MT. AIRY V.H.F. RADIO CLUB, INC.

# CHEESE BITS

PACK RATS

**W3CCX**

CLUB MEMORIAL CALL

ARRL Affiliated Club

VOLUME XXXVIII | September 1996 | Number 9

## THE PREZ SEZ

The Packrat Picnic was held at Peace Valley Park in perfect summer weather. At last count 27 club members plus family attended, including representatives from Delaware and New Hampshire. The food was great and the company couldn't be beat. The only casualty was the infamous Rat Roaster which was put into retirement shortly after the June contest. Rumor has it that whatever was in the 55 gal drum before it became a broiler thinned the skin a bit and the Roaster has finally rusted through. Don swears it had nothing to do with his secret barbecue sauce! But not to worry, our official Packrat chefs de cuisine are prepared for every eventuality and showed up with a nifty fold up portable grill. Thanks to Don, N3OZO and Al, N3ITT for all their efforts and of course thanks to all of the members who shared their Saturday afternoon with us.

Where did the summer go! Here it is Labor Day already and almost all of the things I planned to do this summer are still unfinished. The Conference and Hamarama are only a month away and before you know it the January contest will be just around the corner. It's time to get serious about those antenna and tower projects before it's too late! No one is ever going to knock on your door and offer to work on your tower. But if YOU ask for help I can guarantee that the members of this club will pitch in and do whatever they can. The Packrats have a 40 year legacy of helping each other and that tradition is just as strong today. The first step is preparation. Plan the job, make sure you have all of the required materials. Do as much of the round work as possible. The time to put connectors on the cable is not when the help shows up at your front door! When you're ready, put out the call! Let people know you're looking for help on the Monday night nets, or at the club meeting, or contact one of the club officers. Asking for help is no disgrace, doing nothing is.

After two enjoyable outdoor meetings, the end of summer signals our return to the Southampton Free Library meeting site. Mario's raffle and the back of the room silent auction should be loaded with good items since many of us have been busy cleaning up our shacks. Our VP (N3AOG) has lined up an interesting speaker from Penn State University who will give a presentation on the medical aspects of microwave radiation. (Lead-lined underwear will go on sale in the hallway immediately after the meeting.) Plan to attend, and bring a friend.

73, Phil WA3NUF

IN MEMORIUM
John Allen, SILENT KEY 1916 -1996

**MEETINGS**

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

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**SUBSCRIPTION/ADVERTISING MANAGER:**
Bob Fischer, WB2YEH
7258 Walnut Avenue
Pennsauken, NJ 08110
(609) 665-8488

**EDITOR:**
Harry Brown, W3IIT
3012 Potshop Road
Norristown, PA 19403
(610) 584-4846
hbrown@vf.lmms.lmco.com
hbrown@newtech.net

**CLUB TREASURER:**
Dave Mascaro, WA3JUF
1603 Mink Road
Ottsville, PA 18942
(215) 795-2648
dmascaro@gic.gi.com

**AWARDS CHAIRMAN:**
Bob Fox, W3GXB
(610) 346-8698

**TRUSTEE OF CLUB CALL - W3CCX**
Ron Whitsel, WA3AXV
rwhitsel@aol.com
(215) 355-5730

**PACKRAT 222 MHz REPEATER - W3CCX/R**
222.98/224.58 MHz, Churchville, PA FN20LE

**OFFICERS: 1995-1996**

| | | |
|---|---|---|
| PRESIDENT: | WA3NUF | Phil Miguelez, pmiguelez@gic.gi.com |
| VICE PRES: | N3AOG | Dick Comly |
| REC. SECR: | WA3AQA | Walter Zumbach |
| TREASURER | WA3JUF | Dave Mascaro, dmascaro@gic.gi.com |
| COR. SECR: | KB3XG | John Sorter, JohnKB3XG@aol.com |
| DIRECTORS: | N3DQZ | Jack Kauker (2 YRs) |
| | WA3AXV | Ron Whitsel (2 YRs) |
| | N3OZO | Don Schwartzkopf (1 YR) |
| | WB3KRW | Steve Dallas (1 YR) |

**MONDAY NIGHT NETS**

| TIME | FREQ. | NET CONTROL |
|---|---|---|
| 7:30 PM | 50.150 MHz | K3EOD |
| 8:00 PM | 144.150 MHz | AA2UK |
| 8:30 PM | 222.125 MHz | WB2YEH |
| 8:30 PM | 224.58R MHz | N3ITT |
| 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: WA3AXV | 215-355-5730 |
| HAMARAMA: WB3JYO | 609-538-1687 |
| VHF CONFERENCE: KB3XG | 610-584-2489 |

