# W5YI

**Nation's Oldest Ham Radio Newsletter**

# REPORT

Up to the minute news from the world of amateur radio, personal computing and emerging electronics. While no guarantee is made, information is from sources we believe to be reliable. May be reproduced providing credit is given to The W5YI Report.

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★ *In This Issue* ★




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## FCC SEEKS CLUB CALL SIGN ADMINISTRATORS

On June 1st, the FCC released a Public Notice entitled ***"Call for Club and Military Recreation Station Call Sign Administrators."*** The purpose of the bulletin was to alert the public to the fact that the Commission was accepting applications from organizations wishing to issue club and military recreation amateur radio call signs. The Public Notice reads: (Quote)

*"On May 11, 1993, the Commission adopted an Order (FCC 93-249) that authorizes it to use volunteer organizations for the purpose of providing amateur service club and military recreation station call signs.*

*"In the Order, the Commission delegated authority to the Chief, Private Radio Bureau, to execute agreements with qualified organizations that desire to provide services to the Commission as a club and military recreation station call sign administrator.*

*"The purpose of the Public Notice is to announce that the Chief, Private Radio Bureau, will accept requests from organizations interested in becoming an administrator beginning July 26, 1993. Requests received before this date will not be considered. Organizations interested in becoming an administrator should familiarize themselves with the Commission's Order before applying.*

*"Each organization requesting designation as an administrator must provide the information specified in Section 97.29 of the Commission's Rules, 47 C.F.R. §97.29 (a) through (k). Additionally, the organization must include a listing of the twenty-six possible call sign blocks (NA through NZ) in descending order of preference.*

*"Requests will be processed in the order received at the address given below. Each administrator will be assigned the first available block of call signs based on its preference listing.*

*"All requests must be signed by a responsible official of the organization and include the telephone number of a person familiar with the request. Requests must be sent to the Federal Communications Commission, Personal Radio Branch, Room 5322, Mail Stop 1700 C1, Washington, DC 20554, ATTENTION: CALL SIGN ADMINISTRATOR. Failure to follow these filing procedures will result in the request not being considered.*

*"At a future date, we will announce by Public Notice the names and addresses of organizations that have been certified as a club and military recreation call sign administrator.*

*"For further information, call Maurice J. DePont at (202) 632-4964."* (End Quote)

The new Rules pertaining to the assigning of club and military recreation call signs were added to Part 97 on May 11, 1993, and released to the public on May 19, 1993. The regulations are effective July 19, 1993. The new Rules read


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as follows:

*(Following sentence added to §97.17(b)*

**§ 97.17 Application for new license**

(b) Each application for a new amateur service club or military recreation station license must be made on FCC Form 610-B.

*(Following sentence added to §97.19(b)*

**§ 97.19 Application for a renewed or modified license.**

(b) Each application for a modified or renewed amateur service club or military recreation station license must be made on FCC Form 610-B and submitted to the club and military recreation station call sign administrator that provided it.

*Section 97.29 is added to read as follows:*

**§ 97.29 Club and military recreation station call sign administration.**

No organization may serve as an amateur service club and military recreation call sign administrator unless it has entered into a written agreement with the FCC. The FCC will issue public announcements listing the club and military recreation call sign administrators. Each club and military recreation station call sign administrator must abide by the terms of the agreement. Each club and military recreation station call sign administrator must:

(a) Be an organization that has tax exempt status under Section 501(c)(3) of the Internal Revenue Code of 1986 and that exists for the purpose of furthering the amateur service;

(b) Be an organization whose membership includes at least one percent of the amateur operators licensed by the FCC;

(c) Be capable of serving as a club and military recreation call sign administrator in all places where the amateur service is regulated by the FCC;

(d) Accept and process all properly-completed license application Forms 610-B received from qualified club and military recreation station license trustees or custodians and submit them to: FCC, 1270 Fairfield Road, Gettysburg, PA 17325-7245;

(e) Not charge the applicants any fee or accept any form of reimbursement for services provided as an amateur service club and military recreation station call sign administrator;

(f) Accept and process applications from applicants for club or military recreation station licenses, under §97.5(d)(2) and (3) of this Part, without regard to race, sex, religion, national origin or membership (or lack thereof) in any amateur service organization;

(g) Provide the FCC with a license document, including the unique call sign, ready for endorsement and mailing within 10 days of receipt of a properly-completed application for a club or military recreation station license;

(h) Provide the FCC each month, in a format specified by the FCC, a data file of license documents processed during that month;

(i) Issue public announcements detailing the policies and procedures of the club and military recreation station call sign assignment system;

(j) Accept and respond to inquiries concerning club and military recreation station applications and license matters;

(k) Provide the FCC with a plan for processing applications for modified or renewed amateur service club or military recreation station licenses in the event that the organization ceases to function as a club and military recreation station all sign administrator.

## *PAUL GRAUER, W0FIR, DEAD AT 81*

ARRL Midwest Division Director ***Paul Grauer, W0FIR,*** passed away on Saturday, June 5th. Paul (born August 13, 1911 in Winside, Nebraska) had been in failing health for some time.

W0FIR had served as Midwest director for nearly 20 years. His first term in office began on January 1st, 1974. Immediately prior to that he had served as the division's Vice Director. During the Vietnam war, Grauer was an active member of Army MARS and handled hundreds of phone patches for servicemen overseas wanting to talk to their families back home.

