

W5YI

Nation's Oldest Ham Radio Newsletter

REPORT

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Automatic Control of HF Digital Communications Proposed

On June 23rd, the FCC released the text of a *Notice of Proposed Rulemaking* which looks toward authorizing automatic control of stations transmitting digital signals on the High Frequency (HF) amateur service bands. Section §97.3(a) of the Rules defines automatic control as the use of devices and procedures for control of a station without the control operator being present at a control point. Only stations specifically designated in the rules may be automatically controlled.

The proceeding was initiated by two petitions for rule making. RM-8218 was filed by the American Radio Relay League (ARRL); RM-8280 by the American Digital Radio Society (ADRS).

Background

The propagation characteristics of the HF bands allow for long distance communications. Of the nine frequency segments allocated to the amateur service in the HF (3-30 MHz) portion of the radio spectrum, data and RTTY digital emissions may be transmitted on all but the 75 meter 3.75-4.00 MHz. phone band. Amateur operators take advantage of these characteristics to communicate with other amateur stations, particularly with those in other countries.

Establishing and maintaining a HF communications link, however, presents operating demands not encountered on the Very-High Frequency (VHF) and higher frequencies above 30 MHz. The variables affecting communications in

the HF bands are highly complex. To maintain communications and avoid causing interference to the communications of other amateur stations, the control operator constantly monitors the activity on the channel being used and adjusts the station's transmitting parameters as needed.

Because the presence of the control operator has been imperative for proper operation in such systems, automatic control of an amateur station that is transmitting on an HF band has not been authorized.

The rules applicable to amateur service message forwarding systems were revised effective June 1, 1994. These revisions, however, did not authorize automatic control of stations transmitting on the HF bands. The FCC seeks to do this now.

In 1986, automatic control of amateur stations transmitting digital communications on the VHF and higher frequency bands was authorized. This allowed amateur operators to utilize high-speed computer-based message technology for the rapid and accurate relaying of messages and data.

In the same proceeding, the FCC indicated an interest in also authorizing automatic control of amateur stations transmitting digital communications in the HF band. In this regard, the Commission noted that a feasibility study planned by the American Radio Relay League would be helpful in determining if any rule changes were necessary to

prevent interference to and from other amateur service communication. The ARRL's petition is the result of that study.

Discussion

The ARRL project was carried out under *Special Temporary Authority* granted by the FCC to some fifty amateur stations. These stations were assembled as an automated digital communication system on the 20 meter HF band based upon the AX.25 packet radio protocol used generally by amateur stations on the VHF bands.

Through the experience gained managing this system, the ARRL concluded that the only regulatory safeguard needed to prevent interference to other stations is to restrict those stations that engage in automatically controlled station transmissions to specific subbands within the eight HF bands where data and RTTY emission types may be transmitted.

The League believes that this approach will provide advance notice to other amateur operators that they may receive interference to their communications from automatically controlled stations should they attempt to operate their stations in these subbands. They recommended that the subbands be those it has coordinated with other amateur radio societies in North and South America.

In its petition, the American Digital Radio Society states that it also believes that automatic control in the HF bands is workable as long as proper safeguards for other users of these bands are included. ADRS members are amateur radio operators interested primarily in developing digital communications technology. It agrees that communications between automatically controlled stations should be confined to the ARRL-recommended subbands.

The ADRS also recommended, however, that communications between a locally or remotely controlled station and an automatically controlled station should be permitted on any frequency authorized for data and RTTY emission types. It argues that the potential for interference is much less from stations operating in this configuration because the control operator of the locally or remotely controlled station can terminate the transmissions from all the stations. The ARRL supported this ADRS position.

The FCC said they were "...gratified by the cooperation and dedication of organizations within the amateur service community in determining the conditions necessary to allow automatic control of stations transmitting data and RTTY emission types on the HF amateur service bands."

They concurred that automatic control of amateur stations in the HF bands can, with the safeguards

recommended, make the transmission of data and RTTY emission types practical and effective. The FCC also noted other examples of designated subbands to minimize interference include subbands for repeater stations and a weak-signal subband recently established at 220.00-222.15 MHz. "...we believe that the potential for interference to the communications of other amateur stations will be mitigated by rules based upon their recommendations."

The FCC proposal

The Commission said they are proposing to change the rules to authorize automatic control for stations transmitting data and RTTY emission types on the HF subbands suggested by the ARRL. They also proposed to authorize communications between a locally or remotely controlled station and an automatically controlled station on any frequency where data and RTTY emission types are otherwise authorized. (Amateur stations are authorized to transmit a RTTY or data emission between 3.50-3.75, 7.00-7.10, 10.10-10.15, 14.00-14.15, 18.068-18.110, 21.0-21.2, 24.8-24.93 and 28.0-28.3 MHz. These HF band segments are separate from the subbands where analog emission types are authorized.

"These proposed rules are intended to facilitate the development of digital communications on the HF amateur service bands," the FCC said. "We firmly believe in the principle that government should be responsive to user needs." In the NPRM, the Commission mentioned last year's Report of the National Performance Review, *From Red Tape to Results: Creating a Government That Works Better and Costs Less*, by Vice President Al Gore.

The Vice President's Report stresses putting people first. Serving customers and cutting costs are two of its key principles. "This Notice embraces these principles by seeking ways to allow amateur service licenses to use efficient technologies that are now available so that they can operate their stations in the manner they desire."

