



PARKING TICKET

Plano, Texas

"Having fun with Amateur Radio!"

January, 2000

Amateur Restructuring is Here

Three License Classes, One Code Speed

NEWINGTON, CT, Dec 30, 1999—Amateur Radio will get a new look in the new millennium. The FCC today issued its long-awaited Report and Order in the 1998 Biennial Regulatory Review of Part 97—more commonly known as “license restructuring.” The bottom line is that starting April 15, 2000, there will be three license classes—Technician, General, and Amateur Extra—and a single Morse code requirement—5 WPM.

“We believe that an individual’s ability to demonstrate increased Morse code proficiency is not necessarily indicative of that individual’s ability to contribute to the advancement of the radio art,” the FCC said.

Besides drastically streamlining the Amateur Radio licensing process, the FCC said its actions would “eliminate unnecessary requirements that may discourage or limit individuals from becoming trained operators, technicians, and electronic experts.”

Although no new Novice and Advanced licenses will be issued after the effective date of the Report and Order, the FCC does not plan to automatically upgrade any existing license privileges. The ARRL had proposed a one-time across-the-board upgrading of current Novice and Tech Plus licensees to General class, but the FCC declined to adopt the idea. This means that current licensees will retain their current operating privileges, including access to various modes and subbands, and will be able to renew their licenses indefinitely.

Starting April 15, 2000, indi-

viduals who qualified for the Technician class license prior to March 21, 1987, will be able to upgrade to General class by providing documentary proof to a Volunteer Examiner Coordinator, paying an application fee, and completing FCC Form 605.

The FCC’s decision not to automatically upgrade Novice and Tech Plus licensees means the current Novice/Tech Plus HF subbands will remain and not be “refarmed” to higher class licensees as the ARRL had proposed. The FCC said it did not refarm these subbands because there was “no consensus” within the amateur community as to what to do with them.

As it had proposed earlier, the FCC decided to lump Technician and Tech Plus licensees into a single licensee database, all designated as “Technician” licensees. Those who can document having passed the 5 WPM Morse code examination will continue to have the current Tech Plus HF privileges. “If documentation is needed to verify whether a licensee has passed a telegraphy examination, we may request the documentation from that licensee or the VECs,” the FCC said.

In addition to reducing the number of license classes from six to three and eliminating the 20 and 13 WPM code tests, the FCC also will reduce the number of written examination elements from five to three, authorize Advanced Class hams to prepare and administer General class examinations, and eliminate Radio Amateur Civil

Emergency Service (RACES) station licenses. RACES will remain, however. “After review of the record, we conclude that we should eliminate RACES station licenses because RACES station licenses are unnecessary for amateur stations and amateur service licenses to provide emergency communications,” the FCC said.

Under the new licensing scheme, there will be four examination elements. Element 1 will be the 5 WPM Morse code exam. Element 2 will be a 35-question written test to obtain a Technician license; Element 3 will be a 35-question written test to obtain a General license, and Element 4 will be a 50-question written test for the Amateur Extra

Continued on page 2

The following dates are the Plano Amateur Radio Klub meetings for the year 2000.

@ Harrington Library
Jan. 1-10-00 (Mon.)
Feb. 2-07-00 (Mon.)
Mar. 3-06-00 (Mon.)
Apr. 4-18-00 (Tue.)
May 5-08-00 (Mon.)
June 6-12-00 (Mon.)
July 7-18-00 (Tue.)
Aug. 8-15-00 (Tue.)
Sept. 9-11-00 (Mon.)
Oct. 10-09-00 (Mon.)
Nov. 11-21-00 (Tue.)
Dec. 12-19-00 (Tue.)

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license. The FCC has left it in the hands of the National Conference of VECs Question Pool Committee to determine the specific mix and makeup of written examination questions. Current Amateur Radio study materials remain valid at least until the new rules become effective in April.

The FCC's new licensing plan means someone will be able to become a ham by passing a single 35-question written examination. The plan also simplifies and shortens the upgrade path from the ground floor through Amateur Extra—especially since amateurs will only have to pass one Morse code test.