At the time of his death, Grauer, a life member of QCWA, operated the Wilson Telephone Company which he owned for the past fifty years. He also sat on the board of two banks, was Chairman of the Ellsworth County Republican Party and a fifty year member of the Wilson Lion's Club.

Paul made his last public appearance on Saturday, May 22nd at the PHD Amateur Radio Club convention in Kansas City. Though obviously in some discomfort, Paul spent the morning at the ARRL booth assisting in any way he could -- the same as he had always done at the many conventions and hamfests he attended over the years.

Only four days earlier (Tuesday, June 1st) Paul had tendered his resignation from the ARRL board

and as president and director of the ARRL Foundation for health reasons. The League immediately made Paul an honorary Vice President and he was to be accorded that honor at the Salina, Kansas, hamfest, on June 6th. He died at his home in Wilson, Kansas, the day before it could be presented to him. It was presented to his wife instead.

Funeral services were held Tuesday, June 8th, at the Wilson Methodist Church. Paul Grauer WØFIR is survived by his wife, Helen NØBCI, three sons, eight grandchildren and six great-grandchildren. Burial was in the Wilson city cemetery. Memorial gifts may be made to the ARRL Foundation.

Vice Director Bill McGrannahan, KØORB, has assumed the office of ARRL Midwest director and will serve out the remainder of Paul Grauer's term.

*HF DATA COMMUNICATIONS PETITION FILED*

A Delaware non-profit Corporation calling itself the ***American Digital Society, Inc.*** (whose members are all amateur radio operators) filed a very professionally produced (19 page) *Petition for Rule Making* on June 2nd with the FCC. Although more restrictive, it seemed to pretty much support the position of the American Radio Relay League. The big difference is that AX.25 packet communications would not be permitted below 28 MHz due to bandwidth restrictions.

The Society said the purpose of their proposal is "...clarify the current rules with respect to unattended semi-automatic control of RTTY and data communications in the high frequency (HF) amateur bands."

The petition, which obviously was prepared by a communications attorney, accurately chronicles the drastic changes in high frequency digital communications that have occurred in recent years. It contends the current rules have not contemplated the newer technologies (such as PACTOR and CLOVER) "..and a modest rule change is required to encourage these and other modes as they become available." These new data protocols require substantially less bandwidth than AX.25 Packet. The petitioners add "...the performance figures for Packet are the poorest per unit of bandwidth of any of the currently used modes."

Here are some observations from the Petition: HF spectrum is very limited ...especially on the 20 and 40 meter bands. "The two oldest modes of operation, voice and CW, use the lion's share of the spectrum in those bands since they were in heavy use before there were any digital modes. ...The digital modes have [been] simply squeezed in the cracks. ...gradual changes will continue to occur ...as a larger percentage of amateurs shift to digital..." Frequency ownership has unfortunately become a practice on certain VHF frequencies, but this practice has never been established on the HF bands.

Both semi and fully automatic digital operation are possible on the HF ham bands. Fully automatic operation is when messages are passed between amateur stations without any operator intervention and no operator necessarily present at either station. The potential for interference is much less using a semi automatic mode. The ARRL has proposed to authorize fully-automatic unattended operation on specific frequencies.

The American Digital Society believes that any amateur station should be allowed to complete HF data communications under semi-automatic control providing such operation does not cause interference to pre-existing, regular communications. A control operator must be present at one of the two stations involved in the communication. Fully automatic operation should either be prohibited on the HF bands or confined to specific subbands as suggested by ARRL.

(1) The rules should be amended to allow unattended semi-automatic operation of digital stations after the control operator monitors the progress of ongoing communications.

(2) The rules should be amended to allow the use of unspecified digital codes for the purpose of efficient data compression and error control on HF.

(3) The bandwidth should be restricted to 500 Hz below 28 MHz and 2 KHz between 28.0 and 28.3 MHz. (Wider bandwidth AX.25 Packet would not be permitted below 28 MHz.)

(4) Current rules concerning interference prevention and abuses are sufficient to inhibit any unlawful operation.

(5) While not rejecting fully automatic unattended operation, the American Digital Society said if it were established, it should be on sub-bands so that all users of those bands would be on notice that their communications could be interrupted.

*ARRL FILES COMMENTS ON HF DATA*

On May 17th, the American Radio Relay League filed comments "...in continued support of its Feb. 1, 1993 *Petition for Rule Making*" relative to high-frequency data communications.

The League said "The proposal for the specification of subbands for [fully automatic unattended operation], to control, or at least limit, interference from automatically controlled stations to other types of amateur HF communications on the same or adjacent

frequencies, remains a necessary element in this first step.

"It cannot be seriously disputed by anyone but that the regulated addition of automatically controlled stations throughout the HF bands would result in harmful interference to other amateur stations, and the disruption of domestic and international amateur communications.

"During peak activity periods the amateur HF bands are crowded with stations, who coexist through mutual respect of one another's equal right to operate, toleration of a certain amount of unintentional interference, and flexibility in operating so as to avoid as much interference as possible. To introduce potentially large numbers of automatically controlled stations into these bands, without restriction, would upset this delicate balance. A cautious approach to introducing automatic control in the HF bands is clearly indicated."

The ARRL also said that an additional accommodation might be that automatically controlled data stations could operate, provided that they are configured to transmit only when interrogated by stations under local or remote control. "By this means, interference would be prevented by virtue of the participation of a live operator at one end of the communications." The ARRL Board will review the merits of this additional authorization at its July Board meeting.