**PACKRAT BEACONS - W3CCX/B FM29JW**

| | |
|---|---|
| 432.298 MHz | 903.071 MHz |
| 1296.262 MHz | 2304.034 MHz |

## Calendar of Coming Events - September 1996

| | |
|---|---|
| 2 | Birthday on Hiram Percy Maxim, W1AW on Sept. 2, 1869. |
| 2 | **Labor Day** |
| 8 | **39th Annual F.A.R. FEST (Gaithersburg Hamfest)** will be held at the Montgomery County Agricultural Center (Fairgrounds) in Gaithersburg, MD. TI on 146.955. VE Exams. |
| 12 | Mt. Airy VHF Radio Club **Board of Directors meeting** will be held at the QTH of Ron, WA3AXV. Call 215-355-5730 for directions. Directors and all interested parties are welcome. |
| 14 | **Rosh Hashanah** |
| 14-16 | **September VHF QSO Party**. Starts 1800 UTC Sat. and continues thru 0300 UTC Mon. See Aug. QST, page 102 for rules. Get on and at least give out a few points. Participation Pins available for everyone making 25 or more contacts. |
| 15 | **Delaware Valley Radio Assn Hamfest** will be held at Tall Cedars of Lebanon picnic grove on Sawmill Rd. in Hamilton Township NJ. TI on 146.67-. |
| 19 | **First indoor meeting** of the fall season of the Mt. Airy VHF Radio Club will be held at the Southampton Free Library on Street Road in Southampton, Pa, All members and interested VHFers are invited to meet and share with us. |
| 21-22 | **ARRL 10 GHz and UP Cumulative Contest**. See June QST, page 107 for the rules. |
| 22 | 47th Annual **SJRA Hamfest** at the Mt. Holly Armory, Exit 40A odd I-295N, E on Rte 38 in Mt Holly NJ. VE Sessions. Talk-in on 144.69/145.29. |
| 23 | **Yom Kippur** |
| 24 | **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. |
| Oct. 5 | The **20th Annual Mid-Atlantic VHF Conference** will be held at the Quality Inn in Horsham, PA. Admission $10 in advance or $10 at the door (includes HAMARAMA). For further info, contact the Conference Chairman, John Sortor, KB3XG, 215-584-2489.The **Pack Rats Hamarama and VHF Conference Webpage** can be found at URL http://uhavax.hartford.edu/~newsvhf/hamarama.html thanks to Ron WZ1V. |
| 6 | **Hamarama 96** will be held at the Bucks County Drive-In on Rte. 611, In Warrington, Pa. |

## SILENT KEY - John W. Allen, Jr. 1916-1996

By Ernie Kenas, W3KKN

A member of the Packrats since their early days, John grew up in the Glenside area and went to Abington High School. He was a member of the school radio club, it was here many of us got our start in ham Radio.

John was an avid ham which led to his electronics career. He was an Electronics Instructor in the Signal Corps during World War II. After the war, he worked at Barker & Williamson and then Narco as a design engineer on aircraft electronics. Early on, he was an antenna enthusiast. In the middle thirties, I heard him on ten meters with a new novel antenna at that time (a yagi beam) working the world. He experimented with many kinds of antennas and gave us practical engineering for loop yagi's which are now the vogue for UHF work.

John had a loving family - wife Loretta, daughters Lorette and Carol. John's other hobbies were playing the organ, fishing and swimming. Many happy hour I spent with him trout fishing in Northern Pennsylvania. He also loved animals and always had a pet dog or cat.

John was a true Packrat and was helpful to all members of the club. We'll remember John for his smile, his kindness and his expertise. He will be sorely missed.

So long John - 73 - CUL.

# PACK RATS

## THE MT. AIRY VHF RADIO CLUB, INC.

PRESENTS

# HAMARAMA

## SUNDAY, OCTOBER 6th, 1996

rain or shine

Gates open — Buyers: 7:00 a.m. — Sellers: 6:00 a.m.