"The rules that we are proposing are the result of a successful feasibility project planned and carried out within the amateur service community. They are responsive to the recommendations of two organizations dedicated to bringing the benefits to be derived from the transmission of digital communications on the amateur service HF bands to amateur operators in the United States and elsewhere without causing unnecessary interference to other types of communications. We request comments on these proposals. Interested parties may file comments on or before October 1, 1994, and reply comments on or before November 1, 1994."

Proposed rule changes

Part 97 of Chapter I of Title 47 of the Code of Federal Regulations, Section 97.109 is proposed to be amended by revising paragraphs (d) and (e) to read as follows:

§97.109 Station control.

(d) When a station is being automatically controlled, the control operator need not be at the control point. Only stations specifically designated elsewhere in this Part may be automatically controlled. Automatic control must cease upon notification by an EIC that the station is transmitting improperly or causing harmful interference to other stations. Automatic control must not be resumed without prior approval of the EIC.

(e) No station may be automatically controlled while transmitting third party communications, except a station transmitting a RTTY or data emission. All messages that are retransmitted must originate at a station that is being locally or remotely controlled.

New Section 97.221 to read as follows:

§ 97.221 Automatically controlled digital station.

(a) This rule section does not apply to an auxiliary station, a beacon station, a repeater station, an earth station, a space station, or space telecommand station.

(b) A station may be automatically controlled while transmitting RTTY or data emissions on the 6 m or shorter wavelength bands, and on the 28.120-28.189 MHz, 24.925-24.930 MHz, 21.090-21.100 MHz, 18.105-18.110 MHz, 14.0950-14.0995 MHz, 14.1005-14.112 MHz, 10.140-10.150 MHz, 7.100-7.105 MHz, or 3.620-3.635 MHz segments.

(c) A station may be automatically controlled while transmitting a RTTY or data emission on any other frequency authorized for such emission types provided that:

(1) The station is responding to interrogation by a station under local or remote control: and

(2) No transmission from the automatically controlled station occupies a bandwidth of more than 500 Hz.

HAM OPERATOR APPOINTED FCC LEGAL ADVISOR

On June 29th, FCC Commissioner Susan Ness appointed David R. Siddall as legal advisor. Ness, a Democrat, was sworn in June 3rd by Supreme Court Justice Ruth Bader Ginsburg. Her term ends in 1999.

Attorney Dave Siddall will concentrate on mass media and wireless matters. His background includes working on communications law at the Library of Congress and emerging technology issues in the FCC's Common Carrier and Mass Media Bureaus. For the

last couple of years, Siddall has served as Chief of the Frequency Allocation Branch which is responsible for authorizing spectrum to emerging wireless services.

Dave, who is also Amateur Extra Class. K3ZJ, resides with his wife Mary and sons James and Michael in Great Falls, VA. (From FCC Press Releases)

FCC IS REORGANIZING, OR DOING MORE WITH LESS

Al Gore's call for the government to reinvent itself is leading to a reorganization of the Federal Communications Commission. No one is quite sure where it will lead to, but the FCC's Private Radio Bureau will be involved. Licensing procedures are also under scrutiny.

Rumors persist that there will be a new Wireless Services Bureau. (Reportedly, it will be headed by Ralph Haller, currently Chief of the Private Radio Bureau and chairman of the Commission's *Personal Communications Services Task Force*.) We also heard talk about a new International Bureau to coordinate global telecommunications issues.

The realignment is being handled by Mary Beth Richards, a special assistant to FCC Chairman Reed Hundt. Apparently the needs of industry will play an important role in the reorganization since she reportedly has called in several industry representatives for their input. Richards previously headed the Enforcement Division in the Field Operations Bureau.

Whatever form the FCC reorganization takes, they will have to do it with less than anticipated revenues. The FCC had hoped to get a \$188.4 million budget for fiscal year 1995, but it was not in the cards. The House Appropriations Committee approved only \$168.8 million, nearly \$20 million less. Most of the requested increase was to be used to fund 251 new staff members needed by FCC to handle greatly increased responsibilities caused by telecommunications reform measures now in the process of being adopted by Congress.

The Committee also approved a \$21 million increase in "user fees" to be paid by industries regulated by the FCC. That means user fees will now total some \$116.4 million ...still \$72 million short of the Clinton administration's proposal for a FY-1995 self-funded FCC. A self-supporting FCC is still a couple of years away. The White House also killed its controversial *Spectrum Tax* that was to have paging, cellular and broadcasting licensees fund \$4.8 billion to solve non-telecommunications related problems.

It probably is only a matter of time before ham operators will be asked to pay their fair "regulatory fee" share. The new Gettysburg amateur service data processing system has been programmed to accept fees. We saw the provision for an amateur radio user fee on the new PC input screen ourselves a couple of weeks ago when we attended the VEC Conference.

SCANNER DISTRIBUTOR RECEIVES \$20,000 CITATION *FCC says their receivers contained cellular frequencies*

The FCC has imposed a whopping \$20,000 fine against Ace Communications of Fishers, Indiana, for promoting and marketing Yupiteru and Trident scanners that have not been certified for sale by the FCC. "Scanners" are radio receivers that can automatically switch between four or more frequencies anywhere in the 30-960 MHz band.

