

# W5YI

America'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.

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## IARU Region III Conference Opens in Darwin, Australia

Hosted by the *Wireless Institute of Australia*, the one week IARU Region III Conference opened on August 28<sup>th</sup>. It was held at the Carleton Hotel in Darwin in Australia's Northern Territory. The festivities included opening addresses by WIA President, Peter Naish VK2BPN and Barry Matson, an official from Australia's telecom regulatory agency. Both warned about the threats to Amateur spectrum.

VK2BPN said "Amateur Radio has a proud and enviable reputation. For more than 100 years amateurs have pioneered wireless communications often at times when others showed little or no interest. Most of the technical innovations of present day radiocommunications owe their initiation to work done by radio amateurs working as individuals or in select teams to improve their personal skills. Even today, the spirit of the very early work performed by people like Marconi and his contemporaries remains alive and well in the Amateur Radio Service.

"Because of our dominant position in the development of wireless communications the Amateur Radio Service worldwide has been permitted the use of a vast amount of radio spectrum with a minimum of regulation. This situation on which the traditions of Amateur Radio are based is now changing. It is perhaps ironic that the pioneering work achieved by amateurs, such as the opening of areas of the spectrum previously considered of little serious use by others, is now resulting in threats to the availability to radio amateurs of the very same

spectrum.

"More and more commercial interests are looking with hunger at the spectrum to which radio amateurs have access. New technologies are enabling these interests to promote services that the public at large will eagerly accept with little or no regard to the Amateur Radio Service. I believe that is a world-wide trend and not confined to a few countries.

"It is therefore very appropriate that we have the strong voice of the International Amateur Radio Union to continue to make the views of the Amateur Radio Service heard. For over 75 years the IARU has been carrying this message through its contacts and attendance at the ITU's World Radiocommunications Conferences. Now is no time for complacency. Together we must present Amateur Radio as an essential asset to human society. It is unique in that it has provided significant benefits to mankind for over a century and will continue to do so for many years to come. Through this theme I believe we can justify our use of the increasingly valuable radio spectrum which we are privileged to use."

### Remarks by the ACA

Australia's telecommunications regulatory agency is the *Australian Communications Authority* (ACA). Barry Matson, Executive Manager of the Radiofrequency Planning Group talked about the future of Amateur Radio as he saw it. He said he



was "highly optimistic because, although I can see big challenges ahead, I am personally confident that the amateur community can overcome them."

Matson summed up the Government view that "Amateurs must compete in the sense that they continue to justify, in the prevailing market environment, the resources that they are consuming. In terms of various users of the radio spectrum, it will be the survival of the fittest," he said.

Matson believes that the key factors for the Amateur Service are:

- ▶ Continued access to spectrum and
- ▶ Maintaining the relevance of amateur radio

"I do not believe that amateurs can afford to let themselves become curators of historically interesting equipment or techniques.

"The amateur community needs to appreciate where it stands in relation to other spectrum users. The usage of the radio spectrum has changed so much during the last 20 years that the long cherished reasons for government support of the amateur radio hobby are, quite frankly, no longer convincing.

"Cordless applications in telecommunications, the proliferation of satellite services, and heavy dependence of business, transport and the military on new radio communications and navigation devices means that spectrum has become a scarce and extremely valuable commodity.

"Auctions of UHF spectrum suitable for mobile phones are topping up the treasuries of many Governments, and this is focusing attention on the importance of efficient usage of this valuable resource. Even long established Defense applications are being pushed out in favor of new telecommunications services. If national security ranks a second priority to telecommunications, then where does that leave amateur radio?

"Don't panic just yet. There are some options... Think of it as a strategic plan that might start like this:

## Strategic assumptions

- ▶ "Access to sufficient appropriate frequency spectrum is essential if Amateur Radio is to survive;
  - ▶ Pressure on governments to 'recover' spectrum from Amateurs will increase to where it will become irresistible on some bands within a few years;
  - ▶ Other non-profitable (in a money sense) spectrum users face the same challenge; and
- The same issues exist in all amateur radio countries.

## Strategic Plan Options

### Option 1. Form strategic compatible partnerships, sharing strengths.

"This strategy recognizes that it is possible to share spectrum between different services without either party suffering serious interference, and that this

makes the combined usage more efficient and therefore defensible.

## Some additional assumptions

- "Defense needs huge amounts of spectrum in time of war, or during exercises, but does not make use of much of it the rest of the time;
- Amateur privileges are likely to cease in time of war;
- Many amateurs will join the defense services, and their experience on the same bands would be valuable;
- Amateur operators (compared to commercial) are more capable of coping with occasional interference from peacetime defense operations;
- Defense must learn to operate in a crowded spectrum to cope with electronic warfare, and so may even welcome the realism of amateur interference on some bands;
- Amateurs are good at political lobbying to protect their spectrum assets and defense has the moral strength of protecting national security.

"These assumptions lead to the conclusion that amateur radio and Defense are natural partners.

"An important aspect of being a professional radio user of the 21st century is to learn how to operate within tight spectrum sharing agreements, and also how to conduct oneself when interference does occur. Amateurs should not be denied experience of this aspect of modern radiocommunications.

"This sharing is already happening on the UHF Amateur band. Defense is the primary user of 420 to 450 MHz. However, even on these bands there is likely to be some nibbling by commercial or state government entities who know how much money can be derived there from trunked mobile radio services. You must keep in mind that the primary user, Defense, will have the most say about prospective release of the band to telecommunications or trunking, and if the military users feel that they can do without it, the rug is likely to disappear from under the amateurs.

"Sometimes new technology will permit spectrum sharing without interference. A prime example is digital trunked radio systems. In fact, with all government and commercial mobile radio systems expected to move to trunking over the next decade, it seems likely that amateurs will soon be preserving an obsolete technology if they don't do likewise.