## *NOVICE TEST FEE CONTROVERSY*

As mentioned in our last newsletter, there are big changes coming July 1st involving Novice and Technician ham operator testing. On this date:

(1) New (Element 2) Novice and (3A) Technician question pools will be implemented by the various VECs. (All questions have been revised.)

(2) Novice Class operator license examinations will be folded into the Volunteer-Examiner Coordinator (VEC) System.

(3) Novice examinees must be tested by three General Class or higher level VEC-accredited volunteer examiners.

(4) VEC-accredited General Class VE's may also examine all requirements for the Technician and Tech Plus levels.

Basically the FCC authorization pretty much followed the suggestions of the American Radio Relay League and the W5YI-VEC, the original two petitioners in the matter. The W5YI-VEC petition - and the FCC *Notice of Proposed Rule Making* which was adopted July 13, 1992, both provided for expense reimbursement (a test fee.) The ARRL did not address that matter at all in their proposal.

The Commission believes there is no valid reason to require VEs and VECs who donate their time to absorb the additional cost of providing Novice examinations. The FCC pointed out that the small fee (a current maximum of $5.60) "...has not hampered the growth of the other license classes, for which reimbursement is permitted." While the Report and Order was adopted on May 3rd, the actual text of the Order was not released until May 14th.

In that Order, the FCC responded to a question put to it by the ARRL regarding waivers of the test fee. The FCC said "The examination-by-examination [computation] method allows the VEs and VECs the option of not recovering out-of-pocket costs from any particular examinee. The annual method [which all VECs - including the ARRL-VEC use] does not allow such an option." Actually the annual computation method of expense reimbursement was authorized by the FCC back in 1984 at the request of the League.

The "annual method" involves totalling up all expenses for the prior year and dividing by the number of examinees. Where the amount of the average test fee exceeds the maximum allowable reimbursement, then this amount (currently $5.60) is the most that may be charged at exam sessions during the following year.

The "examination-by-examination method" requires calculating the exact out-of-pocket costs of every test session and then charging each applicant a proportionate share - rather than the maximum $5.60. The maximum allowable amount is adjusted annually based on changes in the Consumer Price Index (inflation.).

On May 8th (and before receiving a response from the FCC relative to their question of waiving test fees), the ARRL made a decision not to charge any test fees for Element 2 (Novice 30 question written exam) and Element 1A (5 wpm code) even if the code test was taken after passing the Codeless Technician requirements. This decision appeared to conflict with the FCC Order.

The W5YI-VEC contacted its Washington DC attorney to determine if it also could waive test fees for the Novice Elements. We were advised that the Order - which was specifically approved by the FCC Commissioners and has the force of law - was clear. We could not. Under the annual method of expense reimbursement accounting, you must charge everyone the same test fee "...because it is premised on accepting reimbursement from each examinee at each session throughout the year." (A quotation from the FCC Order.) At this writing, it is still not clear how the ARRL-VEC will handle test fees for the 5 wpm (Element 1A) and Novice written (Element 2) examinations in view of the FCC Order.

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## *HAM OPERATOR LOSES TOWER APPEAL*

The United States Court of Appeals for the Tenth Circuit has overturned a lower district court decision that would have allowed Boulder, Colorado amateur radio operator ***David R. Evans, NQØI*** to install an eighty-foot crank up tower on his property. The case is significant in that the Federal Appeals Court finds amateur radio towers and antennas to be unsightly - and therefore exempt from the preemption provisions of PRB-1, the 1985 FCC declaration concerning local regulation of amateur radio facilities.

The appeal sprung from a controversy between NQØI and the Boulder County Board of Commissioners about the height of an antenna tower he wanted to install at his home. Evans wanted a 100 foot high tower; the County decided thirty-five feet was sufficient; and the district court ruled eighty feet was just right. The appeals court reversed the lower district court decision.

Evans owns a home on a one acre plus tract in a zoned residential area. The area's principal charm is an attractive panoramic view of the nearby Rocky Mountains. There an be no doubt that people buy in his area because of the view. In order to preserve the view enjoyed by residents, the County imposes a general height limitation of thirty-five feet for structures, a limitation which all parties agree impairs Evans' ability to conduct the radio communications he desires.

Neighborhood residents express concern that the erection of a large metal antenna tower would not only interfere with the superb aesthetic scenery they enjoy, but would also devalue their property. While Evans believes he could alleviate the problem by screening the tower with trees, the trees would not be of sufficient height for at least 10 years.

Evans appealed to the federal district court contending the County's application of its zoning regulations had been preempted by the FCC order, PRB-1. The district court agreed with Evans and held the regulations were invalid as applied. The local Zoning Resolution was indeed preempted by federal law and the County failed to adequately consider Evans' needs for a greater antenna height in violation of PRB-1.

The court then selected one of Evans' four proposed alternatives and ordered the County to approve the application for a special use permit to erect an eighty-foot antenna tower.

