Adjust R2 for Io + 280mA
- 8) Adjust R3 for Io + 330mA
- 9) Adjust R4 for Io + 480mA





More pictures from the June contest. What are you planning for in 2004?

CORRECTION: 3GHz Toshiba Amp

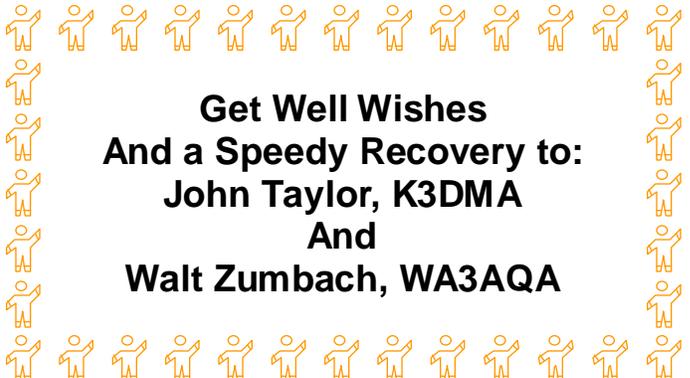
I have updated the article a little since you snagged it. *The only important point is that it should say R217 and R210 were turned fully CLOCKWISE to set the input attenuator to minimum attenuation not anticlockwise...* it wont damage anything but it will take a lot of drive to get 50W o/p. The DEMI heatsink now has a part number HS107 73 Dave WW2R

Eastern VHF/UHF Conference Link

To get to the information at the NEWS VHF Website regarding the 29th Annual Eastern VHF/UHF conference, click this link <http://www.newsvhf.com/vhfconf.html>

24GHz Construction Website

<http://www.qsl.net/km0t/pages/24ghz.htm>
 On his website, KM0T has put together a pictorial and discussion regarding his 24GHz project, which looks quite similar to some of the activities that Packrats are undertaking. There appears to be some good reference issues on his website and this will be of interest to those who are getting on that band.


Get Well Wishes
And a Speedy Recovery to:
John Taylor, K3DMA
And
Walt Zumbach, WA3AQA