The Commission said that Ace Communications advertised its "530 kHz to 1650 MHz" scanners in ham (73 and CQ) and SWL (Popular Communications) magazines last Fall and continued to sell them to companies and individuals this Spring after being warned not to do so.

The base fine for marketing unauthorized equipment is normally \$7,000. The amount of the fine was adjusted upward, however, because the violations were repeated and intentional. The FCC said Ace continued to market its scanners after receiving a September 23, 1993, FCC letter warning them that scanning receivers can not be marketed without first obtaining an FCC equipment authorization. A follow up letter on December 8, 1993, from the Commission cautioned Ace Communications that the "...FCC no longer grants equipment authorizations to scanner receivers that tune into the cellular telephone frequencies and marketing of such devices without an FCC authorization is prohibited."

Both the Trident and the Yupiteru scanning receivers include cellular telephone receiving capability. The Commission said the violations were premeditated since its Trident Model 2400 scanner contained a misleading label with the unvalidated "FCC Identifier" number, G70TR2400.

Ace Communications was ordered to pay the \$20,000 fine by July 30, 1994, or to show cause why the forfeiture should be reduced or not imposed. (Action by FCC Enforcement Division, Field Operations Bureau; June 22, 1994.)

FCC SHUTS DOWN EMERGENCY BEACON

The Coast Guard was hearing a distress call from a vessel in the Solomon's Island area of Maryland, but could not find the vessel. At the Coast Guard's request, Baltimore FCC engineers drove to the area and were able to pick up the distress signal. The direction-finding vehicle gave the general location of the signal source to a Solomon's Island marina. Using a hand-held direction-finder, the engineer found the vessel giving the distress signal. There was no distress. In fact, the vessel was docked. An emergency beacon on board the vessel falsely triggered and broadcast the distress signal.

VESSEL TRAFFIC JAMMED IN SEATTLE

The Vessel Traffic System (VTS) is operated by the U.S. Coast Guard in Seattle to safely control commercial shipping in the Puget Sound. On June 30th, the Coast Guard requested FCC assistance to help locate a signal that was interfering with the supervision and control of the VTS operating between Tacoma and the Canadian border. FCC engineers, using direction-finding equipment, responded and identified the source of interference as the fishing trawler, Alaska Ocean. The ship's crew had accidentally left the transmitter on. The FCC informed the captain and he quickly shut the transmitter down and eliminated the interference.

ASSISTANCE TO U.S. NAVY

The San Francisco Office received a call from the Alameda Naval Air Station complaining of interference to their fire emergency channel. FCC investigators tracked the interference source to an amateur radio repeater station in Hayward, California. The transmitter produced an unwanted signal that drifted through several government radio communications bands. This same signal also interfered with nearby FM communications. The amateurs shut down the station to eliminate the interference.

HAWAIIAN FIELD TRIP

The Honolulu Office responded to a collection of complaints from the remote villages of Honokaa and Kamuela last week. The complaints primarily centered around the interference caused to electronic home entertainment equipment by local CB radio operators. A random inspection of vehicles with CB antennas in Kamuela produced two illegal radio frequency power amplifiers and several non-type accepted transmitters. CB operators in Honokaa, hearing of the investigation, removed all CB radio equipment in the village bringing a temporary resolution to the interference problem.

CELLULAR TELEPHONES AND EMI

A California congressman has asked the General Accounting Office (GAO) to study electromagnetic interference (EMI) caused by radio waves ...especially those from cellular telephones. Representative Gary Condit says at least five deaths have been reported and dozens of cases exist where cellular phones have caused medical devices to fail or malfunction. Radio waves have reportedly caused breathing monitor failure ...no alarm sounds when the user stops breathing. Some hospitals are even banning cellular phone operation inside their building. Motorized wheelchair manufacturers are being ordered to design EMI proof products. The FDA mandates that all respirators and pacemakers meet EMI compatibility standards.

FCC RECEIVES POINTED REPLY COMMENTS IN 2.4 GHZ REALLOCATION PROCEEDING

"Most [comments filed], in fact, completely ignore the impact on amateur radio if these frequencies are withdrawn from amateur use, or if amateur operators are forced to operate in close physical proximity to users incompatible with the amateur and amateur-satellite services." - AMSAT

"The high power and intermittent nature of amateur operations in the 2390-2400 MHz band preclude the feasibility of the sharing of that spectrum by a wireless local loop system and amateur operators, particularly in high population density areas. SBC continues to urge the Commission to allocate the 2390-2400 MHz band exclusively for the use of wireless local loop service." - *Southwestern Bell Corp.*

The federal government is hearing a cacophony of voices from commenters in ET Docket 94-32, which inquires into reallocating shared government spectrum to new uses, as required by new federal law. Of the spectrum proposed for reallocation, 35 MHz (2300-2310, 2390-2400 and 2402-2417 MHz) comes from the 13-cm band shared with the ham radio community.

Manufacturers of Part 15 unlicensed devices find the proposed reallocation unsatisfactory because they are concerned over sharing the band with high-power operations - commercial services that would most likely obtain their licenses at auction, forking over millions or billions of dollars to the federal treasury for the rights to operate in auctioned bands. Other commenters believe the bands may have utility in public safety applications. And of course, Amateur Radio organizations are letting the FCC and Department of Commerce know how the reallocation would affect their operations. *W5YI Report* has extensively covered their submissions.