NQØ1's neighbors appealed again, this time to the U.S. Court of Appeals. Their reversal contains an interesting perspective on the FCC Regulations:

*"Ever since Guglielmo Marconi erected the first radio antenna, conflicts have arisen between amateur radio operators and local zoning authorities concerning the height of antenna towers. Amateurs radio operators well know their ability to effectively receive and transmit communications directly relates to the height and location of their radio antenna. It is doubtful there exists an amateur radio operator who does not desire a higher antenna. On the other hand, zoning authorities exist, in part, to regulate land use based upon aesthetic considerations. Undoubtedly, most zoning authorities would detest few scenarios more than that of a high steel tower and its attendant guy wires protruding from a residential neighborhood and interfering with a superb mountain view.*

*The FCC, recognizing the inherent and continuing conflict between radio operators and zoning authorities, attempted to resolve the conflict by issuing an order described as PRB-1. They said '...we believe it is appropriate to strike a balance between the federal interest in promoting amateur operations and the legitimate interest of local government in regulating local zoning matters. Local regulations which involve placement, screening, or height of antennas based on health, safety, or aesthetic considerations must be crafted to accommodate reasonably amateur communications, and represent the minimum practicable regulations to accomplish the local authority's legitimate purpose.*

*"The [PRB-1] regulations attempt to strike a compromise between two competing interests and, as is true of many compromises, have omitted the details leaving both sides the impression they received the biggest piece of the divided cake.*

*"Notwithstanding the inherent vagueness in the language, several principles may be gleaned from the FCC regulations. First, zoning authorities must reasonably accommodate amateur communications. Second, local regulations should be the minimum practicable in order to accomplish the zoning authority's legitimate purposes. Third, local authorities may not altogether preclude amateur communications. Finally, the FCC has explicitly declined to regulate the specific permissible heights for antenna towers."*

The appeals court ruled that Boulder County did indeed reasonably accommodate the amateur operator since it was willing to consider the option of a crank-up 60 foot tower. Furthermore, "...complete shielding of the antenna by trees would impact mountain views no less than the antenna itself. ...In this case, denial of the permit after evaluating options and thoroughly considering the relevant evidence was a reasonable accommodation. ...the County's regulations are not preempted [by PRB-1]."

According to Evans, the "crank-up" tower mentioned in the decision was a recommendation by the Land Use Department and was never offered as such by the County. And the court did not mention the restrictions placed on its use: the tower had to withstand 100 mph winds and could only be cranked up and used in the hours between one hour after sunset and one hour before sunrise, or during local emergencies. NQØI told us that "...the Appeals Court held that 'the record is replete with evidence that Boulder County reasonably accommodated Evans' amateur communication goals'. Interestingly, the District Court had concluded that the record was devoid of any attempt by the County to accommodate my needs."

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• *"It is a fact of true amateurs to seek new knowledge and to be skeptical about so-called theoretical limitations. The curiosity and skepticism are the incentives to technical and scientific research, which are the basis of this particular hobby. [Amateurs] view the acquisition of broader knowledge as an amusement"*
*(Excerpted from an IARU Region 1 information booklet explaining amateur radio to the public.)*

## AMATEUR RADIO CALL SIGNS

...issued as of the first of June 1993:

| Radio District | Gp."A" Extra | Gp."B" Advan. | Gp."C" Tech/Gen | Gp."D" Novice |
|---|---|---|---|---|
| Ø (*) | AAØNC | KGØGE | NØXCO | KBØLGZ |
| 1 (*) | AA1GS | KD1PE | N1PGU | KB1AXJ |
| 2 (*) | AA2NZ | KF2PE | N2VAX | KB2QGL |
| 3 (*) | AA3ER | KE3II | N3PEV | KB3AUP |
| 4 (*) | AD4ES | KQ4VO | (***) | KE4BWU |
| 5 (*) | AB5NQ | KJ5MN | (***) | KC5AWV |
| 6 (*) | AB6TV | KN6MM | (***) | KD6WHW |
| 7 (*) | AA7WF | KI7NO | (***) | KB7VBN |
| 8 (*) | AA8LI | KG8BM | N8YVY | KB8OZJ |
| 9 (*) | AA9HG | KF9PN | N9TRQ | KB9IQE |
| N.Mariana Is. | AHØS | AHØAN | KHØBZ | WHØAAX |
| Guam | NH2P | AH2CS | KH2GV | WH2ANG |
| Johnston Is. | AH3D | AH3AD | KH3AG | WH3AAG |
| Midway Is. | | AH4AA | KH4AG | WH4AAH |
| Hawaii | (**) | AH6MS | WH6MR | WH6CQN |
| Kure Is. | | | KH7AA | |
| Amer. Samoa | AH8G | AH8AF | KH8AL | WH8ABB |
| Wake W.Peale | AH9C | AH9AD | KH9AE | WH9AAI |
| Alaska | (**) | AL7OY | WL7KU | WL7CHB |
| Virgin Is. | NP2Y | KP2CC | NP2GM | WP2AHU |
| Puerto Rico | (**) | KP4VI | (***) | WP4MAP |

*CALL SIGN WATCH:* *=All 2-by-1 "W" prefixed call signs have been assigned in all radio districts. Group "A" 2-by-2 format call signs from the AA-AK block are next assigned to Extra Class amateurs when 2-by 1's are all allocated.

**=All Group A (2-by-1) format call signs have been assigned in Hawaii, Alaska and Puerto Rico. Group "B" (2-by-2) format call signs are assigned to Extra Class when Group "A" are depleted.

***=Group "C" (1-by-3) call signs have now run out in the 4th, 5th, 6th, 7th and Puerto Rico call districts. According to the rules (adopted by the Commission Feb. 8, 1978, Docket No. 21135), Technician/General class amateurs are next assigned Group "D" (2-by-3 format) call signs when all Group "C" have been assigned.

Upgrading Novices holding a 2-by-3 format call sign in the 4th, 5th, 6th, 7th and Puerto Rico call areas will no longer be able to request a Group "C" call and will be automatically assigned another more recent 2-by-3 format call sign if they do! The FCC will not be going back and reassigning unused "K" and "W" 1-by-3 format call signs.