# Bucks Cnty DRIVE IN

### Warrington, PA

Food, beverages & facilities on site — **SORRY, NO OVERNIGHT PARKING**

**ADMISSION:** $5.00 **SELLERS ADD:** $8.00 per space

**TALK-IN: 146.52** (Simplex)

## 20th Annual Mid Atlantic States VHF Conference

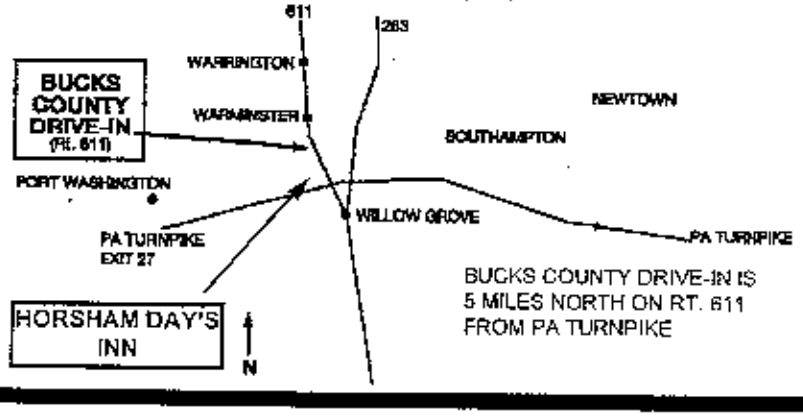
**Saturday, 5 October, Horsham Day's Inn 9 AM to 9 PM**

Call: (215) 674-2500, mention Packrats or "PCKRTS9" for a discount rate of $69.00 per room

Tentative Presentations by Del, KD1DU on "Introduction to 10 GHz", Jim, WB6UN on "Amateur Satellite Communications at Microwave Frequencies", Jim, AI3K on "3 D Linear Analysis Software", Gary, WA1YHO on "Using YO and AO to Optimize 6M Antenna System", N1DPM and WA2TEO on "Elmers", Harvey Kaylie of Mini-Circuits Labs , Gene, W3ZZ on "40 years of Contesting", etc.

Banquet at 7 PM.

All Motels: Marriott Willow Grove: (215) 830-0550/
Hampton Inn, Willow Grove, (215) 659-3535/Warrington Inn, (215) 343-0373




**FOR INFORMATION:**
24 Main Blvd.
Trenton, NJ 08618

## Preliminary Agenda and Speakers - 20 th Annual Mid-Atlantic States VHF Conference

By: John, KB3XG

The Mid Atlantic States (PackRats) VHF conference will be held at the Horsham> Days Inn in Horsham, PA just north of Philadelphia, on Saturday, Oct. 5, 1996. On Sunday, the PackRats' Hamarama Hamfest will be held at the Bucks County Drive-in a few miles north in Warrington, PA. For more information contact John Sortor, KB3XG, Conference Chairman, at 1214 N. Trooper Rd., Norristown, PA 19403, or call (610) 584-2489 or send e-mail to JohnKB3XG@aol.com.

Special conference rates at Horsham Days Inn. Reservations (215) 674-2500 or fax (215) 674-0145. Room rate $69 per room, 2 persons, 2 beds. The 800 number for Days Inn will **not** guarantee the group rate of $69. Group rate cutoff date 19 SEPT 96. Must mention group code "PCKRTS9" or "Pack Rats" for group rate. Other hotels: Holiday Inn Trevose (215) 364-2000, Marriott Willow Grove (215) 830-0550, Hampton Inn Willow Grove (215) 659 - 3535, Warrington Inn (215) 343-0373.

| SPEAKERS | TOPICS |
|---|---|
| KD1DU, Del | Introduction to 10 GHz Equipment and Operation |
| WB6JJN, Jim | Amateur Satellite Communications at Microwave Frequencies |
| AJ3K, Jim | Sonnet Software, 3-D Linear Analysis |
| WA1YHO, Gary | Using YO & AO to Optimize a 6M Antenna System |
| N1DPM / WA2TEO | Elmers |
| Harvey Kaylie, | Mini-Circuits Labrotories |
| W3ZZ, Gene | 40 Years of Contesting |

**Preliminary schedule of events:**

Friday, October 4, 1996

5pm to 11pm - Out of town guests arrive, check in. The 2 meeting rooms be used as a hospitality suite. The Pack Rats will provide snacks & beverages

Saturday, October 5, 1996

9am to 5pm Morning conference session.
12pm to 1pm Lunch break
1pm to 5pm Afternoon conference session.
5pm to 7pm Hospitality suite.
7pm to 9pm Dinner/Banquet
9pm to 11pm Hospitality suite.