"So perhaps the best way to preserve your UHF mobile and hand-held spectrum access would be to negotiate for talk groups on a government or commercial trunking system. A powerful negotiating point would be if you are already a secondary user of a band that is being turned over to trunking.

### Option 2. Fight to retain at least some exclusive use where you have it now



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"This option acknowledges the inevitable encroachment of amateur spectrum in the future but tries to contain it in the critical zones to an amount sufficient for realistic needs. You would ask yourself questions like. 'How much spectrum do I really need on this band to operate effectively?'

- ▶ Do I need it all of the time?
- ▶ How much interference can I tolerate?
- ▶ Could I share with another user who is already there?
- ▶ Could we find a new sharing partner to go in with?
- ▶ What is the extent of commercial demand?
- ▶ Are there pressures on the Government to auction it?
- ▶ What is the situation in other countries?
- ▶ What are the licensing arrangements on this band?
- ▶ How much would it cost to license enough channels for Amateur Radio?
- ▶ How could these fees be funded?

"Sure, these are tough questions, but that is the real world of radiocommunications today, and after all, one of cherished the aims of the hobby is to help people to learn to operate in the real radio world.

"You may feel that you already have a license for these bands, so why am I suggesting that you license spectrum. The amateur license fee is in fact a very generous concession by the government in relation to the amount of spectrum it gives access to and compared with the fees paid by commercial and government users.

"My group in the ACA develops licensing policy, and I feel confident that we could negotiate a deal in which amateur radio purchased a system licence for a particular band.

"These licences may give exclusive, primary or secondary access to qualified amateurs and associated rights for protection. I understand that this strategy poses considerable challenges to the amateur community in raising funds and controlling access to those who have contributed payment to use the subject channels. I assume that you are up to this challenge.

## Problem:

"How do we improve the profile of amateur radio with government, other spectrum users, and potential amateur operators.

"This must be a major concern to Amateur Radio governing bodies and I would like to promote a strategy that I have copied from an FCC colleague, Dale Hatfield (W0IFO) and I urge you to check out his speech - which may be found at: <<http://www.fcc.gov.Speeches/misc/dnh061700.html>>

## Strategic Assumptions

- "There are sound economic reasons for radio communications design to head in the direction of common hardware platforms employing digital signal processors and smart software which can be upgraded and changed

at will;

- Ever more spectrum efficient Digital methods of radio transmission are essential and inevitable;
- Many potential radio amateurs are being lured away from the hobby by their fascination with computers;
- Component miniaturization is making realistic hardware-based experimentation very difficult to do at home;
- Truly advanced radiocommunications experimentation in software is practical to do from the home;

## Strategy

"The Americans call it the Software Defined Radio, and they are moving in this direction in a very big way. This radio will in some ways resemble a PC, having different plug-ins for each peripheral. These plug-ins might be front-ends for different spectrum bands, or outputs for listening, watching or hard copy, and a PC for programming. At the heart will be a DSP array controlled by an open operating system. Software capable of decoding and de-multiplexing complex, high bits/MHz transmission modes will run on this operating system.

"With systems like this in their shack, amateurs will all be truly able to participate at a professional level in state-of-the-art radio experimentation. Instead of salvaging obsolete left-overs amateurs with a low budget can move up to the real thing.

"Governments and industry will see amateurs making a valid contribution to the development of spectrum efficient radio technology and using the resources that they have wisely.

"This strategy will be hard for most because it confronts amateurs with the same stark technical educational challenges that have been faced for some years now by engineers and scientists in this field. However, it is the only strategy that could lead to a future golden age of amateur radio.

"I would like to leave you with the somber thought that it is neither the Internet, digitalization, or miniaturization that is creating the greatest challenge to the future of amateur radio. Instead, I believe that the real challenges are:

- continued access to appropriate frequency bands;
- remaining relevant in what is now an extremely complex technical field; and
- the need to confront big business in a sophisticated way.

"Finally, on behalf of the ACA and the Federal Government, I would like to thank the IARU and WIA for the strong support they have given to sensible proposals at the recent World Radio Conference. I would also like to express our thanks and admiration to Sydney amateurs for agreeing to temporarily surrender their UHF spectrum to Games organizers during the Olympics. These are fine examples of the kind of cooperation that will help preserve this great hobby of amateur radio."



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## IARU RIII SETS COURSE FOR FUTURE DIRECTION

By Jim Linton VK3PC, IARU RIII Conference Media Officer

The IARU RIII 11th Conference held in Darwin, August 28-September 1, 2000, considered a wide range of issues and many of them were concerned with protecting and furthering the cause of amateur radio within the region, and globally.

The region's 17 member societies participating in the conference demonstrated their willingness to tackle the numerous issues facing the Amateur Service and Amateur-Satellite Service in the 21st century.

Conference chairman, and WIA President, Peter Naish VK2BPN, commented on the positive approach taken throughout the week-long conference, when he said it

clearly showed that IARU RIII spoke with a single voice.

The ITU Radio Regulation S25, that currently requires Morse code proficiency in amateur license testing, generated considerable discussion during conference Working Group 3 (WRC-03).

However, at the end of the day and after a number of wording revisions, the general intent of recommendations in a WIA input paper on the ITU RR S25, which is to be reviewed at WRC-03, were adopted.

The Conference resolved to support lowering the amateur licence Morse code test speed as a temporary measure, and the ultimate removal of Morse being an ITU license requirement.

At the final plenary session a motion, proposed by WIA, seconded SARTS (Singapore Amateur Radio Transmitting Society), read:

"IARU Region III strongly supports Morse code as an effective and efficient mode of communication. However, it believes that the position of Morse as a qualifying criterion for a HF amateur license is not relevant to the healthy future of amateur radio. Therefore:

- 1: That IARU Region III urges member societies to seek, as an interim measure, the reduction of all Morse code testing speeds to five words per minute.
2. a) That setting aside any previous relevant decisions of earlier Conferences, a policy of the removal of Morse code testing as an ITU requirement for an amateur license to operate on frequencies below 30 MHz be adopted by IARU Region III.
3. b) Further, we recommend that the Administrative Council adopt the above position as IARU policy."