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FM28



GPS spots FM18 while waiting out storms



FM18



N1XKT/R



FN30



K1DS/R



FN10



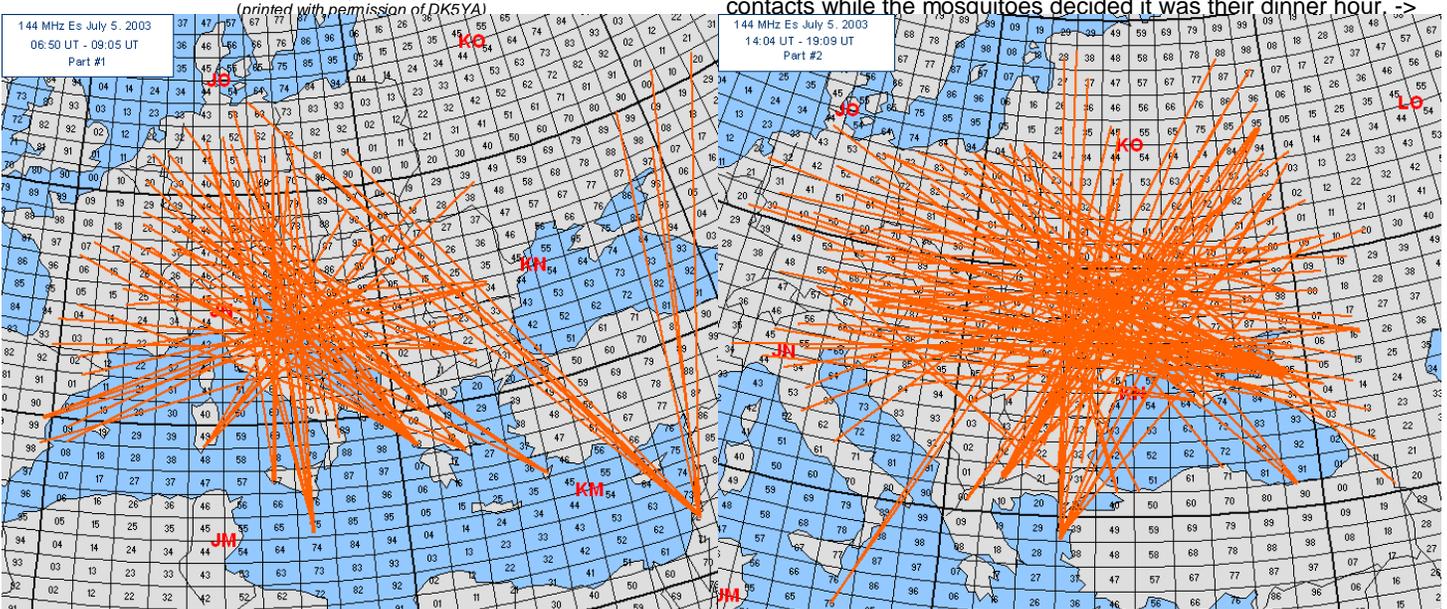
Taking a break on the mountain

Rover Travels

The path started about noontime from home, hoping to get to FM28 by 2PM, but the Rte 95 construction season in Wilmington, DE was in full swing, so I sat in traffic for an hour. Got to a clear spot in FM28 (see above) but many of the big guns were not set up on micros, so settled for the lower 4. Tried 3x with K8GP on 2304—they were blasting in but they didn't hear me despite several tries. Watched as a storm cell moved my way, brought the antennas to their nest and headed toward FM18 to wait it out, finding that the parking lot of Chesapeake College seemed to work fine, despite a somewhat low QTH. Easily worked through 10 bands with AA2UK, W3CCX and 8 bands with K3FTI. Heard his 10G strong, but he didn't copy me. Up to FM19 after a while and parked in a cornfield and repeated many of the same contacts while the mosquitoes decided it was their dinner hour. ->

Summer Es Season in Europe

Thanks to DK5YA, we have the following maps that summarize the intense Es in Europe, with each day's self-reported activity noted at his website at http://www.vhfdx.de/es_summary_03_july_05.htm



Improving 10GHz Frequency Stability With DEM Transceivers

(reprinted from the web with permission from Jerry, K0CQ)

The DEM transverter would respond to a bit of crystal temperature control. Mount a +30°C or 40°C positive temperature coefficient thermistor next to the crystal. Surround the pair with a block of styrofoam. Wire the thermistor across 12 volts. It will heat the crystal above ambient and the foam will keep ambient changes from having as much effect on the crystal temperature. Its not as perfect as phase locking to a 10 MHz high quality reference or to a rubidium standard or a GPS frequency source, but it's far more portable. And it makes those fancier processes easier. 73, Jerry, K0CQ Entire content copyright Dr. Gerald N. Johnson, electrical engineer. Reproduction by permission only. Digi-Key part numbers: 30°C KC001P-ND and 40°C KC002P-ND.

Roving-(continued from previous page)

Return back to FM18 to pick up a few more QSOs that we missed from that grid in the afternoon, and then start the long ride homeward. Although some rovers operate the bands while in motion, for safety and concentration on the road with the van and all those antennas, I keep both hands on the wheel. When I have a roving partner, they can do the driving while I operate or vice-versa. I considered operating for a spell in FM29, but it's been too long a day, so I just get to the home QTH by midnight and plan to get up early Sunday, this time with N1XKT on board. We get up to our usual FN20 spot, but the trees are in full leaf array, so we miss some of the usual 10G QSOs we make from there in the winter. After filling in a bit more of the log we head out to FN30, a nice quiet spot on the inner harbor by the yacht club. The folks in the houses adjacent to the place we deploy remember us from last year, but we add some good will by handing out our roving brochure about ourselves and what we do with the rover and these contesting events. Now on up to FN21, our first 24GHz QSO, and a bit of insight into how the Packrats are making out. Close the loop with a drive to FN11—wow—with all the rain the brush is a lot higher this year—and to FN10, where we find parking on the roadside gives us better vantage than pulling close to the cell tower.

The sun is setting—should we try another 24GHz QSO—no, the trees are definitely in the way, and the 10GHz sigs were not the greatest—and Leon's starting to get tired and hungry-so we head on home, listening to Arlo Guthrie's "Alice's Restaurant"—the long version on his MP3 player—he's surprised that I know all the script! Another great father-son rove in the log. 73, Rick, K1DS/R

Robert A. Griffiths

Attorney at Law

KLETT ROONEY LIEBER & SCHORLING
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12th Floor, Two Logan Square
Philadelphia, Pennsylvania 19103-2736

(215) 567-7857

FAX: (215) 567-2737

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Correspondence

Dear Rick:

My sincere apologies for not sending you this earlier... I realized I should tell you how my visit with RW3BP went. It was quite a memorable experience. Sergei picked me up at the boat, and we visited another ham (RA3ACE) in Moscow, who does a lot of construction. I was very impressed by the ingenuity and quality of their construction. They don't etch circuit boards, they machine them. This ham lived in one of the upper floors of an apartment building, and had set up his shack/shop in what seemed to be the living room.

We were then met one of Sergei's friends, (Vladimir, RW3AAE), and he took Phyllis and I to Bear's Lake, about 30 KM NE of Moscow. Much to my surprise and delight, this was the Russian equivalent of our Goldstone Tracking Station for deep space communications. I worked for JPL at Goldstone for many years, so this was very interesting to me. On their 64-meter dish, they use an elliptical sub-reflector, rather than the hyperboloid that is more common to us. I had a chance to chat with some of the technical staff, and we compared notes on how we accomplished a variety of tasks.

That evening we went to Sergei's house where they had a number of UHF hams and their spouses. We talked about a lot of subjects, made a lot of toasts, and ate too much. I made Sergei a 47 GHz E-H tuner, and we tested it with his equipment. It seemed to work okay.