The reply comments filed with the FCC said much the same thing, but two reply comments caught our eyes in particular: the filings from AMSAT, which wants amateur interests preserved, and Southwestern Bell Corporation, which wants spectrum for telephone service. Telephone companies have long sought spectrum for "wireless local loops," to connect to telephone customers without the need to actually send technicians to wire difficult-to-reach locations, or hazardous inner-city areas.

AMSAT, the *Radio Amateur Satellite Corp.* in Washington, D.C. responded to commenters in detail, guaranteeing that the FCC won't have an easy time dismissing amateur satellite concerns. We were a bit surprised to see AMSAT poke even other amateur commenters, suggesting that "terrestrial" amateur users are not informed as to the needs of amateur space

operations. Here are excerpts from the AMSAT filing:

"Even most of the other amateur groups who submitted comments, with the exception of the American Radio Relay League, do not seem to have much of an idea how the 2.4 GHz band might be used in the immediate future by the amateur-satellite service, much less 10 to 20 years from now. If history is any guide, some of these commenters who display little or no knowledge of the technologies which they are addressing, will become big and enthusiastic users of them."

"For example, fifteen years ago, virtually no amateurs were familiar with packet radio. Now, the amateur community has made noteworthy contributions toward developing this technology and it is currently in use by a sizable fraction of the amateur community. We feel certain that some of the new applications that are even now under development by the amateur-satellite community, will have a similar impact. But, that cannot happen if the amateur services do not have sufficient access to appropriate frequencies. These amateur commenters, again with the exception of ARRL, evidently represent certain terrestrial users which are not significantly involved in the amateur-satellite service; they also never contacted us for information."

"The American Association of State Highway and Transportation Officials Special Committee on Communications claims in their comments, that the 2400-2402 MHz segment is sufficient for existing amateur-satellite operations. We strongly disagree with this conclusion. They have never contacted us to inquire as to our current or future needs. Here again, we are faced with being judged on our "current" needs while other, "blue sky" services are apparently asking to be judged on yet uninvented means of communication."

"AT&T urges retaining 2400-2483.5 MHz for spread-spectrum Part 15 devices, especially for wireless LAN applications. They said that sharing with the amateur services would be acceptable but that they would want to prohibit any new users in the 2402-2417 MHz band. This would indicate that they, like so many others offering comments in this proceeding, look on amateur use of this band in terms of its present level of occupancy, rather than the growth that is certain to occur in the future. At the current rate of growth, the amateur population is expected to double in the next ten years. In addition, also as addressed in our Comments, the use of this band by the amateur and amateur-satellite services is virtually certain to grow at far higher rates."

"If the amateur services are forced to share these valuable frequencies with nearby high-density users, such as the kind of Part 15 spread-spectrum devices which AT&T is discussing, the noise-power

density may significantly degrade amateur and amateur-satellite communications, especially in weak-signal applications such as amateur-satellite downlinks, except perhaps in sparsely-populated areas, where few amateurs reside."

"Also of great concern to us is the potential for such Part 15 users to experience interference from licensed amateur stations. Although Part 15 devices are required by current FCC regulations to accept such interference, we are very concerned that, in practice, amateurs may be pressured by users of such devices to suspend or cease operations. In addition, interference complaints to the Commission by users of such devices may cause an administrative and budgetary burden, regardless of the merits of such claims."

"The *Association of Public-Safety Communications Officials International* claims that 2390-2400 MHz and 2402-2417 MHz would be particularly suitable for the advanced private mobile communications technologies ...including transmission of broad-band, high-resolution images and for private operational fixed service microwave operation at remote, high-elevation sites. Certainly such statements could be made about any band of frequencies in the microwave region of the spectrum. Just because frequencies would be 'particularly suitable' for a contemplated application does not necessarily mean that these frequencies should be re-allocated from their current use to that application or that such frequencies can be shared with the present users."

Reply Comments: Southwestern Bell Corporation (SBC)

"In the Notice of Inquiry, the Commission sought information on potential applications for 50 megahertz of spectrum that is proposed to be transferred immediately from the Federal Government to the private sector. Most of the 68 commenting parties in this docket provided little assistance to the Commission in its selection of appropriate allocations of the subject spectrum. Many of the parties complained that the proposed spectrum would actually be of little value in meeting various needs for spectrum."

"In contrast, SBC offered a specific proposal for one of the bands, the 2390-2400 MHz band. SBC suggested that the Commission's goals would be furthered by allocating the 2390-2400 MHz band for use by local exchange carriers in providing wireless local loop service for their customers."

"SBC further recommended that the Commission delay the licensing of that band until it can be paired with the 2300-2310 MHz band, permitting more efficient use of both bands. SBC submits that of the suggestions provided for use of the 2390-2400 MHz band, SBC's proposal not only is the most concrete and feasible but also is by far the most potentially benefi-

cial to the greatest number of customers."

"Wireless technology has evolved so that wireless local loop service is competitive both in price and in level of service compared with both copper wire and digital local carrier technology. The wireless local loop would replace the drop wire to the residence or small business, as well as a portion of the telephone distribution plant, with a low power microcellular radio system. The use of wireless local loop technology would permit easier and cheaper rehabilitation of aging local exchange plant, since digging through established yards and streets would not be necessary in order to place new facilities."