The motion was passed, with ARRL voting against, and HARTS (Hong Kong Amateur Radio Transmitting Society), whose members had three years ago supported retention of a Morse code as a license requirement, recorded an abstention.

Also related to ITU RR S25 was another motion in which the Conference addressed concern about the preliminary draft recommendation for WRC-03 (M-AOQ, ITU-R Document 8A/TEMP/91-E), which includes reference to "Radio Telegraphy" under a list of Operating Skills for the amateur license.

The concern expressed by delegates was that "Operating Skills" could be misunderstood, and in fact it had been wrongly seen by some in the amateur radio fraternity as indicating the retention of a Morse code telegraphy skill.

Delegates heard that in ITU terminology, Radio Telegraphy meant all digital modes of transmission. In a motion proposed RSGB (Radio Society of Great Britain), seconded ARRL, the conference resolved to instruct the IARU RIII representatives on the IARU Administrative Council to replace in the M-AOQ the term "Operating skills" with "Methods of communi-

cation."

The conference noted crowding in the 40 meter band being experienced particularly in countries with narrow allocations, and reaffirmed the IARU objective of obtaining an exclusive worldwide 7MHz allocation of no less than 300 kHz, was reaffirmed. The conference instructed the Directors of IARU RIII to treat achievement of this objective as a matter of the highest priority, and member societies in the region were urged to do all they can in support.

The emergency and disaster communications traditionally provided by the Amateur Service is set to be strengthened as a result of the Conference recommending the establishment of a regional committee for disaster communications.

It will seek to appoint disaster communications coordinators within Region III, identify the recurring needs for disaster communications, and identify resources that could be deployed to provide international assistance in times of a disaster.

The Conference also gave its support for seeking a band allocation in the vicinity of 5MHz, and to consider defining HF band segments (not 10, 18 or 24MHz) for use during international disaster emergency communications. It was noted that IARU RII has already defined such segments in its band plans.

Among many other resolutions were those related to:

- Harmonization of licensing in IARU RIII. A new position was established to continue surveying member societies on their amateur license syllabuses and examination standards, and reporting further on the findings.
- Monitoring of interference from non-amateur transmissions to amateur satellites. The objective is to establish a series of terrestrial monitors, similar to the IARU Monitoring System (Intruder Watch) to gather information on intruders so action can be taken against them.
- Internet based amateur license education, and on-demand computerized license testing, which are now available in Australia and New Zealand respectively.
- The need for radio societies to be alert to the problems associated with so-called Low Interference Potential Devices (LIPDs), and to lobby against their licensing on the 70cm band, particularly where amateur repeater activity occurs.
- The desirability of radio societies to lobby their national administrations to adopt the self-assessment method for amateur stations to enable them to meet Electromagnetic Radiation (EMR) standards, backed up by EMR education programs for radio amateurs.
- The seeking of an amateur allocation for a Low Frequency band, either 165-190kHz and/or 135.7-137.8kHz. It is existing IARU policy to pursue LF bands in all three IARU regions.
- The emergence of high speed data technology, such as xDSL, and its intrusion into amateur bands.

The contributions of six radio amateurs to the IARU Monitoring System (Intruder Watch) were recognized by the awarding of certificates commending them for their long term efforts.

They were: Rohan Wahrich ZL1CVK, Gordon Loveday VK4KAL, B.L. Manohar VU2UR, Isamu Kobayashi JA0AD, C.C. Robertson VK4AKX, and N. Yatheedandran 9V1JY.

One of the final matters decided at the Conference was the election of the IARU RIII directors for the next three years.

They are Fred Johnson ZL1AMJ, Peter Naish VK2BPN, Yong S. Park HL1IFM, Yoshiji Sekido JJ1OEJ, and KC Selvaduras 9V1UV. The directors appointed Fred ZL1AMJ as chairman. The Conference resolved that the IARU Conference in 2003 will be hosted by CTARL (Chinese Taipei Amateur Radio League) and held in Taiwan.



## CUTTING EDGE TECHNOLOGY

■ **Can't find the RFI source?** Check the cables in your system, particularly home-made ones. One engineering study estimates that 80% of radio-frequency interference (RFI) problems come from cables. With today's digital signals running even faster, gaps in shielding are not as forgivable as they used to be. Use only completely shielded cables. Don't make pigtail grounds by twisting the ground shield wires into one large cable, either. That reduces the cable's shielding efficiency considerably.

■ **Time to change the coolant.** Machine tools, especially computer-controlled lathes and mills, require constant coolant to be applied to the workpiece to cut down on heat and friction. Used coolant is recirculated back to the workpiece again. But it doesn't take long for the coolant to wear out, as the water in it eventually evaporates and changes the concentration of the coolant. A handheld electronic refractometer measures the amount of total solids in a liquid, and tells the operator when it's time to change the coolant.

■ **"Where's my screwdriver?"** Airframe mechanics don't like to admit it, but hand tools do occasionally get left behind accidentally inside airplanes. There are hundreds of places for tools to hide, and grounding a plane to find a wrench won't sit well with supervisors. FOD Technology Group offers a portable device called Aeroprobe that helps locate tools inside airplanes. First, you pass an activator over your tools, which gives them a mild magnetic signature (the tools must be able to maintain a magnetic field). Later, if you need to find one of the tools, Aeroprobe senses the magnetic field through the skin of the airframe and tells you through a pair of headphones exactly where to look.