I took a lot of pictures... Some of them are in the SBMS newsletter. For some reason I missed the last issue of Cheese Bits at the meeting, so I didn't read what you said about our visit. Hopefully, Bill Burns will bring it to the next meeting.

Thanks for your help in setting up the meeting with Sergei. My afternoon and evening with him was the most memorable part of my trip to Russia. 73, Dick K6HIJ



Vladimir
RX3APC,
Sergei
RW3BP,
and son
Alexi in
front of
RW3BP
antenna—
Note
Moscow
skyline

Work-
bench of
RA3ACE



Reflector and feed horn
At Bear Lake 64m dish



Subreflector. Note elliptical (concave) design



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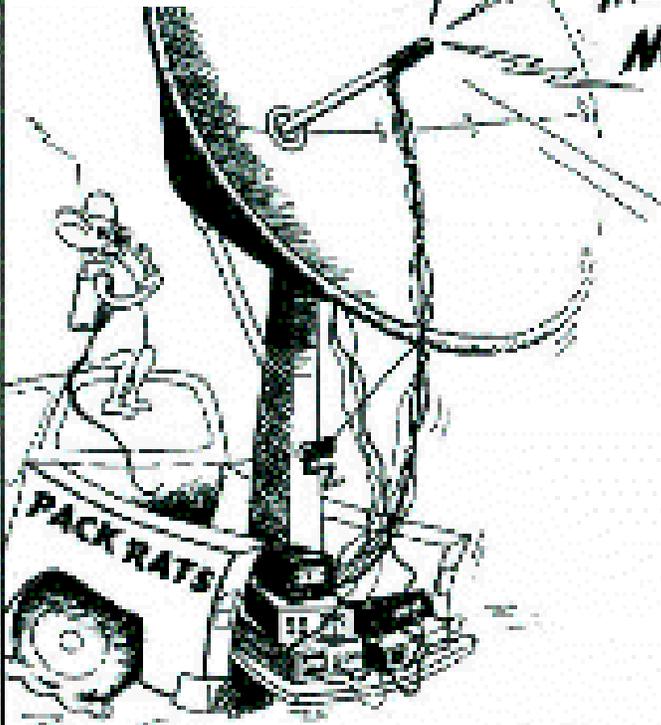
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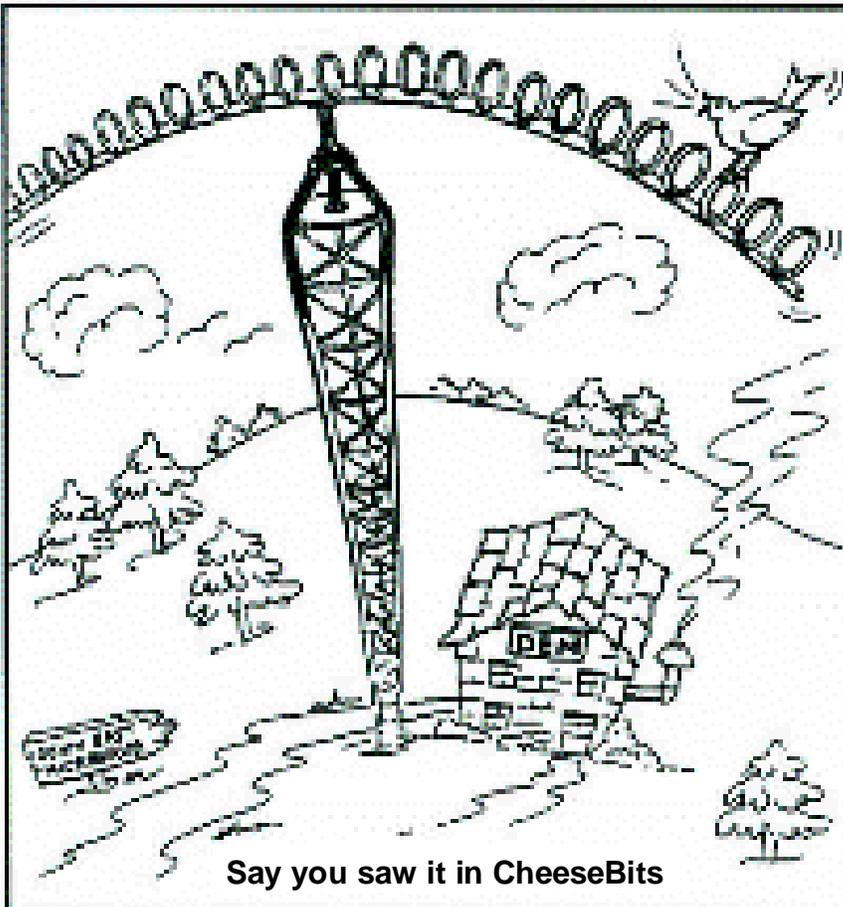
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**MEETING
NOTICE**



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