Elimination of the 13 and 20 WPM Morse requirements also means an end to physician certification waivers for applicants claiming an inability to pass the Morse code examination due to physical handicap.

The effective date provides a window of upgrade opportunity for current Advanced licensees. Between now and April 15, current Advanced holders may take the existing Element 4B, a 40-question test, giving them credit for having passed the current Extra written examination. Likewise, holders of a Certificate of Successful Completion of Examination (CSCE) for Elements 3B or 4B dated on or after April 17, 1999, will be able to qualify for General or Amateur Extra respectively when the new rules go into effect on April 15, 2000.

The FCC disagreed with the League's suggestion that it undertake a restructuring of operating privileges along with licensing restructuring. "We believe that in light of ongoing discussions concerning implementation of new and more modern communications technologies within the amateur service community, we should accord the amateur service community an opportunity to complete such discussions and possibly reach

a consensus regarding implementation of new technologies before we undertake a comprehensive restructuring of the amateur service operating privileges and frequencies," the FCC said in its Report and Order.

In its amendments to Part 97, the FCC's Report and Order refers to a "Club Station Call Sign Administrator," something that does not exist under the current rules and which was not explained in the R&O itself. An FCC spokesperson said the Commission plans to issue a Public Notice soon to explain the program and to solicit qualified entities to serve as call sign administrators for club station applications.

A copy of the entire Report and Order (FCC 99-412) is available at <http://www.arrl.org/announce/regulatory/wt98-143ro.pdf> or at http://www.fcc.gov/Daily_Releases/Daily_Business/1999/db991230/fcc99412.txt.

Report courtesy ARRL Letter

New Repeater (& new freq)

The Van Alstyne Radio Club is pleased to announce that the UHF repeater is now fully installed and operational on 443.800 (+5) MHz with subaudible tone 103.5 Hz.

Call sign on the repeater is the club call, W5VAL/R

The duplexer has also been installed, so the range will be much better than the test system used the past few weeks.

Please note that the final frequency is different from the one initially authorized by the Texas VHF-FM Society; this is the official frequency pair now.

Mike, W8CM

Greetings fellow 21st Centurions!

With the drop of a ball, the lighting of a horse, and the whimper of a Y2K we have ushered in a new century. Where will this next 100 years take amateur radio? To an extent, it will be where we want to take it. The same is true of our club. If we choose to make a place where everyone is welcome, friendly, and a place we can look forward to meeting each month, then we will grow and prosper. If we choose to sit back and let only a few run the club, make decisions, then we will start a slow decline into oblivion. It is our choice. Your choice!

A JOB WELL DONE! To all who helped out with the City, and County Y2K extravaganza. Another step closer to showing that amateur radio does have a place within the structure of emergency communications in Collin County.

The annual Christmas party was fun as usual. Lots of good food, door prizes, new members, and lots of fellowship. We have seen larger crowds in previous meetings. But like they say, that much more for us to enjoy.

Make sure that you keep a good watch on the newsletter calendar. Half of the meetings will be on Monday's this year and the other half will be on Tuesday's. Always at the Harrington Library at 7:30pm.

Hope to see you ALL at the January meeting.

Bill AAR6CE/ KJ5ZV

PS, Don't forget that the 2000 dues are due in January, with the cut off date of the March meeting.

DUES ARE DUE!

December P.A.R.K. Meeting in Pictures



Hams are OK people!



Callsign Sweatshirt - N(zero)EL



W8EHS - Newsletter, N5CAE - Public Relations, K5YO - Secretary



Yep! One size fits all...



"At Midnight I want you to..."



I'm dreaming of a white Christmas.



You have any more peanuts?



Let's sing "Jingle Bells"!