■ **New type of isolator available.** Opto-isolators have been used in millions of electronic circuits for years. They help transform signals from one format into another through the transmission of light. Digital signals are often fed through opto-isolators to drive much larger amplifiers. But opto-isolators have an inherent problem: they aren't very fast. Analog Devices is releasing a new type of isolator, based on magnetism instead of light, which the company says will be a drop-in replacement for an ordinary opto-isolator, with a much higher bandwidth.

■ **"This is a capacitor?"** United Chemi-Con's new UTOR Series of capacitors look rather unusual, because they look like ordinary blue computer-grade electrolytic capacitors -- except for the large hole in the middle. Running lengthwise, the hole through the capacitor allows more efficient cooling because the core can get rid of its heat more easily. Air can be blown through it, a heat sink can be installed in it, or fluid pumped through it. In effect, the UTORs are toroidal capacitors.

## EMERGING COMMUNICATIONS

■ **Many commercial jets now carry in-flight entertainment systems,** such as radios, television monitors and even computer screens for each seat. But these units remain rather expensive, and they do break down once in a while. Airlines are not keen on this, since it takes time and money to repair or replace individual units. Passengers seeing a blank computer screen in one or more seats may therefore wonder what else may be wrong on the plane.

■ **"Why didn't someone think of this before?"** Dewalt Industrial Tool Co. offers a NiCad battery-pack charger with a built-in radio receiver! If you've got to charge batteries, you might as well listen to the ball game while you're doing it.

■ **HDTV may not make the deadline.** The *National Association of Broadcasters* recently announced that over 75% of America's broadcasters think the 2006 deadline isn't enough time to switch all TV stations over to HDTV, and that it should be extended. Cable companies don't like HDTV because the data-hungry signals eat up too much bandwidth. Advertising companies haven't leaped into the breach because very few people are buying HDTV receivers, so there is little return on investment in that market now. HDTV sets are still far too expensive for most people, and even if they were cheap enough, it is doubtful that most consumers see HDTV as anything more than a solution looking for a problem. Almost three million DVD players were sold in 1999, while not even 20,000 HDTV sets found their way into homes.

■ **If you're made out of money, put Surround Sound in your corporate jet.** DirecTV systems, multi-disc CD players, VCRs, and DVD systems are now being installed in custom applications for business jets. Separate cabins can have separate en-

tertainment systems and remote controls.

## COMPUTER INFO

■ **New supercomputer being built.** IBM's newest powerhouse, the RS/6000 SP, will boast over 12 trillion floating-point mathematical operations every second (12.3 teraflops)! The Department of Energy will use the new supercomputer to study theoretical nuclear weapon behavior. (In a digital throwback, the RS/6000 SP will be even larger than its great-grandfathers, such as ENIAC, which filled entire rooms.)

■ **Dual-screen computers becoming more popular.** The release of the latest Windows software updates allows two separate video monitors to be driven at once, which is a boon to computer-aided design (CAD) users. Rather than tie up processor time by surfing through a maze of menus to exchange applications, a graphics-intensive image can have one screen all to itself. The other screen can take care of routine operations, such as e-mail, word processing, and spreadsheets. Data can still be exchanged between monitors.

■ **It's not a stick, it's not a flashlight, it's a multimeter!** Wavetek makes at least two electronic measurement devices that look more like nightsticks than digital multimeters. The ST75 measures current, voltage, and resistance, while the TM45 measures temperatures. Their ergonomic shapes make them easier to handle and use in tight spaces, such as electrical cabinets. They're easier to carry on the belt, too.

■ **Are 35mm slides dying off?** They might as well. Everyone is switching over to computer-based visual presentations. Old-style slides are expensive to produce, can be installed backwards accidentally (it happened to all of us), are at the mercy of projector bulbs, and take time to update. Most visual presentations are based on up-to-the-minute information, so it makes more sense to connect a laptop computer to a video projector in the boardroom. Try to find a place to make a batch of 35mm slides, while traveling. It's easier and less expensive to draw the graphics you need, in your own hotel room, on a computer screen.

■ **Slow down computer games by a simple command.** Video games run faster if the graphics processors get to take it easy by not having to create eye-popping images in every available pixel. During action



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scenes, in fact, designers can get away with less resolution in a moving object. But clever players can slow down a high-paced, hard-to-play game by telling the software to improve its resolution. Setting all graphics parameters to maximum can really slow down a Pentium-based system, rendering fast player responses unnecessary.

■ **Get rid of the video games, speed up the computers.** Many companies have learned that their lack of hard-drive storage space is due to employees loading video games onto them. Video games eat up enormous chunks of hard drive space and slow down network performance. To combat this, another computer program called "AntiGame" searches out and erases thousands of games.

■ **Microscopes can now be controlled by computer!** RS-232 links let you control focusing, lamp brightness, aperture size, and up to 25 other options. A PC can control autofocusing. Some microscopes even contain their own microprocessors.

■ **Why flight simulators?** Software publishers will tell you that detailed flight simulator "games" are not the most popular programs. Most consumers want games that are easy to learn, yet difficult to master. Even experienced pilots can face a steep learning curve when learning all of the various commands on the keyboard. Different types of planes (with different handling capabilities) can take dozens of hours of practice. The time it takes to program and debug such a complex game gets very expensive, and only a small group of purists will flock to it. But the payback is just good enough to keep the cycle going. (The same holds true for radio stations that play nothing but classical music; they almost always live in the cellar when it comes to ratings, but the demographics of the people who listen to them means that the stations remain profitable.)

■ **More help for animators.** For decades, animators created cartoons by "roughing out" the action on a series of individual sheets of paper, held in place with registration pins to keep cartoon images from jumping around on film. It's still used in some cases, but has always been a long, time-consuming process. An artist must continuously flip back and forth among the sheets, double-checking where each successive image is placed. But new software for high-end computers lets animators speed up their work, with an "onion skin" feature. An image on the screen can be drawn against a previous image as a

background. The artist can therefore tell exactly how the new image should be changed slightly. It's like looking at successive sheets of paper on a lightbox. After drawing the images, the computer can "play back" the animation in real time.