*[Source: FCC, Gettysburg, Pennsylvania]*

## APRIL AMATEUR LICENSING STATISTICS

| April | 1990 | 1991 | 1992 | 1993 |
|---|---|---|---|---|
| New Amateurs: | | | | |
| New Novices | 2368 | 2651 | 1330 | 944 |
| New Tech's | 239 | 3025 | 3870 | 2296 |
| *Total New:* | *2658* | *5749* | *5215* | *3290* |
| *Upgrading:* | | | | |
| Novices | 1289 | 1621 | 889 | 472 |
| Technicians | 598 | *772 | *749 | *523 |
| Generals | 410 | 500 | 488 | 335 |
| Advanced | 249 | 346 | 315 | 240 |
| *Total:* | *2546* | *3239* | *2441* | *1570* |
| *Renewals:* | | | | |
| Total Renew: | 77 | 86 | 62 | 195 |
| Novices | 14 | 5 | 6 | 16 |
| *Purged:* | | | | |
| Total Dropped: | 12 | 16 | 7 | 18 |
| Novices | 0 | 2 | 0 | 1 |
| *Census:* | | | | |
| *Indiv. Oper.* | *457369* | *512918* | *561197* | *603717* |
| Change/Year | +4450 | +55549 | +48279 | +42520 |

*Individual Operators by Class:* *(and % of total)*

| Extra | Advan. | General | Technic. | Novice | Total: |
|---|---|---|---|---|---|
| *April 1990* | | | | | |
| 49169 | 99702 | 114406 | 112214 | 81878 | *457369* |
| 10.7% | 21.8% | 25.0% | 24.6% | 17.9% | 100.0% |
| *April 1991* | | | | | |
| 54887 | 106075 | 120800 | 134655 | 96501 | *512918* |
| 10.7% | 20.7% | 23.5% | 26.3% | 18.8% | 100.0% |
| *April 1992* | | | | | |
| 58913 | 108575 | 123543 | 171803 | 98363 | *561157* |
| 10.5% | 19.4% | 22.0% | 30.6% | 17.5% | 100.0% |
| *April 1993* | | | | | |
| 62669 | 110825 | 126168 | 203873 | 100182 | *603717* |
| 10.4% | 18.3% | 20.9% | 33.8% | 16.6% | 100.0% |

| Club/ RACES & Military: | (1990) | (1991) | (1992) | (1993) |
|---|---|---|---|---|
| | 2449 | 2432 | 2431 | 2431 |
| **Total Active:** | **459818** | **515350** | **563628** | **606148** |
| % Increase | +1.0% | +12.1% | +9.4% | +7.5% |

(* = Does not include Technicians upgrading to Tech Plus)

## NUMBER OF AMATEURS BY CALL SIGN GROUP:

| Group | Extra | Advan. | General | Technic. | Novice | Total |
|---|---|---|---|---|---|---|
| A | 35515 | 683 | 249 | 7 | 0 | 36454 |
| B | 4036 | 29040 | 54 | 6 | 1 | 33137 |
| C | 14405 | 44140 | 67565 | 90494 | 48 | 216652 |
| D | 8468 | 36845 | 58193 | 113305 | 100131 | 316942 |
| Other | 245 | 117 | 107 | 61 | 2 | 532 |
| Total | 62669 | 110825 | 126168 | 203873 | 100182 | 603717 |

[Group "A"=2X1 & 2X2; "B"=2X2; "C"=1X3 "D"=2X3 format.]

*[Source: FCC Licensing Facility, Gettysburg, PA]*

• The beginning of a new era in the commercial development of space and the retrieval of a European satellite highlight NASA's 7-day Shuttle Mission STS-57 scheduled for June 20th. The mission will feature Space Shuttle Endeavour and her six-person crew deploying experiments designed by and for students. This will be the fourth flight of Endeavour and the 56th flight of the Space Shuttle system.

The rendezvous with the European Space Agency's European Carrier (EURECA) satellite is scheduled to take place on the fourth day of the mission. The Shuttle's robot arm will be used to retrieve the satellite so it can be returned to Earth. The EURECA satellite has been on-orbit for a year collecting data.

STS-57's major payload will be the privately-developed SPACEHAB module which contains lockers and rack space which can be rented to other commercial customers on upcoming shuttle flights. One experiment flying inside the SPACEHAB includes the first soldering experiment in space by American astronauts.

There are three other payloads including a Get Away Special (GAS) photography experiment developed by the children and teachers of the Charleston (SC) County School District. A spacewalk (EVA) is also planned for STS-57 "day four" to refine procedures being developed to repair the Hubble Space Telescope on the flight of STS-61 in December.

There are two ham operators on board STS-57. *Brian Duffy,* 39, Col., USAF, *N5WQW,* and *Janice Voss* (Electrical Engineer, Ph.D from MIT), call sign not yet received, will operate SAREX. Both are from Massachusetts. Duffy operated SAREX before during STS-45. It is Voss' first space flight.

Operating times for school contacts are planned into the crew's activities. The school contacts generate interest in science as students talk directly with Voss or Duffy. There will be voice contacts with the general ham operator community as time permits and short wave listeners (SWLs) worldwide also may listen. When Voss or Duffy are not available for FM voice contacts, SAREX-II will be in an automated digital response (packet) mode.