Sunday, October 6, 1996

6am to 10am Check out
7am to 3pm Hamarama at the Bucks County Drive In

73, John Sortor, KB3XG

home (610) 584-2489 voice mail (610) 878-5674
fax (610) 878-7841 email JohnKB3XG@aol.com

## TID BITS

**Sept. Meeting Speaker:** C. Stuart Nelson from Penn State University, Dept. of Nuclear Engineering, will speak on: "THE HEALTH EFFECTS OF EMFs & MICROWAVES"

The August issue of **Rocky Mountain VHF**+ reproduced Gary, WA1YHO's Cheesebits article "Using Yagi Optimizer to Desigh the New W3CCX 6M Antenna".

John, **KB3XG**, just passed the test for his commercial pilots license.

Brian, ND3F reports via the VHF Reflector that a **"2 meter Activity Night"** has been started in the Baltimore/Washington area. The net will be on 144.205 MHz starting at 8 PM local time. All are invited.

A separate **Six Meter Reflector** has been established by Mike, KS0F. It covers all aspects of Six Meter operation (no other bands). To subscribe, send an e-mail message addressed to majordomo@il.net. No subject entry is required. In the body of the message type: subscribe six-list@il.net <your email address> That's all that is required.

Ken, KP4XS reports a **new beacon in EM84.** The EM84 beacon is now operational. Here are the specifics:Transmit power out-20 watts (for now) Frequency-144.296.5 as heard on USBBeacon Message- CW at about 13wpm? Text= "VVV de KP4XS/W4 EM84xp"Azimuth- 40 degrees with a theoretical beamwidth of about 60 degrees. This will cover the NorthEast.Feedline- Andrews FSJ4-50 (40ft) spliced with Flexi 4xl(9913) (40ft)

## VHF+ NEWS & ACTIVITY

By Jerome Byrd, K3GNC

"SUMERTIIIMME, WHEN DX IS EEEEASY, METEORS ARE POPPING, AND THE TROPO IS HIIIIGH, DX GRIDS ARE RICH, AND LONG-HAUL PROSPECTS GOOD-LOOKING. SO HUSH VHF+ DXER AND DON'T ON'T YOU CRYYYYY"

**ON THE BANDS:**

August has shown good tropo (no wet noodle nights yet) and good activity. More and more IC-706's are showing up. If we get 25% of them to get good horizontally polarized beams and a preamp and a brick, the January 1997 Contest may break a few records! There is still a little life in 6 meters (see report below) and local enhancement allows me to work WA2LTM - KA1OTP (FN41) almost every night on 1296.98.

I won the 1995 Sept. contest award for EPA. I want another one this year. Is everyone going to sit around and wait for January, or is someone going to stop me in this years" Sept. contest! (Sept. 14th-16th).

REPORTED 6 METERS EUROPEAN OPENINGS: August 12th, around 2000z a massive opening to most of Europe. This VERY LATE in the year for such a opening. Our own WC2K (Rick) - FM29, was alerted by Ten Meters, that Six Meters may be open. Rick worked 22 contacts in an hour or so. The following is a PARTIAL SELECTION of the wide sweeping

activity as reported by Rick: EH1TA, G1URJ, I3KKH, CT1DIN, GW4VEQ, EI3EBB, F5JKK, S57A, ON4ANT... WOW!

REPORTED ACTIVITY: (I am only reporting specific contacts (144 AND UP) (that are reported to me, or my own )

| Date | Call | Grid | Band | Propagation | Station |
|---|---|---|---|---|---|
| 08/03/96 | KH6CP/1 | FN33 | 5.6 GHz | TROPO | AA2UK! |
| 08/04/96 | W2SZ/1 | FN32 | 5.6 GHz | TROPO | WB2JHG! |
| 08/15/96 | W4VHH | EM95 | 2.3 GHz | TROPO | AA2UK |
| 08/19/96 | WA8WZG | EN81 | 2.3 GHz | TROPO | AA2UK |
| 08/20/96 | W1REZ | FN55! | 144 | TROPO | K4QIF(FM06)! |
| 08/22/96 | VE3EYR | EN92!! | 432 & 1296! | TROPO | AA2UK |
| 08/22/96 | N8TUH | EN81 | 144 | TROPO | AA2UK |
| 08/22/96 | KB8RJS | EN82 | 144,432 | TROPO | AA2UK |
| 08/23/96 | W4VHH | EM95 | 144,432,1296,2.3 | TROPO | AA2UK |
| 08/23/96 | W4VHH | EM95 | 1296 | TROPO | K3GNC |
| 08/23/96 | N4MSW | EM93 | 144 | TROPO | AA2UK |
| 08/23/96 | W4OXA | EM93 | 144 | TROPO | AA2UK |

A lot more stations were worked in grids FN03,EN91,EN81,FN02 by AA2UK (a few by K3GNC) on 144, but I won't mention them specifically. Bob, W3GXB was in there making contacts on 08/22/96, also the 08/22-23 contacts were in the AM around 1330-1430Z.