"The use of wireless local loop technology would benefit all telephone customers by reducing the cost of the telephone infrastructure while providing the capability to offer new services. Wireless local loop technology can reduce installation and maintenance costs, provide bandwidth on demand, and reduce the cost of providing additional telephone access lines to a customer. Before effective deployment of the technology can occur, however, spectrum must be allocated specifically for use with this technology."

"Various parties representing amateur radio groups suggested that amateur radio remain at least a secondary use, if not a co-primary use, of the 2390-2400 MHz band. The allocation of 10 MHz at the 2390-2400 MHz band to wireless local loop service is an important, appropriate, and beneficial use of the spectrum that the Commission is considering for reallocation. SBC agrees with the suggestion of these parties that the Commission should continue to make available other suitable spectrum for amateur use."

"As SBC stated in its comments, however, the high power and intermittent nature of amateur operations in the 2390-2400 MHz band preclude the feasibility of the sharing of that spectrum by a wireless local loop system and amateur operators, particularly in high population density areas. SBC continues to urge the Commission to allocate the 2390-2400 MHz band exclusively for the use of wireless local loop service."

"The amateur radio parties indicated that the 2300-2310 MHz and 2390-2400 MHz bands are largely reserved for future expansion of amateur services. However, there is significant use of the 2304 MHz frequency for weak signal work. If the Commission finds that this incumbent usage should be protected and that buffers should be provided, then SBC suggests that 4 MHz, specifically the 2303-2305 MHz band as well as the 2393-2395 MHz band, be carved out for primary use by amateur operators for weak signal work. The remaining 16 MHz, i.e., the 2300-2303 MHz, the 2305-2310 MHz, the 2390-2393 MHz, and the 2395-2400 MHz bands, should be allocated exclusively for wireless local loop service."

- The FCC has proposed amending Part 13 of the Commercial Radio Operator Rules to permit persons who have passed the examinations necessary to qualify for a license, but have not yet received the license, to temporarily and conditionally perform the functions of a commercial radio operator. (NPRM: June 18th. Comments close Sept. 1, 1994. PR Docket 94-58.)

- A professional auctioneer (Larry Latham) will be selling radio spectrum on July 28 and 29 to the highest bidder. The radio frequencies will be used by entrepreneurs for a new technology called interactive video and data service, IVDS allows television viewers to talk back to their TV set. The narrowband auction marks the first time that the FCC has sold parcels of the radio spectrum. The auction is the first of several. The Commission hopes to sell off some \$10 billion worth of radio spectrum during the next four years.

- The FCC's "Competitive Opportunity Plan" provides for buying spectrum at a discount. The next auction is tentatively scheduled for November when the FCC conducts broadband auctions for 1.8 to 2.2 GHz PCS spectrum. The pocket phone service is scheduled for deployment in 1996. PCS is eventually planned to be a \$12 billion business serving some 25 million people.

Nearly 2,100 PCS licenses will be sold to the highest bidder, the largest sale of public assets in history. Some bidders will be able to buy cut-rate frequencies. The FCC has designated nearly 1,000 of the licenses in smaller markets as "entrepreneurs' blocks."

Women, minorities, small businesses and rural telephone companies will be awarded "bidding credit", pay-back advantages and low interest loans. The credit represents a discount of 10% to 25%.

- Shock-jock Howard Stern had his radio show from Cleveland disrupted on June 10th when an employee from a competing station supposedly cut Stern off the WNCX-FM remote airwaves. Stern was in town to celebrate a mock funeral.

When The Howard Stern Show becomes number one in a market, Stern hosts a funeral for personnel at local competing stations. William Alford, 30

an employee of rival WMMS-FM, was found with wirecutters backstage at a local strip joint where Stern was originating his remote broadcast. Cleveland police have charged him with multiple felonies. WMMS-FM quickly suspended the disgruntled employee.

- Vanity Call Sign Reply Comments: Hugh W. Czerwonky, N6UB (Westerville, OH) believes the cost of amateur service vanity call signs should be \$25.00. He said he retained his call sign when he moved to a new district because reciprocal call signs were not available. "...the ability to reissue unused call signs will enable the Commission to re-establish the District Call Sign System while giving us Amateurs the call signs that more reflect the license level that Incentive Licensing was designed to accomplish."

Gerald Nemetz, W4NEX (Lynchburg, VA) wants Extra Class amateurs charged \$50 for a special call sign with priority given to Amateurs licensed over: A=45 years, B=35 years, C=25 years and D=10 years.

Kenneth Wideliz, AB6O (Los Angeles, CA) disagrees that 1x1 format call signs should be reserved for special events as suggested by the ARRL. He believes 1x1 call signs sold "...for a significant fixed fee or at auction presents a unique revenue raising opportunity." He also opposes giving priority to previous holders of call signs, those wishing to request the call sign of a direct family member, and clubs with lapsed club licenses and call signs. "A program favoring nepotism and neglect is not fair. ...Vacated call signs should be placed in the pool of call signs available for re-issue immediately."

Richard Stalls, K4KYO (Arlington, VA) opposes the vanity call sign system, period! He says it "...is frivolous, serves only the capricious vanity of a very few, provides no useful purpose, serves as a distraction from the Commission's regulatory mission, and does nothing whatsoever to further the purposes of the Amateur Radio Service. The proposed Vanity Call Sign amendment ...is an exceptionally ill conceived idea that enjoys little popularity among a majority of the amateur radio community and promises only to exacerbate problems that currently encumber the

Commission's ability to function."