Easily Heard Signals

de W8EHS

w8ehs@arrl.net

Since you are reading this, the millennium bug has passed and we are still resident on this planet. The last time I checked the sun was still coming up in the morning. It is New Years Eve as I begin writing. The news people on TV are falling all over themselves

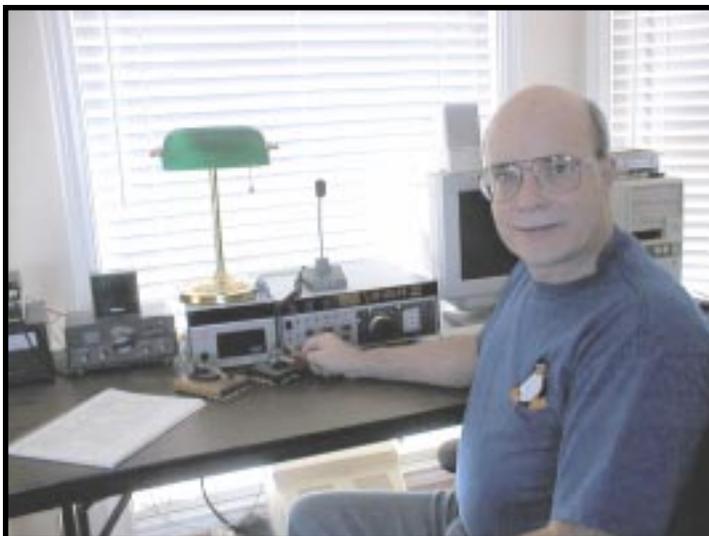
trying to invent something about the bug. They seemed to be primed to show the last gasps of computerized civilization. Nothing turns them folks on like a big disaster or a political scandal.

I have decided to join the ranks of five-land. I got on line with the FCC and completed the paperwork. Er... computer work for another call sign change. I requested W5EHS with alternates of N5EHS and K5EHS. Yeah, it's a nasty CW call but what the hey... they may nickname me machine gun Kautz!

The on line experience was a real challenge. The FCC apparently doesn't like normal Internet connection. Yes, I could get to their site with my normal connection (@home cable modem) but I couldn't find how to get to form 605 for the vanity update. It wasn't there!

After reading a bunch of fine print I discovered I would have to dial an 800 number and log in via phone modem (at 28Kbs) rather than the 1.5Mbs cable connection. I had to configure a new special dial up with a special domain name server IP.

Once I got in, I discovered the only browser that would work with the site was Netscape. So I had to back out of IE 5.0 and fire up Netscape. Once I logged in again, the site up-loaded some sort of upgrade into Netscape using a java



script. I suppose that is why it had to be Netscape not IE 5.0. Talk about government paranoia! But finally, the button required to get to the forms appeared. But... I had to register with the system as a user. Furnish my taxpayer ID (SS Number) and give away certain other rights. At last I got to the place where I could put data into the form.

The first form I used was to change the call sign. It was so flaky it crashed about a half dozen times. Finally I changed to the form that would change my call AND extend the registration to a full ten years. All went well with that form. Then came time to pay.

Another form is required for payment (\$1.40/year or actually \$14.00). I think it was form 149. A nice thing is that you can pay on line with a credit card. Or so they claim. But they inform you that it will only work with 128-bit encryption. So NOW they tell me! I don't know if my Netscape is 128 or not. In any case, it won't take my credit card. It just locked up again. C**p! I just printed the form and mailed it in. Oh, and watch out. Don't mail your money to Gettysburg. It goes to Pittsburgh.

If you make it through this system, you deserve a new call!

I am glad my experience was the end of the 1999-year and not the

start of 2000. So far 2000 is off to a good start for amateur radio. Check out the lead article in this issue. Restructuring has finally been decided. Looks pretty good to me. I will certainly go take the written for extra. Advanced doesn't actually go away but no new tests will be given for that class. It all takes effect on April 15th (Tax day?). Hmmm...

I'll keep playing with CW but digital is where it will be. Yeah, CW is digital sort of... but you know what I mean. My problem is that there is just not enough

time to try everything out there I would like to do. Even if I weren't working, there wouldn't be enough time. That seems to be the disease of the 20th err... 21st century. So much to do and so little time. What happened to "all that free time" that modern inventions were supposed to provide to the US citizens?

The problem is we have and want so much more. If our wants and needs stayed the same as they were 50 years ago, we would have plenty of time. But that is not the way life works. The more we have the more we want. What we want cost so much more that we have to use the free time to be productive and earn more. Then it goes on and on.

Jump back 50 years with what we have and now know and we would all look like millionaires!