The primary voice frequency that SAREX-II uses is 145.55 MHz downlink. There are a variety of uplink frequencies. Contacts with Endeavour will be possible between 42 degrees north latitude to 42 degrees south latitude, covering the lower half of the continental United States and Hawaii, all of Africa, most of South America, Australia, the East and the Far East.

As always, the amateur radio station at the Goddard Space Flight Center, WA3NAN, in Greenbelt, MD., will operate around-the-clock during the mission, providing information and retransmitting live Shuttle air-to-ground audio.

| | Shuttle Transmit Frequency | Shuttle Receive Freq. |
|---|---|---|
| United States | 145.55 (MHz) | 144.99 |
| South America | 145.55 | 144.97 |
| & Asia | 145.55 | 144.95 |
| | 145.55 | 144.93 |
| | 145.55 | 144.91 |
| Europe | 145.55 | 144.70 |
| | 145.55 | 144.75 |
| | 145.55 | 144.80 |
| South Africa | 145.55 | 144.95 |
| Packet | 145.55 | 144.49 |

WA3NAN planned HF operating frequencies: 3.860, 7.185, 14.295, 21.395 and 28.395 Mhz

The Shuttle Amateur Radio Experiment-II (SAREX-II) provides for public participation in the space program, supports educational initiatives and demonstrates the effectiveness of making contact between the Space Shuttle and low-cost amateur "ham" radio stations on the ground.

*William S. McArthur, Jr., KC5ACR* aboard STS-58 (scheduled for September) will be the next SAREX mission. Both Janice Voss and Bill McArthur took their ham exams at W5YI coordinated test sessions at the Johnston Space Flight Center, Houston.

• *The Academy of Model Aeronautics is ticked off* at the FCC and their plan to allocate 200 narrowband low-power land mobile channels in the 72-76 MHz band. The Academy represents the nation's one-million radio-controlled model craft users. As proposed, the new mobile-use channels will be only 2.5 kHz removed from R/C channels located at 72 and 75 MHz instead of the customary 10 kHz.

The proposed new low power mobile channels can be used for Public Safety, commercial and non-commercial use. The Academy believes these channels are likely to be used near urban flying sites and public recreational areas.

A test recently conducted and documented by the Academy demonstrates that unless a 10 kHz separation is maintained, remotely controlled models on R/C frequencies will suffer substantial interference, incur in-flight loss of control of model aircraft with an accompanying severe threat to public safety. *(Comments filed May 28, 1993)*

• Here is something else for the Academy to worry about! *New sports radio frequencies have been proposed.*

Inner Ear Communications Inc. has asked the FCC to permit 30 channels in the 72.44-75.60 MHz band to be used for broadcasting of custom, on-site sports reports to pocket receivers rented to spectators.

The company has been testing the service -- named "One On One" -- under an Experimental Radio Service license at sports events such as the Ameritech Seniors Open, MCI Heritage Classic, Doral Open, Vantage Championship and Churchill Downs. Staffing for a typical golf tournament would include six on-course reporters, stationed at various locations around the course, and one or more anchors at a base station.

The transmitter delivers one watt FM in 20 kHz of occupied bandwidth. As it is not encrypted, the signal could be easy and legal to receive on ordinary scanning equipment in addition to the rental radios. The operator must coordinate frequencies in advance to avoid interference with other users, such as land mobile radio, TV channels 4 and 5 or the FAA's 75.0 MHz Instrument Landing System which guides pilots to airports. Receivers contain a timeout circuit to discourage customers from taking the units with them after the event.

The company pointed out that past efforts by others to provide audio services at sporting events failed due to expense and difficulty of installing hard-wire antenna equipment. Those attempts used loop or strip antennas

near seating areas. Inner Ear's system is mobile and uses ordinary base station antennas. The company has applied for patents for the system and has requested a Pioneer's Preference from the FCC. If granted, the Preference could assure Inner Ear special advantages over competitors for the spectrum.

• Kenwood says "Scanner ban needs repair work!" The first phase of the FCC's ban on cellular-capable scanning receivers is now in effect, and it already appears to be creating problems for the industry.

Kenwood Communications Corp. has asked the FCC to reconsider several points of the ban. As required by new Federal law, the FCC laboratory will no longer certify (allow into the market) new models of scanners that can receive 800 MHz frequencies allocated to the Domestic Public Cellular Radio Telecommunications Service or that can be "readily altered" by the user to do so.

The actual cutoff date was April 26, 1993 -- just four days after the FCC released its decision in the matter. Some manufacturers apparently had products under development when the decision hit. "Products in the development cycle should have been permitted to be accepted, at least for 60 to 90 days after the effective date of the new rule, so that manufacturers such as Kenwood which have invested substantial sums in the development of a new product, will not have wasted same under the circumstances," Kenwood said.

Effective April 26, 1994, manufacture and importation of all cellular-capable scanners -- those that had already received approval -- will be forbidden. The ban also applies to 800 MHz frequency converters.

A few nationwide scanner dealers now include "get 'em while you still can" messages in their advertising and promotional mailings. Some amateur media erroneously reported that sale is outlawed. In fact, sale of existing scanners and converters that had FCC approval will be allowed indefinitely unless the units were modified to receive cellular.

Kenwood is concerned about the fate of its business of modifying transceivers for licensed Military Affiliate Radio System (MARS) and Civil Air Patrol (CAP) users. "Under current circuit configurations, such modifications (which cannot be performed by most individuals due to the nature of the microcircuitry involved and the complexity of the modifications necessary) would, incidentally, expand the receiver capability of these transceivers up to and including the 800 MHz band," the company told the FCC.