■ **Stand-alone CD copier available.** TASCAM makes a dedicated compact-disc copier, the CD-D4000, which lets you copy a target disc from a source disc in real time. It can "burn" a new disc in just a few minutes, automatically verifying the audio or digital data. Two pushbuttons and an LCD on the front panel are all you need to choose copying options.

■ **Full-color video displays are getting ever smaller.** VL Engineering's 2.5" x 3.5" high-resolution LCD monitor can accept NTSC video input. Three-Five Systems makes an SVGA or SXGA-resolution color display smaller than a postage stamp, using silicon-on-glass technology.

■ **How to deal with computer-generated RFI.** Computers keep getting faster; that's a fact. All the digital pulses inside computers come from one source: the main clock. The clock runs the microprocessor, and is usually generated from a quartz crystal or other type of oscillator. Until now, the speed of the clock has always been constant. But as a method of cutting down the radio-frequency interference that these square-wave digital signals emit, Spread-Spectrum Clock Generation (SSCG) modulates the clock signal with a low-frequency signal that changes the speed of the clock. This spreads RF emissions over a much broader spectrum, lowering the possibility of "jamming" one particular frequency.

## INTERNET NEWS

■ **Check your e-mail at 40,000 feet? Yep!** Boeing is planning a high speed two-way in-flight Internet and entertainment service to air travelers by next year. The potential market is huge!

According to the Wall Street Journal, 90 percent of Internet users send e-mail, 85 percent surf the World Wide Web, 46 percent look up weather, 77.8 percent use search engines, 52 percent visit company/product sites, 33.8 percent read newspapers and magazines. Approximately 52 million travelers used the Internet to plan trips and make travel reservations in 1999, up 54 percent from 1998 and up 1,500 percent since 1996.

And online bookings are taking off,

with 16.5 million people planning trips and making reservations online, representing a 146 percent increase since 1998. In the next 24 hours, 3 million people will board 42,300 flights around the world.

■ **"The Connexion by Boeing" service** will be delivered through a high-speed satellite wireless network that uses specialized, phased array antennas to transmit data to laptop PC carrying passengers. All passengers will be able to use the service simultaneously which will be available to all aircraft, not just those made by Boeing.

Cost is targeted at \$17.50 an hour. Download speed will be about 5 megabits per second, with upload speeds of 1.5 mps. Boeing is negotiating with various cable channels, such as CNN, ESPN, Eurosport and Euronews, to fill the four television channels that will be available on the system. Also available will be flight-specific and crew information services to the airlines. Boeing is in the process of obtaining licenses to operate the service. Check: <[www.boeing.com/special/connexion](http://www.boeing.com/special/connexion)>

■ **"Order now."** At least one professional consulting firm predicts that nine-tenths of American companies will do some of their purchasing over the Internet by the end of next year.

■ **Not all musicians hate the Internet.** Some groups actually welcome the potential of free advertising. They post items on their Websites that were previously impossible, such as songs in progress and video feeds from a recording session. This helps generate and keep interest in an upcoming album.

■ **"Shall we play a game?"** One problem with two-player video games over the Internet is a time lag between player response and computer response. If two or more players are separated by great distances, a network server can be tied up with enough traffic to make the game play too slow for comfort. That's why software already exists that lets players scan the Internet for servers that have the fastest response times.

■ **What started as Earth's biggest bookstore is rapidly becoming Earth's biggest anything store.** Amazon.com's main site offers millions of books, CDs, DVDs, videos, toys, tools, and electronics. It also conducts auctions for items ranging from art to real estate.

Its services include a scheduler, address book, and a comparison-shopping tool. Expansion is propelling the company in many directions; it owns stakes in online sellers of



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pet supplies, prescription drugs, groceries, and will soon begin operating a co-branded toy store in partnership with Toys R Us.

Amazon.com has become a model for Internet companies by putting market share ahead of profits (of which it makes none!) and making acquisitions funded by meteoric market capitalization. Founder Jeff Bezos and his family own one-third of the firm.

■ **Amazon has now introduced a new car online buying service** in partnership with Greenlight.com which features no-haggle pricing and one-stop financing.

The service gets the cars from Internet knowledgeable dealers across the United States. Less than a year old, Greenlight.com has established alliances with over 2,000 dealers and such automotive financing companies as Chase, AmeriCredit and E-LOAN. Car buyers can browse and search by make or model, or compare two cars side by side in Greenlight's virtual showroom. Consumers can also specify the precise options they want and configure their car online at <<http://www.greenlight.com>> .

Ford and General Motors also plan to begin selling vehicles direct to consumers at their FordDirect.com and GMBuyPower.com Web sites. Some 5 million -- nearly half -- of new car buyers last year used the Internet to at least research their new car choice. A major research study found that only 2.7 percent of buyers actually purchased their vehicles online.

And Amazon may be branching out even further. They have registered a number of automotive-oriented domain names including usedcarsamazon.com, newcarsamazon.com, sellcarsamazon.com, carclassifiedsamazon.com and partsamazon.com.

## WASHINGTON WHISPERS

■ **Congress is very concerned about fake IDs produced online.** Federal officials are examining Internet sites after undercover agents with fake IDs entered airport secure areas and several government buildings, including FBI headquarters, the Justice Department and the CIA.

The fake credentials were produced from materials marketed on Internet sites and from "off-the-shelf" computer graphics programs. Underage students are also a big user of fake credentials. Supposedly

Social Security cards, birth/death certificates, "green" cards, student IDs, military IDs, US passports and driver's licenses for all 50 states are readily available at \$35 to \$150 each. Some even contain realistic holograms and black magnetic stripes.