Chris Imlay, N3AKD, ARRL attorney said the majority of the 109 comments filed favored the Vanity Call Sign proposal. "...the bulk ...favor a procedure whereby old call signs, once held, and call signs held by deceased close relatives of licensed amateurs, should be available on a priority basis to applicants." The League also said there is no need or authority for any privatization of the Vanity Call Sign program as suggested by The W5YI Group. "...radio amateurs are fully capable of correctly completing Commission forms and submitting them with payment correctly."

Mike Meehan, AK6N (Westlake Village, CA) likes the "consumer oriented" Vanity Call Sign rule change but is concerned about "trafficking" in call signs. He agrees that Vanity Call Signs should be issued to groups in stages. "My belief is that all classes of license be allowed through the first gate as a function of years in the amateur service. Instead of setting up gates as functions of class, set them as functions of seniority."

- A new method of "fingerprinting" credit cards will drastically reduce much of the nation's \$1 billion in credit card forgery. Unique magnetic micro-particles ("background noise") on each card serves as a fool proof means of identification and makes illegal duplication all but impossible. Process could also work on computer software.

- Radio Shack is opening about 100 "Travel Center" outlets inside National Auto/Truckstops, the nation's largest operator of full service truck and car highway service centers. They will stock about 250 products aimed at truckers and motorists.

- Thanks to new leadership, Prodigy is taking on a new look. The service has been redesigned to make navigation simpler. Deals have been cut with outside content providers. (For example: CBS will offer subscribers branded merchandise; ESPN will produce Prodigy ESPNNet Sports; and audio and video clips will be added as broadband networks evolve). Prodigy also has unveiled a \$10 million TV ad campaign. The 2-million subscriber service expects to turn its first profit this year.

STS-65 MISSION CARRIES SAREX INTO SPACE

The flawless 12:43 p.m. EDT launch (Friday, July 8th) of the Space Shuttle Columbia marks the beginning of the fourth Space Shuttle mission this year and the first of four missions in less than four months scheduled for the remainder of the year. STS-65, the 17th flight for Columbia, is planned for 14 days.

The primary payload of mission STS-65 is the International Microgravity Laboratory (IML-2), the second in a series of Spacelab flights dedicated to conduct research in life sciences and microgravity. The Shuttle Amateur Radio Experiment (SAREX) secondary mid-deck payload is also being flown since two of the astronauts are ham operators. SAREX operations were to begin at approximately 23 hours into the flight.

The crew of mission STS-65 are: Commander Robert Cabana (just licensed as KC5HBV) Pilot James Halsell; Mission Specialists Richard Hieb, Leroy Chiao, Donald Thomas (KC5FVF), Carl Walz; and Payload Specialist Chiaki Mukai.

Thirteen schools from the U.S., Japan, and Germany have scheduled ham radio contacts with the astronauts. Ten of these school group contacts will be performed using AMSAT's worldwide network of telebridge stations. The telebridge allows students to talk to the Astronauts through a remote ground station that is linked to the school through a phone bridge. The Goddard Amateur Radio Club, WA3NAN expects to retransmit some of these school contacts as part of their Shuttle Transmission activities. A limited number of schools will be "eavesdropping" on the STS-65 school group contacts via a listen only phone connection.

STS-65 Shuttle Amateur Radio Experiment (SAREX)

Launch: On time July 8, 1994 at 12:43 EDT (1643 UTC) from the Kennedy Space Center, Cape Canaveral, Florida. Earth Orbit. Inclination 28.45 degrees. Altitude 160 nautical miles.

Modes: FM Voice Callsign: KC5FVF
Packet Radio Callsign: W5RRR-1

SAREX Radio Frequencies: The crew will use separate receive and transmit frequencies. PLEASE do not transmit on the Shuttle's downlink frequency.

Voice: Downlink: 145.55 MHz (Worldwide)
Uplinks : 144.91, 144.93, 144.95, 144.97,
144.99 MHz (Except Europe)
144.70, 144.75, 144.80 MHz (Europe only)

Note: The crew will not favor any specific uplink frequency, so your ability to work the crew will be the "luck of the draw"

Packet: Downlink: 145.55 MHz
Uplink: 144.49 MHz

Information: Goddard Amateur Radio Club, WA3NAN, Greenbelt, MD, SAREX Bulletins and Shuttle Retransmissions: 3860, 7185, 14,295, 21,395, 28,650 KHz and 147.45 MHz (FM). ARRL Amateur Radio Station, W1AW, Newington, CT, SAREX Bulletins 3990, 7290, 14,290, 18,160, 21,390, and 28,590 KHz and 147.555 MHz (FM). Also, bulletins available on internet, via AMSAT ANS, Compuserve, and your local PBSS.

School Group Participation: 13 school groups will participate in SAREX with pre-scheduled direct and telebridge contacts. These include Sacred Hearts Academy, Honolulu, HI; Kline School, Costa Mesa, CA; Mountain View School, Phoenix, AZ; Granite Mountain Middle School, Prescott, AZ; West Monroe High School, West Monroe, LA; Our Lady Queen of Heaven, Lake Charles, LA; Richland Elementary, Ft. Worth, TX; West-Oak High School, Westminster, SC; Brentwood School, Sandersville, GA; Bair Middle School, Sunrise, FL; South Seminole Middle School, Casselberry, FL; Fronhofer-Realschule Ingolstadt, Bavaria, Germany; Tatebayashi Children's Science Exploratorium, Gunma, Japan .