Maybe work one day a week. Play ham radio all the rest of the week. NOT! Our radios would have them light-up tube things in them. No 2M-FM! What's a computer? Whoa!

We ARE in the good times. Lets enjoy whatever we get. Here's hoping you have a great New Year Millennium! No bugs.

P.A.R.K. Meeting Minutes

December 21, 1999

The regularly scheduled meeting of the Plano Amateur Radio Club was called to order by Bill Drake KJ5ZV, PARK president. The meeting/party was attended by 15 members and 10 visitors and spouses.

Bill Swan K5MWC, our District Emergency Coordinator gave an update on Y2K plans. The intent is to staff the EOC at Plano, Allen, Collin County in McKinney and have a net member at each of the fire stations in Plano and Allen. A formal net will be held from 9:30 to 2am. A total of 30 volunteers are needed. More volunteers still need to sign up. Coordinators are WD5ERD and N5BYL for city of Plano, Bill Fell for Collin County, Wayne WB5TX for city of Allen and Shel N5CAE for Plano Medical Center.

The normal meeting agenda was postponed in favor of the Christmas party. Everyone had a great time and enjoyed the beautiful red covered table with a spread of heavenly desserts. Several members were lucky enough to win door prizes. The prizes included a couple of ARRL Repeater Directories, an ARRL Operating Manual, an ARRL Handbook and two bottles of festive spirits. Shel N5CAE and his wife Blanche won the two top prizes - The ARRL Handbook and Operating Manual.

The party was interrupted briefly to approve the new applications of Lester Woosley, W5EIJ; Rick Mathews, KC5AYK; and James Barth, KD5IQF.

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FUNDAMENTALS OF LIGHTNING PROTECTION

by Richard Kithil/ President/ CEO

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Introduction.

Lightning is a capricious, random and unpredictable event. Its' physical characteristics include current levels sometimes in excess of 400 kA, temperatures to 50,000 degrees F., and speeds approaching one third the speed of light. Globally, some 2000 on-going thunderstorms cause about 100 lightning strikes to earth each second. USA insurance company information shows one homeowner's damage claim for every 57 lightning strikes. Data about commercial, government, and industrial lightning-caused losses is not available. Annually in the USA lightning causes more than 26,000 fires with damage to property (NLSI estimates) in excess of \$5-6 billion.

The phenomenology of lightning strikes to earth, as presently understood, follows an approximate behavior:

1. The downward Leaders from a thundercloud pulse towards earth seeking out active electrical ground targets.

2. Ground-based objects (fences, trees, blades of grass, corners of buildings, people, lightning rods, etc., etc.) emit varying degrees of electric activity during this event. Upward Streamers are launched from some of these objects. A few tens of meters off the ground, a "collection zone" is established according to the

intensified local electrical field.

3. Some Leader(s) likely will connect with some Streamer(s). Then, the "switch" is closed and the current flows. We see lightning.

Lightning effects can be direct and/or indirect. Direct effects are from resistive (ohmic) heating, arcing and burning. Indirect effects are more probable. They include capacitive, inductive and magnetic behavior. Lightning "prevention" or "protection" (in an absolute sense) is impossible. A diminution of its consequences, together with incremental safety improvements, can be obtained by the use of a holistic or systematic hazard mitigation approach, described below in generic terms.

Lightning Rods.

In Franklin's day, lightning rods conducted current away from buildings to earth. Lightning rods, now known as air terminals, are believed to send Streamers upward at varying distances and times according to shape, height and other factors. Different designs of air terminals may be employed according to different protection requirements. For example, the utility industry prefers overhead shielding wires for electrical substations. In some cases, no use whatsoever of air terminals is appropriate (example: munitions bunkers). Air terminals do not provide for safety to modern electronics within structures.

Air terminal design may alter Streamer behavior. In equivalent e-fields, a blunt pointed rod is seen to behave differently than a sharp pointed rod. Faraday Cage and overhead shield designs produce yet other effects. Air terminal design and performance is a controversial and unresolved issue. Commercial claims of the "elimination" of lightning deserve a skeptical reception. Further research and testing is on-going in order to understand more fully the behavior of various

air terminals.