One site offers a new identity package (for \$650!) which includes a birth certificate, social security card, drivers license, library card of local public library, U.S. passport, diploma from any university or college for any degree, past work references and other vital information the government would normally keep on you since your birth. The social security number is legitimate ...filed with your new name and a copy of your fake birth certificate. The fake IDs are sold "For novelty purposes only" which is not written on the card. Don't ask us for the web addresses.

■ **On August 31<sup>st</sup>, the FCC released an Order amending Part 15 Rules regarding Spread Spectrum devices operating in the 2.4 GHz (13-cm, 2400 - 2483.5 MHz) band.** This proceeding was initiated in response to a letter filed by the *Home RF Working Group*. This spectrum is also shared by the Amateur Service on a secondary basis.

The new Part 15 Rules, however, apply to the general public and not the Amateur Service. While the public is authorized a maximum of 1 Watt output power, Amateurs may radiate up to 100 W providing automatic transmitter control (limiting output power to that which is required for communication) is used.

The Order allows permits unlicensed frequency hopping spread spectrum transmitters operating in the band to use a minimum of 15 hopping channels spanning a total of 75 MHz. The average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 30 second period.

The new rules will allow for hopping channels up to 5 MHz wide. "The wider bandwidths will permit these systems to provide higher data speeds, thereby enabling the development of new and improved consumer products such as wireless computer local area networks and wireless cable modems," FCC Chairman Bill Kennard said. "The Commission's action represents a reasonable engineering compromise between the risks of increased interference and the desire to accommodate new technologies."

## AMATEUR RADIO

■ **California PRB-1, SB-1714, has now passed both houses and is heading to the governor's office for signature.** SB-1714 was introduced into the California legislature last February. Amateur Radio operators in California are being urged to write the governor to encourage him to sign the measure into law which must be signed by September 30.

The wording is similar to PRB-1 and specifies that any ordinance adopted by "...any city or county that regulates amateur radio station antenna structures shall not preclude amateur radio service communications but shall reasonably accommodate amateur radio service communications."

The bill also provides up to \$100,000 to fund the preparation and publishing of "...a technical assistance bulletin for use by local officials and planners in the preparation and adoption of local ordinances regulating amateur radio service antennas [and] to prepare a model ordinance on local regulation of those antennas. ..."

Letters to the governor may be sent by email to [graydavis@governor.ca.gov](mailto:graydavis@governor.ca.gov); faxed to 916-445-4633, or mailed to Gov. Gray Davis, State Capitol Building, Sacramento, CA 95814. The bill can be found at <<http://www.leginfo.ca.gov>> .

■ **Amateur Radio Enforcement:** The FCC is requiring **Lazaro P. Duarte KF4WSM** (Miami, FL) to retake his Technician Plus Class license exam (Element 1 and 2) prior to October 15, 2000.

■ **Julio A. Cedeno N2GRM** (Hollywood, FL) has been warned by the FCC that he must adhere to the Amateur Service identification rules or face enforcement action. He apparently has ignored several Official Observer Notices.

■ Over the past three years, **Gary D. Gray W6DOE** (Anaheim, CA) applied for -- and was granted -- 30 Amateur Radio club call signs. On August 29<sup>th</sup>, the FCC cancelled 22 of these club call signs. He gets to keep eight of them: K4AI (APCO International Amateur Radio), W6ID (CPRA Amateur Radio), K6ES (Orange County Communicators), W6VT (Orange County Comm Employees), W6KBF (Knott's Berry Farm), N8RG (Sierra Amateur Radio Club), W6PF Stancil Memorial Club) and W6VT (Orange County Comm Employees.)