Kenwood wants the FCC to make clear that such modifications for licensed users won't violate the rules. The company also wants the FCC to allow products in the development stage to be authorized for manufacture and marketing and that a "reasonable time, on the order of two years," be permitted for products that have already been approved to be redesigned or replaced.

Kenwood, like other commenters, was not happy with the FCC's definition of "readily being altered by the user". The FCC said that the scanner must be designed so that adding or clipping leads or components, or plugging in or reprogramming chips will not enable it to receive cellular frequencies.

"It is impossible, based on those anecdotal examples, for Kenwood to determine which of its products may require modification, and if so, in what respects, in order to comply with the proposed rule," the company said. "What other configurations constitute 'readily alterable'?

The timetable for modification of products, and for having a product to sell at all, is dependent, among other things, on the interpretation of the definition of 'readily alterable' adopted in the Report and Order in this proceeding, which is far too vague a definition to be complied with by any manufacturer, short of implementing actual frequency blocking in the microprocessor chip, which the Commission specifically did not require."

• THE WHITE HOUSE, Office of Presidential Correspondence circulated an interesting message to the nation's e-mail users last week: "LETTER FROM THE PRESIDENT AND VICE PRESIDENT IN ANNOUNCEMENT OF WHITE HOUSE ELECTRONIC MAIL ACCESS. Dear Friends: Part of our commitment to change is to keep the White House in step with today's changing technology. As we move ahead into the twenty-first century, we must have a government that can show the way and lead by example. Today, we are pleased to announce that for the first time in history, the White House will be connected to you via electronic mail. Electronic mail will bring the Presidency and this Administration closer and make it more accessible to the people.

The White House will be connected to the Internet as well as several on-line commercial vendors, thus making us more accessible and more in touch with people across this country. We will not be alone in this venture. Congress is also getting involved, and an exciting announcement regarding electronic mail is expected to come from the House of Representatives.

Various government agencies also will be taking part in the near future. Americans Communicating Electronically is a project developed by several government agencies to coordinate and improve access to the nation's educational and information assets and resources. This will be done through interactive communications such as electronic mail, and brought to people who do not have ready access to a computer."

The letter asks that the public be patient as government is "reinvented" and placed "on the leading edge of progress." All letters will be immediately read and acknowledged and a careful count taken on the number received and subject of each message. The White House should be capable of sending back a tailored response by the end of the year.

The government will also be testing a number of "response-based programs" that read and effectively answer correspondence. "Since this has never been tried before, it is important to allow for some flexibility in the system in these first stages. We welcome your suggestions."
(Signed) President Clinton
President@WHITEHOUSE.GOV,
(Internet E-mail address)
Vice President Gore:
Vice.President@WHITEHOUSE.GOV

## QST HAS NEW "MANGLING" EDITOR

"QST" the official journal of the American Radio Relay League has a new Managing Editor!. He is ***K3KMO, Albert M. Brogdon,*** 57. The Callbook shows his mailing address as Box 60 in Damascus, Maryland. We tried to reach him by telephone but apparently he lives elsewhere, however, since he has no phone number listed in that area for him. Our understanding is that he has a background in military and/or technical writing or publishing - which we were unable to confirm. He holds an Amateur Extra Class ticket.

The opening for Managing Editor was listed in a recent *League Lines* in QST and we assume that's how Al got wind of the opening. ***Dave Sumner, K1ZZ*** remains in charge as Publisher - actually a strange title since he does not fund the publication as all publishers do.

***Mark Wilson, AA1Z,*** who used to be QST Managing Editor, was promoted to Publications Manager some time back when ***Paul Rinaldo, W4RI*** shifted to Washington, DC. Since the Publications Manager is also the Editor of QST, and this left Mark handling both the Editor and Managing Editor jobs.

The logical choice for Managing Editor was ***Kirk Kleinschmidt, NTØZ,*** who as Assistant Managing Editor should have been the top candidate. But for whatever reason, he did not get it. We don't know when Al Brogdon starts, but he will be in charge of handling the nuts and bolts of putting QST together.

## BIOLOGICAL HAZARDS OF RF RADIATION

The FCC has proposed updating the guidelines it uses for evaluating environmental radiofrequency (RF) radiation from FCC-regulated transmitters. Electromagnetic radiation consists of waves of electric and magnetic energy moving together through space at the speed of light.

The RF portion of the electromagnetic spectrum is generally considered to range from 3 kHz to 300 GHz. As a general rule, the higher the frequency, the greater the energy content and potential for damage through heating of biological tissue.

There is disagreement over exactly what levels of RF radiation are "safe," particularly with regard to low levels of exposure. According to the National Environmental Policy Act of 1969, the FCC must take environmental effects into consideration when performing its rule making function.

Unlike the EPA, FDA, NIOSH or OSHA *[Environmental Protection Agency, Food and Drug Administration, National Institute for Occupational Safety and Health or the Occupational Safety and Health Administration]*, the FCC is not a health and safety agency. It is thus not expert at evaluating biological effects and potential hazards of radiofrequency radiation.

The FCC is now proposing to use the radiation standards adopted last year by the *American National Standards Institute* (ANSI) and the *Institute of Electrical and Electronic Engineers, Inc.* (IEEE). The new 1992 ANSI/IEEE standards are more restrictive than the 1982 ANSI standards they replace.