**WHERE OH WHERE IS CARMEN SANDIEGO?**

N4HB, VE3ASO, KA3FZF, N8PEK, VE3ASO, VE3ASO, VE3ASO..

**LET LOOSE THE DOGS OF WAR:**

Congratulations to Bill, AA2UK and MARK, WB2JHG for their great scores in the UHF contest this year. Mark is now on 8 bands! Dave, K1RZ will be returning as a single-op in the Sept. contest I know all of you fighting to make the "TOP TEN' are very happy. WZ1V is sporting one of two planned14's. He sounds as loud as he did with the 33 foot monster.

## CHEESEBITS SUBSCRIPTIONS

Cheesebits subscriptions are available to everyone interested in activities and information from the VHF thorough the microwave frequencies. Subscriptions are for 1 year of 12 issues. For a subscription, send the following information:

Name:_____Call:_____

Street Address:_____

Town:_____ State:_____ ZIP:_____

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

September 1996

Send to: SUBSCRIPTION/ADVERTISING MANAGER:
Bob Fischer, WB2YEH
7258 Walnut Avenue
Pennsauken, NJ 08110

## ARLL Bulletin 050 New RF standards

From ARRL HeadquartersNewington CT August 6, 1996

New FCC RF safety standards effective January 1, 1997, could affect the way some hams operate, perhaps especially those using vehicle-mounted antennas. As a result of a Report and Order adoptedby the FCC on August 1 (ET Docket No. 93-62, Guidelines for Evaluating the Environmental Effects of Radio frequency Radiation),Part 97 will require hams running more than 50 W PEP to conduct routine RF radiation evaluations to determine if RF fields are sufficient to cause human exposure to RF radiation levels in excessof those specified. "Measurements made during a Commission/EPA study of several typical amateur stations in 1990 indicated that there may be some situations where excessive exposures couldoccur," the FCC said in ending the blanket exemption for Amateur Radio. Amateur operation at power levels of 50 W PEP or less is "categorically excluded" from the exposure requirement in most cases. Where routine evaluation indicates that the RF radiation could be in excess of the limits, "the licensee must take action toprevent such an occurrence," the Report and Order stated. The FCC said this could mean altering operating patterns, relocating theantenna, revising the station's technical parameters--such as frequency, power or emission type--or "combinations of these and other remedies."

"Exactly what is involved in conducting a 'routine RF radiationevaluation' is not yet clear," observed ARRL Executive Secretary David Sumner, K1ZZ, adding that the FCC has promised to release a revised OST/OET Bulletin Number 65, "Evaluation Compliance with FCC-Specified Guidelines for Human Exposure to Radio frequencyRadiation." The League is now studying the 100-plus page docket, to see if the League should seek reconsideration of any aspects of theFCC decision. Sumner noted that the FCC expects it will not be difficult for most amateur stations to show that the specified limits will be met.

In the Report and Order, the Commission adopted Maximum Permissible Exposure (MPE) limits for electric and magnetic field strength and power density for transmitters operating at frequencies from 300 kHzto 100 GHz. These MPE limits are generally based on recommendations of the National Council on Radiation Protection and Measurement(NCRP) and, in many respects, are also generally based on theguidelines issued by the Institute of Electrical and Electronics Engineers Inc (IEEE) and subsequently adopted by the AmericanNational Standards Institute (ANSI) as an ANSI standard (ANSI/IEEEC95.1-1992). The Commission used the 1992 ANSI/IEEE standards instead of the 1982 ANSI standards that had formed the basis for the existing rules under which Amateur Radio stations were categorically exempted.

Sumner said that for high-power mobile operation and for operation with indoor antennas, particularly in apartment buildings and other situations where there is "uncontrolled exposure" to neighbors and the general public, "amateurs may well have to make changes in how they operate." He said the ARRL Lab staff and the RF SafetyCommittee will be evaluating the new requirements.

The new regulations also will require the addition of five questions on RF environmental safety to the amateur examinations for Novice, Technician, and General-class elements 2, 3(A) and 4(B). Sumner noted that the Commission's Report and Order does not take into account the practical problems associated with such a significant revision to the volunteer-administered amateur examinations, and that more time than the Commission has allowed will be required todo a good job.