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## AMATEUR RADIO SERVICE CENSUS BY STATE AND LICENSE CLASS

Currently Licensed Individual Stations - As of September 1, 2000

STATE	EXTRA	ADVANCED	GENERAL	TECH PLUS	TECHNICIAN	NOVICE	TOTAL
AK Alaska	412	408	606	436	1,134	185	3,181
AL Alabama	1,523	1,349	1,962	1,557	3,724	425	10,540
AR Arkansas	985	852	1,182	999	2,568	326	6,912
AZ Arizona	2,094	2,155	2,910	2,323	5,472	660	15,614
CA California	10,912	12,058	16,245	16,383	39,111	8,674	103,383
CO Colorado	1,785	1,697	2,272	1,912	3,865	651	12,182
CT Connecticut	1,316	1,170	1,863	1,336	1,891	802	8,378
DC Dist. Columbia	65	78	104	48	83	33	411
DE Delaware	228	192	296	239	343	86	1,384
FL Florida	5,492	6,455	9,381	6,136	9,299	3,310	40,073
GA Georgia	2,070	2,130	2,812	2,345	4,463	745	14,565
HI Hawaii	478	397	547	516	1,053	269	3,260
IA Iowa	973	1,096	1,447	885	1,659	475	6,535
ID Idaho	549	478	790	645	1,730	184	4,376
IL Illinois	3,306	3,130	4,719	3,584	6,391	1,713	22,843
IN Indiana	1,962	1,883	3,030	2,493	4,541	977	14,886
KS Kansas	944	901	1,556	1,132	2,251	508	7,292
KY Kentucky	1,175	1,006	1,579	1,400	3,086	581	8,827
LA Louisiana	1,006	1,033	1,334	1,045	1,996	411	6,825
MA Massachusetts	2,390	2,046	3,059	2,414	3,387	1,192	14,488
MD Maryland	1,895	1,700	2,238	1,774	2,836	771	11,214
ME Maine	662	558	1,009	684	1,219	297	4,429
MI Michigan	3,013	2,763	4,371	3,333	6,383	1,238	21,101
MN Minnesota	1,629	1,531	2,325	1,580	3,016	613	10,694
MO Missouri	1,828	1,750	2,654	1,853	3,914	748	12,747
MS Mississippi	662	680	899	655	1,586	225	4,707
MT Montana	429	384	622	414	1,073	177	3,099
NC North Carolina	2,622	2,479	3,429	2,873	5,835	1,310	18,548
ND North Dakota	221	174	363	244	480	88	1,570
NE Nebraska	554	584	964	604	979	231	3,916
NH New Hampshire	857	621	966	825	1,370	310	4,949
NJ New Jersey	2,514	2,381	3,293	2,705	3,526	1,402	15,821
NM New Mexico	773	749	939	694	2,007	183	5,345
NV Nevada	623	613	999	654	1,567	202	4,658
NY New York	4,452	4,346	6,576	5,339	8,841	3,201	32,755
OH Ohio	4,175	3,752	5,907	5,469	8,992	2,057	30,352
OK Oklahoma	1,230	1,148	1,524	1,370	3,400	471	9,143
OR Oregon	1,673	1,737	2,844	2,061	3,973	765	13,053
PA Pennsylvania	3,831	3,491	5,278	3,999	6,048	1,718	24,365
PR Puerto Rico	346	502	825	1,761	1,076	2,083	6,593
RI Rhode Island	380	279	513	482	492	218	2,364
SC South Carolina	1,016	905	1,515	1,038	1,995	356	6,825
SD South Dakota	249	252	366	193	415	103	1,578
TN Tennessee	2,025	1,899	2,630	2,348	4,347	692	13,941
TX Texas	6,245	6,124	7,895	6,277	13,226	1,981	41,748
UT Utah	741	674	937	1,418	4,596	296	8,662
VA Virginia	2,699	2,454	3,290	2,722	4,775	1,033	16,973
VI Virgin Islands	51	32	70	35	90	21	299
VT Vermont	358	248	431	328	768	114	2,247
WA Washington	3,081	3,042	4,621	3,959	8,024	1,389	24,116
WI Wisconsin	1,531	1,465	2,258	1,486	3,259	585	10,584
WV West Virginia	791	606	1,070	962	2,708	342	6,479
WY Wyoming	232	203	305	228	547	81	1,596
Other	224	139	210	236	730	77	1,616
<b>Total</b>	<b>93,277</b>	<b>90,779</b>	<b>131,830</b>	<b>108,431</b>	<b>212,140</b>	<b>47,585</b>	<b>684,042</b>
% (Percent of Total:)	13.6%	13.3%	19.3%	15.9%	31.0%	7.0%	100.0%

"Other" Includes U.S. Island Possessions and U.S. military overseas addresses.



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## AMATEUR RADIO STATION CALL SIGNS

...sequentially issued as of the first of September 2000:

Radio District	Group A Extra	Group B Advanced	Group C Tech/Gen.	Group D Novice
0 (*)	AB0OR	KI0RW	(***)	KC0IUA
1 (*)	AA1WV	KE1LY	(***)	KB1FPG
2 (*)	AB2RE	KG2RM	(***)	KC2GWG
3 (*)	AA3VS	KF3DZ	(***)	KB3FKZ
4 (*)	AG4CE	KV4FH	(***)	KG4JHZ
5 (*)	AD5AB	KM5XF	(***)	KD5LNA
6 (*)	AD6SL	KR6ER	(***)	KG6DAP
7 (*)	AC7JC	KK7WM	(***)	KD7KHC
8 (*)	AB8IR	KI8JX	(***)	KC8PIL
9 (*)	AB9AC	KG9RA	(***)	KB9WYG
N. Mariana	NH0Z	AH0BB	KH0KH	WH0ABP
Guam	(**)	AH2DN	KH2UZ	WH2ANX
Hawaii	(**)	AH6QO	(***)	WH6DGJ
Am.Samoa	AH8T	AH8AI	KH8DO	WH8ABF
Alaska	(**)	AL7RR	KL0YH	WL7CVE
Virgin Isl.	(**)	KP2CP	NP2LE	WP2AIN
Puerto Rico	WP3H	KP3BL	WP3HT	WP4NOT

\* = All 1-by-2 & 2-by-1 call signs have been assigned.

\*\* = All 2-by-1 call signs have been assigned.

\*\*\* = Group "C" (N-by-3) call signs have now run out in all call sign districts.

**Note:** New prefix numerals now being assigned in Puerto Rico (KP3/NP3/WP3), Hawaii (AH7/KH7) and Alaska (AL0/KL0)

[Source: FCC Amateur Service Database, Washington, DC]

## PRIOR YEAR AMATEUR SERVICE CENSUS

Sep. 1999 to Aug. 2000 — By Month and License Class

Month	EXT	ADV	GEN	T+	TECH	NOV	Total
Sep	75207	103512	110518	133480	199714	53510	<b>675941</b>
Oct	75252	103447	110488	133368	200554	53078	<b>676187</b>
Nov	75293	103455	110406	133378	201415	52819	<b>676766</b>
Dec	75392	103471	110386	133359	202409	52375	<b>677392</b>
Jan	75428	103360	110201	133153	202814	51762	<b>676718</b>
Feb	75609	103215	110047	133220	203492	51263	<b>676846</b>
Mar	<u>75985</u>	<u>103048</u>	<u>109787</u>	<u>133688</u>	<u>204646</u>	<u>50630</u>	<b>677884</b>
Apr	77530	101725	111337	132013	205857	50077	<b>678539</b>
May	83104	96759	117903	123921	206646	49016	<b>677349</b>
Jun	90451	90837	128652	112054	208838	48441	<b>679273</b>
Jul	91143	90320	129791	109739	210103	47839	<b>678935</b>
Aug	93277	90779	131830	108431	212140	47585	<b>684042</b>

## FCC CREATES NEW VHF-CB SERVICE

MURS Service Virtually Unknown

The "Multi-Use Radio Service" (MURS) is the latest Citizens Band Radio Service. With a respectable 2 W maximum effective radiated power (ERP) and very few regulations, we expect MURS to be used for general CB, phone patch, packet, paging, image, repeater, telemetry and remote control operation.