Your author is one of the three members of the VEC's Question Pool Committee and some of our questions specifically address "...exposure of the human body to RF." On that basis, I decided to write the FCC's Office of Engineering and Technology to obtain information about how the new standards will affect Amateur Radio.

We have now received a letter and package of data from Dr. Robert F. Cleveland, a physical scientist at OET. The information (about 200 pages) also included a preliminary draft copy of a not-yet-released joint FCC/EPA measurement study of amateur radio installations.

### *Standards*

The RF safety guidelines (ANSI/IEEE C95.1-1982) were replaced last year by the IEEE. They now carry the standards number: ANSI/IEEE C95.1-1992. The RF standards "Committee on Man and Radiation" is chaired by Dr. John Osephchuk of the Raytheon Corporation in Massachusetts.

We discussed the new IEEE radiation standards with both Dr. Cleveland and Dr. Osephcuk on the telephone ...and also Luigi Napoli, of the IEEE's standards development department in New Jersey. Dr. Cleveland, by the way, said he would be willing to review and assist the Question Pool Committee with any questions in the Amateur question pools about biological effects and potential hazards of radiofrequency radiation.

The 1982 safety recommendations were meant to alert everyone of the possible harmful effects in human beings of RF fields between 300 kHz and 100 GHz. They make wide use of a term called specific absorption rate, or SAR. This basically is the time frame in which RF is absorbed into the human body. While complex formulas apply, the guidelines generally say that low power transmitters with seven watt or less RF input power were safe.

The 1982 standards recommend frequency-dependent exposure limits since studies showed that the human body absorbs RF energy at some frequencies better than at others. The most restrictive limits were in 30-300 MHz VHF frequency range.

The even more stringent 1992 standards are based on recent data on biological effects and look at RF exposure in different surroundings - under both controlled and uncontrolled conditions.

A controlled environment is defined as "...being under the control of an aware user." Again, complex formulas involving frequency, field strength, power density, body weight and exposure time apply when determining safe levels for both controlled and uncontrolled environments. There are also new restrictions on RF fields induced in the human body by radio frequencies below 100 MHz.

In certain situations, however, there are exclusions from the formula. For example, in a controlled environment, low power transmitters radiating 7 watts or less are deemed safe at 450 MHz and below when the antenna is more than 2.5-cm from the body. [And a hand-held "rubber duck antenna" is frequently closer.] The safe level gets reduced as the frequency goes higher. For example, 2.5 watts is the maximum safe level for low power devices at 1240 MHz in a controlled environment.

The RF exposure guidelines are much stricter in uncontrolled environments. Transmitter users are considered to be in a controlled environment, while other persons in the immediate vicinity are deemed to be in an uncontrolled environment. The safe level of a low power device operating at frequencies up to 450 MHz in an uncontrolled environment is a maximum of 1.4 watts. This level is much less when the frequency is above 450 MHz ...about a half a watt at 1240 MHz.

Field strengths drop off sharply as the distance from the radiator increases. A 2-meter or 220-MHz installation running 500 watts ERP would meet the ANSI/IEEE limits for field intensity if the antenna was 11 meters (about 34 feet) above ground level.

***Amateur radio study***

In 1990, the *Environmental Protection Agency* and the FCC conducted a joint study of several amateur radio installations in Southern California. The objective was to obtain information on the potential impact of RF fields on ham operators and others who might be present in the immediate vicinity of the station "...where it is reasonable to assume that persons who might not have control or knowledge of their exposure could have access."

Nine amateur stations were selected which had a variety of antennas and transmitting equipment capable of operating on different frequencies. The Southern California location was chosen because of its relative closeness to the EPA laboratory in Las Vegas, Nevada, where the EPA personnel, measurement vehicle and most of the measuring equipment was located.

Stations ranged from simple to complex. Antennas used included Yagis, Quagis, inverted-Vs, horizontal dipoles, verticals, VHF-discones ...and others. Primarily, HF and VHF frequencies were used for transmissions with operating power levels ranging from 100 watts or less to as much as 1400 watts.

"Key down" (100% duty cycle) measurements were made at one or two meters above ground at different distances from the antennas. Measurements were also made at various locations inside buildings and inside the "ham shack" at the operating position. An attempt was made to use high power levels in order to create "worst case" scenarios.

The results of the test showed that while some field strengths at HF frequencies can be relatively high, the potential hazard may be less than for lower field strengths measured at VHF frequencies where the highest specific absorption rates (SARs) occur in human beings. Ground level field strength readings at HF frequencies were actually low. You had to get into the main "beam" path to obtain significant radiation levels.

It appears that vehicle-mounted amateur antennas which are closer to the ground create the greatest possibility for significant exposure in publicly accessible areas. There were several cases where the peak levels of RF exposure exceeded limits recommended for "uncontrolled" environments. It was also found that dipole antennas which are often strung just above a roof or yard presented high field strength readings. Generally, RF field strengths encountered inside "ham shacks" were well below IEEE recommended exposure limits.

The study concluded that "Precautionary measures should be sufficient to prevent exposure of the amateur operator and other persons to RF levels in excess of protection guidelines. Examples of such measures would be:

- using the minimum power necessary for a transmissions;
- minimizing transmission time so that time-average exposures are acceptable;
- determining where high-field areas exist and restrict access to them during transmissions and;
- mounting antennas as high above ground as practical."

The comment date on the FCC's proposal entitled "*Guidelines for Evaluating the Environmental Effects of Radiofrequency Radiation*" does not close until August 13th. They would be interested in hearing your views on the matter.