The Commission acknowledged the updated guidelines generally are more stringent than the current rules but said that the new rules will protect the public and workers from strong RF emissions.Adoption of new rules by August 6 was required by the Telecommunications Act of 1996.

The FCC encourages the amateur community "to develop and disseminate information in the form of tables, charts and computer analytical tools that relate such variables as operating patterns, emission types, frequencies, power and distance from antennas." TheCommission said it intends to provide "straightforward methods for amateur operators to determine potential exposure levels" by year's end

In comments filed earlier with the FCC, the ARRL strongly opposedadoption of the new requirements. The ARRL said most Amateur Radio users do not possess the requisite equipment, technical skills, and/or financial resources to conduct an environmental analysis. TheLeague has, for several years, recommended a policy of "prudent avoidance" of exposure to electromagnetic radiation as a common-sense approach to potential--but not yet proven--health hazards and against such practices as running high power to indoor antennas or to mobile antennas that might expose the vehicle's occupants. The ARRL also argued that amateur stations, because of their intermittent operation, low duty cycles, and relatively lowpower levels, rarely exceed the 1992 ANSI/IEEE standard. Finally,the ARRL noted that unlike other radio services, RF safety questions already are included in amateur license examinations. But the FCC expressed concern that Amateur Radio operations "are likely to belocated in residential neighborhoods and may expose persons to RF fields in excess of the MPE guidelines."

For now, the League advises hams not to panic and to read up on thesubject. You can download the complete Report and Order by pointing to http://www.fcc.gov/Bureaus/Engineering_Technology/Orders/fcc96326.txt. Other resources are available on the ARRLWeb page at http://www.arrl.org/news/rfsafety/

General information on RF safety is available in the safety sections of The 1996 ARRL Handbook and in the 15th edition of The ARRLAntenna Book. These materials offer guidelines on how to comply with the ANSI standard referred to in the Report and Order

# THE SKY IS NOT FALLING

By Wayne Overbeck, N6NB,

I understand that some concerns have been expressed here aboutthe FCC's Report and Order in the RF safety proceeding, which was released August 1.

As a supporter of the FCC's new rules (and a longtime VHF-UHFenthusiast), I want to say something: I don't think the sky is falling.

I was present when the FCC and EPA conducted their surveyof RF fields at amateur radio stations in 1990. Let me say emphatically that the fields at typical HF and VHF-UHF amateur radio stations are nowhere near the levels proscribed in the new rules. At my own station, even when I fully telescoped my LM-470 to 25 feet, the fields inside the house and around the neighborhood were below the newly adopted standards on all bands. With the LM-470 fully extended, the readings on the FCC's high-priced instrumentation were miniscule! The same results were obtained at the homes of several other hams who run the legal limit and large antennas.

The only installations that approached the FCC's new limits were stations that combined moderate or high power and antennas within a few feet of the operator, family members or neighbors. Examples or problem installations:

*100 watts into a 146 MHz whip on the roof of a car, with people leaning against the car (or in some cases, sitting in "hot spots" in the near field inside the car).

*500 watts into a 5-element 50 MHz yagi on a 20' mast mountedon a van (which produced fields exceeding the standard at ground level about 20 feet in front of the antenna, although the fields inside the van were safely below the standard).

*VHF-UHF antennas mounted in the attic of a condominium, driven by 100 to 1000-watt transmitters (fields exceeded the standard in some places below the antenna, probably including some areas in neighboring condos).

*The FCC/EPA team didn't measure the fields at any of the biggest VHF-UHF moonbounce stations (no owner of such a station volunteered to take part in the survey). However, a 144 MHz e.m.e. station running 1500 watts into a 24 dBd antenna array (i.e., roughly 300,000 watts e.r.p.) could well generate an RF field in a nearby house that would exceed the standard. That is why most e.m.e. operators are careful to avoid pointing a ground-mounted array at the horizon if there are people nearby in the line of fire.

The van used in the 500-watt six-meter tests described above was mine. It's a VHF-UHF contest vehicle capable ofhigh power all the way up to 1296 MHz. I have used it at full power many times since the FCC/EPA team measured the fields, but only in remote areas where there aren't any people wandering around in front of the antennas. Under the new FCC rules, it will still be legal to use a van-mounted station like this one as long as the owner takes common sense precautions. For example, it's not the station of choice to demonstrate amateur radio at the county fair!