Continuous transmission is permitted when MURS is used for remote control purposes, on four of the five channels. No MURS license is issued and no station identification is necessary.

MURS has received virtually no publicity from the FCC or from hobby or commercial trade publications. FCC Commissioners usually issue celebratory statements when they create new services, but they have been silent on MURS.

As an unlicensed service, we expect little or no FCC enforcement in MURS. We draw this conclusion from the peculiar history of this service.

The FCC created MURS on July 12, 2000 (Wireless Telecommunications Docket 98-182). Final MURS rules have not yet been published in the Federal Register, but that could happen by the end of September. Rumors are that this service could become available in October.

MURS began as an FCC reaction to rampant unlicensed operation on certain Industrial/Business Pool radio frequencies. These frequencies are informally known as "color dots," named after colored stickers identifying the channel.

(By way of explanation, the former Business Radio Service, and many other industrial services, are now "pooled" together in the "Industrial/Business Pool" of frequencies in Part 90 of the Rules.)

Color dot radios are pretuned, off-the-shelf business radios sold by two-way radio outlets and in national consumer electronics chain stores and hardware stores such as Home Depot. Some color dots are on VHF, others UHF.

"Many advertisements imply that these radios can be used by anybody for any purpose, whether commercial or recreational, and make no mention of the licensing requirement," the FCC has stated. "Manufacturers have informally indicated to us that it is their belief that only a small percentage of persons buying these radios actually apply for a license."

The FCC proposed to move VHF color dot frequencies to CB by creating a new class of Citizens Band Service.

Radio Shack -- popularizer of another CB service, the Family Radio Service (FRS) in the UHF spectrum -- strongly supported the idea. Such a new service could "offer the general public the utility of features and



accessories not currently available in the Family Radio Service," the company said.

Radio Shack and Motorola asked the FCC to add frequencies in the UHF band to the new service. But trade associations for the wireless industry asked that "other frequencies in the Industrial/Business Pool not become a haven in which manufacturers are allowed to promote unlicensed consumer radios." The "further erosion of critical Private Land Mobile Radio spectrum must be avoided in the future," they said.

"Against this backdrop," the FCC said, "we are not persuaded that there is sufficient support in the record to justify reallocation of additional Part 90 frequencies at this time. We may, however, revisit this issue at a later date should additional support develop. We will therefore include in the new Multi-Use Radio Service only the five frequencies listed in our original proposal."

MURS Channels	Authorized Bandwidth
151.820 MHz	11.25 kHz
151.880 MHz	11.25 kHz
151.940 MHz	11.25 kHz
154.570 MHz	12.5 kHz
154.600 MHz	12.5 kHz

The FCC officially defined MURS as "a private, two-way, short-distance voice, data or image communications service for personal or business activities of the general public." [FCC Rule 95.401(e)]

It permitted 2 W operation on all MURS frequencies, including those formerly limited to 1 W, for "consistency and ease of use and administration," the FCC said.

There are key differences between FRS and MURS. Data transmission, except for certain signals to establish voice QSO, is prohibited in FRS but permitted in MURS.

FRS is UHF (462/467 MHz) while MURS is VHF, with attendant benefits to MURS signal propagation. Unlike FRS, external, detachable antennas are allowed in MURS.

### What rules don't say

"The significance of the rules governing the Multi-Use Radio Service is not in what they say, but in what they don't say," according to Corwin D. Moore Jr., WB8UPM, coordinator of the Personal Radio Steering Group (See: <http://www.provide.net/~prsg>.)

He observed that MURS does not restrain content of communications or station operator eligibility (other than the usual exclusions related to foreign governments). The rules will now permit what the FCC used to prohibit: unlimited personal communications on frequencies that used to be for business use only.

"MURS has no restriction on connecting to external

antennas, nor on antenna height, so long as the 2 W ERP restriction is observed. Two watts at an even modest height could produce great coverage," he said.

"There is no constraint on communications with other radio services, or with retransmitting signals from other MURS (or other) radio stations. How soon will we see repeaters? There is no restriction on interconnection with the Public Switched Telephone Network."

Moore said that the FCC may have created a "completely unmanageable monster" in MURS.

### Other New CB Services

MURS is not the only new CB service. Here is the complete list of current Personal Radio Services:

#### **SUBPART PART 95 RULE SUBPART**

Subpart A	General Mobile Radio Service (GMRS)
Subpart B	Family Radio Service (FRS)
Subpart C	Radio Control Radio Service
Subpart D	Citizens Band Radio Service
Subpart G	Low Power Radio Service (LPRS)
Subpart H	Wireless Medical Telemetry Service
Subpart I	Medical Implants Communication Service
Subpart J	Multi-Use Radio Service (MURS)

You may be unfamiliar with some of the newer services. The Low Power Radio Service is intended for various non-voice purposes, including headset devices used in schools for the hearing impaired.

LPRS also is used to control certain types of maritime stations, and may be used for health care applications. LPRS is perhaps best known for its intended use in "beacon bucks," theft tracking transmitters hidden inside stacks of money.

The Wireless Medical Telemetry Service is used to transmit signals to patient monitoring devices. The Medical Implants Communication Service conveys signals between devices such as pacemakers and their programming devices, replacing the bulky inductive pickups formerly used.

Although these unlicensed services have nothing to do with the 27 MHz Citizens Band, the FCC finds it convenient to place them within the CB scope. The Communications Act normally requires licenses for all stations, but it exempts anything that the FCC wishes to call CB.

The General Mobile Radio Service is an exception. While GMRS rules are listed under Part 95, it is a licensed service. You must have an FCC-authorized GMRS license (or be an eligible station operator under someone else's existing GMRS license), or be authorized to operate under a "temporary call sign," before you may legally transmit with a GMRS radio.