SAREX Sponsors: American Radio Relay League (ARRL), Radio Amateur Satellite Corporation (AMSAT) and The National Aeronautics and Space Administration (NASA). SAREX is supported by the FCC.

QSL VIA: Send reports and QSLs to ARRL EAD, STS-65 QSL, 225 Main Street, Newington, CT 06111, USA. Include the following information in your QSL or report: STS-65, date, time in UTC, frequency and mode (FM voice or packet). In addition, you must also include a SASE using a large, business-sized envelope if you wish to receive a card. Lake County Amateur Radio Club in Munster, Indiana, has generously volunteered to manage the cards for this mission.

Shuttle Tracking: Current Keplerian elements to track the Shuttle are available from the NASA Spacelink computer information system BBS (205) 895-0028 and the ARRL BBS (203) 666-0578. Also, the JSC ARC BBS will have the latest element sets available during the STS-65 flight. The number is (713) 244-5625, 9600 baud or less.

On Board Equipment: SAREX, Configuration "C" - consists of the handheld 2-meter transceiver, spare battery set, window antenna, packet module w/power supply and TNC, SAREX headset, personal recorder, and the required cable assemblies. Configuration "C" is capable of operating in either the voice or data mode with amateur stations within LOS of the Orbiter. This configuration can be operated in the attended mode for voice communication and either the attended or automatic mode for data communications. Configuration "C" weighs: 45 lb (20.41 kg).

HF DIGITAL COMMUNICATIONS: AN OPPOSING VIEW

Joe Subich, AD8I of Huntington, WV is one of the 50 amateurs who participated in the feasibility study on unattended HF digital communications under the FCC's initial STA (Special Temporary Authority). Joe's enchantment with digital HF goes all the way back to the days of Model 15 RTTY and the Commodore 64. In close to ten years of operation, his station has handled more than 250,000 messages. We asked him for his views on the NPRM that seeks to authorize automatically controlled HF stations. (See Page 1)

W5YI: Does the NPRM for unattended HF digital operation present a potential for interference to other HF modes?

AD8I: Representatives of the STA stations and the Digital Committee agreed that this would not be a problem if unattended digital operation were confined to fairly narrow subbands at the high end of the CW and data segments - away from where DX, RTTY and other digital mode DX is operated. This all goes away, however, when the FCC authorizes a 'sham mode' of semi-automatic operation away from these subbands.

W5YI: Why is semi-automatic operation a 'sham mode'?

AD8I: Semi-automatic is where one of the two stations in a contact is manually controlled and the other is automatically controlled. The ARRL and the American Digital Radio Society proposal that stations may be automatically controlled anywhere where digital modes are authorized as long as the other station is under local control simply won't work.

W5YI: Why not?

AD8I: An automated message service on 14.025 MHz called into service by a locally controlled station still has the potential to cause interference to others operating on 14.025. Under the proposal, one may establish an automatically controlled digital station anywhere where digital modes are permitted provided that station does not connect with other automatically controlled stations. My reading of the NPRM is also that an automatically controlled HF digital may not solicit contacts. An automatic station may not call CQ.

There are automatically controlled digital stations running all over most of the bands today. The FCC rules are totally unenforceable since how do you know if the calling station is on manual or automatic control? The FCC has absolutely no way of determining if one of the stations has an operator at the controls or not.

I am really concerned about the precedence that this proposal sets. This is the first time that the Commission has absolved an licensee from interfering with other ongoing communications.

HF propagation characteristics being what they are, an automatically controlled station operating under the semi-automatic rules simply can not tell if it is causing interference. Because of the nature of the skip zone, an automatic station cannot determine if its received signal is interfering with stations at the other end of the link. Only a control operator listening on the frequency at the transmitting location can tell that. The calling station may be in the clear but the automatic station may not be.

For example, suppose you are in Texas and I am in West Virginia and I interrogate your automatically controlled station. You may very well hear my signal and start transmitting, but I may not hear a conversation on that same frequency involving somebody in southern California. Your station may hear both of us. When your automatic station comes up, it will cause harmful interference to previous users of the frequency. This is my biggest concern about allowing automatically controlled stations an exemption to operate outside the authorized automatic HF digital subbands.

The locally controlled station that causes the automatically controlled station to begin transmitting cannot possibly monitor conditions at the remote location of the automatic station. I could just leave my station on and anyone could call me whether or not there is communications activity on the frequency.

People who operate under semi-automatic control will tend to not operate in the authorized digital subbands. Gradually, the semi-automatic operation will stray further and further down into the band to get away from the QRM. I believe that this could cause a major interference problem. (Recorded July 8, 1994)

- **Scholarships at Surrey** - The University of Surrey (England, UK) is offering a limited number of postgraduate research student scholarships in satellite engineering commencing October 1994. These scholarships are directed toward high quality candidates seeking to undertake 3-year PhD research programs at the University of Surrey's internationally renowned Center for Satellite Engineering Research. Those selected will pursue engineering research within the context of the University's highly-successful small satellite program and in close collaboration with its technology transfer company - Surrey Satellite Technology Ltd.