I'm sure none of us would defend amateur radio operations that expose unknowing people to RF fields exceeding the standards recommended by leading technical organizations such as IEEE, with or without an FCC rule

Why, then, is an FCC rule needed? It is needed because many amateurs have been unaware of the potential hazards of RF fields and would have remained so if this rule had not been adopted. All the FCC is really asking amateurs to do is learn about this and make certain that their own stations adhere tosome basic principles of RF safety.

Research into the health effects of athermal RF and low frequency fields has perhaps reached the point where research into the health effects of smoking was 32 years ago, when the first Surgeon General's report was released. While there are still many unanswered questions about RF safety, organizations such as the IEEE and the National Council for Radiation Protection and Measurement are not hooting at the moon in recommending standards for public and occupational exposure. There ARE biological effects of RF energy.

Let's just say that when the health questions involved here are better understood, it turns out that RF fields exceeding the current standards pose health hazards for just a small partof the population. Wouldn't the FCC's new rules, which will pose only a minor inconvenience for most of us (while greatly increasing awareness of the operating practices that should be avoided), be justified even if they save only a few lives? And what if it turns out that the health hazards are more serious than we now realize? This is not just a matter of protecting amateurs from themselves; the FCC acted because some amateurshave in fact exposed their families and neighbors to RF fields that leading standard-setting organizations consider unsafe.

The new rules will NOT force most amateurs to modify their stations. The FCC's own measurements of RF fields at amateur radio stations demonstrated that most of us can easily comply with the rules. Also, as a former communication attorney I seriously question the suggestion that these rules will cause angry neighbors to file a bunch of lawsuits.No sane lawyer is going to take such a case on a contingent fee, and darned few neighbors can afford most lawyers' hourly rates. Besides, our neighbors don't even know about this: it's been virtually ignored by the popular press.These are some of the considerations that led me (and othermembers of the former ARRL Bio-Effects Committee) to support the FCC's proposed rules in Docket 93-62. I recently wrote a short summary of what Docket 93-62 actually says. I'm attaching that summary to this message.

## A SUMMARY OF DOCKET 93-62

By: Wayne Overbeck, N6NB, 8/3/9

Here are some highlights of the amateur radio portion of ETDocket No. 93-62, approved by the FCC on Aug. 1, 1996:

1) Amateur radio stations will no longer be categorically exempt from complying with the FCC's RF safety standards. However, individual amateurs will not be required to perform the complex environmental assessments that are required of many other FCC licensees

.2) The standards for RF safety that amateurs (and other FCC licensees) will be required to meet are a combination of the 1992 ANSI/EEE standards and somewhat stricter standards developed by the National Council for Radiation Protection and Measurement. The standards establish limits for human exposure to RF fields; the permissible field strength (or "power density") varies by frequency. The lowest power density is allowed in the 30-300 MHz range. At those fre-quencies, the exposure limit is 1.0 milliwatt per square centimeter in "controlled environments" (averaged over any six-minute period) and 0.2 milliwatts per square centimeter in "uncontrolled environments" (averaged over any 30-minute period). Amateurs' own households will fall under the standards for controlled environments, while RF fields in other areas such as neighbors' homes must not exceed the stricter limits that apply in uncontrolled environments.

3) Amateurs whose output power exceeds 50 watts will be required to evaluate their station configuration (including power output, antenna gain, frequency, proximity of the antenna to inhabited areas, and duration of transmissions) to assure compliance with the new rules.

4) The FCC will publish charts and tables to help amateurs determine that their installations and operating parameter comply with the rules. There will be examples showing safe distances from various kinds of antennas with various combinations of frequency, power output and transmission duration.

5) Five questions concerning RF safety are to be added to each of three amateur radio examination elements (elements 2, 3A and and 3B). Application forms for new licenses and renewals will require amateurs to certify that they have read and understand the new RF safety requirements.

6) As a practical matter, the new rules will NOT require most amateurs to modify their stations. The FCC conducted a survey of RF fields near amateur radio stations in 1990 and concluded that only a few station configurations may result inexposures that would exceed the new standards. Potential problem are as may include high power mobile installations, antennas located indoors or close to neighbors' units in apartments and condominiums, and high power VHF-UHF stations using very high gain antennas near populated areas (e.g., a moonbounce array pointed toward an adjacent house).

## RF Exposure limits

Via Ron Marosko , kk5dk from the Contest Reflector

Does your Alpha put out more than 50 watts PEP? If so, you'll be interested in this.

At the FCC Open Meeting on Thursday, August 1, the Commission>adopted a Report and Order in ET Docket No. 93-62 concerning Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation.

Section 97.13 is amended by adding paragraph (c) to read as follows: 97.13 Restrictions on station location.

(c) Before causing or allowing an amateur station to>transmit from any place where the operation of the station>could cause human exposure to levels of radiofrequency (RF) radiation in excess of that allowed under 1.1310 of this>chapter, the licensee is required to take certain actions. A routine RF radiation evaluation, as discussed in 1.1307(b) of this chapter, is required if the transmitter power exceeds 50>watts peak envelope power; otherwise the operation is>categorically excluded from routine RF radiation evaluation>except as specified in 1.1307(c) and

1.1307(d) of this chapter. Where the routine evaluation>indicates that the RF radiation could be in excess of the limits contained in 1.1310 of this chapter, the licensee must take action to prevent such an occurrence. Further information on evaluating compliance with these limits can be found in the FCC's OST/OET Bulletin Number 65, "Evaluation Compliance with FCC-Specified Guidelines for Human Exposure to Radio frequency Radiation."

3. Section 97.503 is amended by revising paragraphs (b)(1), (b)(2), and (b)(3), and adding paragraph (c)(10) to read as follows:

97.503 Element standards.

(b)

(1) Element 2: 35 questions concerning the privileges of a Novice Class operator license. The minimum passing score is 26 questions answered correctly.

(2) Element 3(A): 30 questions concerning the privileges of a Technician Class operator license. The minimum passing score is 22 questions answered correctly.

(3) Element 3(B): 30 questions concerning the privileges of a General Class operator license. The minimum passing score is 22 questions answered correctly.

| (c) * * * Topics: | Element: 2 | 3(A) | 3(B) | 4(A) | 4(B) |
|---|---|---|---|---|---|
| >(10) Radiofrequency environmental safety practices at an amateur station | 5 | 5 | 5 | 0 | 0 |

Table 1. Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field Strength (A/m) | Power Density> (mW/cm2) | (minutes) |
|---|---|---|---|---|
| 0.3-3.0 | 614 | 1.63 | (100)* | 6 |
| 3.0-30 | 1842/f | 4.89/f | (900/f2)* | 6 |
| 30-300 | 61.4 | 0.163 | 1.0 | 6 |
| 300-1500 | -- | -- | f/300 | 6 |
| 1500-100,000 | -- | -- | 5 | 6 |

f = frequency in MHz

* = Plane-wave equivalent power density

(B) Limits for General Population/Uncontrolled Exposure

| Frequency Range (MHz) | Electric Field Strength (V/m) | Magnetic Field> Strength (A/m) | Power Density (mW/cm2) | (minutes) |
|---|---|---|---|---|
| 0.3-1.34 | 614 | 1.63 | (100)* | 30 |
| 1.34-30 | 824/f | 2.19/f | (180/f2)* | 30 |
| 30-300 | 27.5 | 0.073 | 0.2 | 30 |
| 300-1500 | -- | -- | f/1500 | 30 |
| 1500-100,000 | -- | -- | 1.0 | 30 |

f = frequency in MHz

* = Plane-wave equivalent power density

NOTE 1 TO TABLE 1: Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2 TO TABLE 1: General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their>employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

## Free Near-Field Analysis Software

By: Brian Beezley, K6STI, from the VHF Reflector

As a result of the recent FCC ruling that mandates RF-exposure limits for amateur stations beginning January 1, 1997, I'm making available at no cost a special version of AO Antenna Optimizer software that calculates electricand magnetic near fields. NF.EXE requires a 386 or better, mathcoprocessor, VGA, and DOS 3.0 or later.

You can download the 245K NF.ZIP file from ftp://n6nd.nosc.mil. You may copy this free software for others as long as no charge is involved and the software is used for amateur purposes only. After you unzip the file, see READ.ME for more information. Please carefully read the section on accuracy limitations of near-field modeling.

I hope this software helps hams evaluate their stations for compliance with the new FCC rule. The software should be especially useful at high-power contest, DX, and EME stations. I'm providing this free software without support.The package includes extensive documentation and 92 example antenna files. I hope you'll refrain from calling, writing, or e-mailing questions about downloading or using thesoftware.

Editors Note: You can also download the program from Tom, N2DKP's web page at http://home.eznet.net/~tmeng/index.html or for those without this capability, send the editor a 3.5 in. disk and an SASE and I will send you a copy (address on page 2 of Cheesebits).

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Cheese Bits
3012 Potshop Rd.
Norristown, PA 19403

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DICK HUNTZINGER
W3FQD
130 FAIRHILL RD.
CHURCHVILLE, PA 18966

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