Please send your CV, academic record and a statement of your areas of interest to:

Professor Martin Sweeting,
Center for Satellite Engineering Research
University of Surrey, Guildford, Surrey, GU2 5XH UK.
FAX: (44)-(0)483-259503
Internet: m.sweeting@ee.surrey.ac.uk
Inquiries must be received by 31 July 1994.

DIRECT BROADCAST SATELLITE TV ROLLS OUT

Largest launch of new consumer electronics technology in consumer electronics history.

With most of the nation is totally unaware, the age of high power Direct Broadcast Satellites (DBS) has begun. It will be in your neighborhood by year end! DirecTV (a subsidiary of GM Hughes Electronics) and USSB (Hubbard's United States Satellite Broadcasting) have quietly rolled out their DBS service. It is the first step toward a 500 channel service. Cable companies are (and have good reason to be) worried.

Both DirecTV and USSB are now operating in two markets (Shreveport, LA and Jackson, MS) under their combined test market code name of DSS (Digital Satellite Systems). Shortly, DBS service will debut in Little Rock, AR, Tulsa, OK and Albuquerque, NM. Plans are to expand nationwide in the fourth quarter. The initial target market is the 8 to 12 million homes not served by cable. The long range plans, however, are to satisfy the "...pent up demand for something better."

Both companies have contractually agreed to begin service with customer premises equipment exclusively manufactured for the first 18 months by RCA/Thomson Consumer Electronics. Beginning in 1996, DBS satellite will be provided by Sony and others.

To receive DBS you need a set-top digital satellite receiver/decoder box that links the TV to a small 18-inch satellite dish antenna. The cost of the needed equipment (including a remote control) is between \$650 and \$900 depending on the features. The higher priced versions can operate two TV sets. Major retailers such as Best Buy, Circuit City and Sears Brand Central are selling the product. Interestingly, so far, buyers are purchasing the \$69 installation kit rather than paying the dealer to install their satellite system.

Not to be outdone, *PrimeStar Partners* ...another DBS service run by a consortium of cable operators, is changing over from an analog to a digital format. This medium-powered DBS service began five years ago with just 10 channels. Unlike DirecTV and USSB, PrimeStar leases and maintains their home-based equipment which includes a 3-ft. diameter dish. The larger dish is needed due to the lower radiated power. PrimeStar has also secured \$565 million in bank financing to launch two more satellites.

PrimeStar recently signed an \$80 million multi-year deal with TCI (Tele-Communications, Inc.) the nation's largest cable TV operator and one of the seven PrimeStar owners. The other principles are General Electric (the satellite owner) and subsidiaries of Comcast Cable, Continental Cablevision, Cox Cable, Newhouse Broadcasting and Time Warner Cable. DirecTV and USSB are keeping their expansion path plans secret and a life-or-death struggle is definitely shaping up between cable and DBS.

The major thing that DirecTV, USSB, and PrimeStar offer that regular cable TV does not is a higher quality digital format which also allows more channels and therefore, a wider selection of programming. What they do not offer is local programming. Both the DirecTV and USSB DBS service automatically upload billing information from subscribers to their accounting centers once a week.

DirecTV offers 25 basic TV channels, 30 audio channels, 20 to 25 PPV (pay-per-view) movie-on-demand channels plus another 20 special interest programming channels. PPV movies are \$2.99 each. Subscription cost is \$5.95 to \$21.95 per month.

USSB's lineup consists of up to 8 basic tier channels plus premium channels at \$7.95 to \$34.95.

Using digital compression, PrimeStar now offers 77 channels (...soon to be 100) plus a PC-based information service at \$28.00 per month.

Initial response to the rollout has been stronger than anticipated! Stores in the Jackson, MS and Shreveport, LA have been reporting very brisk DBS equipment sales. They can't seem to get enough.

Make no mistake about it, DBS is planned to be VERY BIG business. And the companies involved (especially GM Hughes) have deep pockets! DirecTV plans to spend \$100 million this year on "brand building" sales promotion - half of it on advertising in the fourth quarter. The television advertising spots which focus on "Personalized TV" are already "in the can." Actor Joe Regalbuto (who plays TV newsman Frank Fontana on CBS "Murphy Brown") is featured. He walks viewers through the DBS service from the small antenna to the additional programming. Other ads promote the expanded movie selection and the superior quality of digital signals. The ad campaign begins in September along with massive magazine, newspaper, direct mail and possibly "infomercial" advertising! That is, if Thomson Electronics can keep up with receiving equipment demand. So far, they have not. A real product shortage could result.

DirecTV expects to have 600,000 subscribers by year end and are projecting a 10-million home subscriber base by the end of the decade.

PrimeStar, which in reality represents the cable industry's defense against loss of revenue to DBS, has upped their ad campaign to \$55 million.

And yet, still another DBS service is on the drawing board. "EchoStar" Communications has successfully sold \$335 million in high-risk zero-coupon debt (i.e. "junk bonds") to finance the construction and launch of its first two (of seven) high-power DBS satellites. The firm is already a major manufacturer of TVRO (backyard) dishes and has a network of 5,000 dish dealers. They may know something that the others do not. That is, how to get the needed receiving equipment into fast and widespread distribution.