Downconductors, Bonding and Shielding.

Downconductors should be installed in a safe manner through a known route, outside of the structure. They should not be painted, since this will increase impedance. Gradual bends (min. eight inch radius) should be adopted to avoid flashover problems. Building steel may be used in place of downconductors where practical as a beneficial part of the earth electrode subsystem.

Bonding assures that all metal masses are at the same electrical potential. All metallic conductors entering structures (AC power, gas and water pipes, signal lines, HVAC ducting, conduits, railroad tracks, overhead bridge cranes, etc.) should be integrated electrically to the earth electrode subsystem. Connector bonding should be thermal, not mechanical. Mechanical bonds are subject to corrosion and physical damage. Frequent inspection and ohmic resistance measuring of compression and mechanical connectors is recommended.

Shielding is an additional line of defense against induced effects. It prevents the higher frequency electromagnetic noise from interfering with the desired signal. It is accomplished by isolation of the signal wires from the source of noise.

Grounding.

The grounding system must address low earth impedance as well as low resistance. A spectral study of lightning's typical impulse reveals both a high and a low frequency content. The high frequency is associated with an extremely fast rising "front" on the order of 10 microseconds to peak current. The lower frequency component resides in the long, high energy "tail" or follow-on current in the impulse. The grounding system appears to the lightning impulse as a transmission line where wave propagation theory applies.

A single point grounding system

is achieved when all equipment within the structure(s) are connected to a master bus bar which in turn is bonded to the external grounding system at one point only. Earth loops and differential rise times must be avoided. The grounding system should be designed to reduce ac impedance and dc resistance. The shape and dimension of the earth termination system is more important a specific value of the earth electrode. The use of counterpoise or "crow's foot" radial techniques can lower impedance as they allow lightning energy to diverge as each buried conductor shares voltage gradients. Ground rings around structures are useful. They should be connected to the facility ground. Exothermic (welded) connectors are recommended in all circumstances.

Cathodic reactance should be considered during the site analysis phase. Man-made earth additives and backfills are useful in difficult soils circumstances: they should be considered on a case-by-case basis where lowering grounding impedances are difficult and/or expensive by traditional means. Regular physical inspections and testing should be a part of an established preventive maintenance program.

Transients and Surges.

Ordinary fuses and circuit breakers are not capable of dealing with lightning-induced transients. Lightning protection equipment may shunt current, block energy from traveling down the wire, filter certain frequencies, clamp voltage levels, or perform a combination of these tasks. Voltage clamping devices capable of handling extremely high amperages of the surge, as well as reducing the extremely fast rising edge (dv/dt and di/dt) of the transient are recommended. Adopting a fortress defense against surges is prudent: protect the main panel (AC power) entry; protect all relevant secondary distribution panels; protect all valuable plug-in devices such as process control instrumentation,

computers, printers, fire alarms, data recording & SCADA equipment, etc. Further, protect incoming and outgoing data and signal lines. Protect electric devices which serve the primary asset such as well heads, remote security alarms, CCTV cameras, high mast lighting, etc. HVAC vents which penetrate one structure from another should not be ignored as possible troublesome electrical pathways.

Surge suppressors should be installed with minimum lead lengths to their respective panels. Under fast rise time conditions, cable inductance becomes important and high transient voltages can be developed across long leads.

In all instances, use high quality, high speed, self-diagnosing protective components. Transient limiting devices may use a combination of arc gap diverters-metal oxide varistor-silicon avalanche diode technologies. Hybrid devices, using a combination of these technologies, are preferred. Know your clamping voltage requirements. Confirm that your vendor's products have been tested to rigid ANSI/IEEE/ISO9000 test standards. Avoid low-priced, bargain products which proliferate the market (*caveat emptor*).

Detection.

Lightning detectors, available at differing costs and technologies, sometimes are useful to provide early warning. An interesting application is when they are used to disconnect from AC line power and to engage standby power, before the arrival of lightning. Users should beware of over-confidence in such equipment which is not perfect and does not always acquire all lightning data.

Education.

Lightning safety should be practiced by all people during thunderstorms. Preparedness includes: get indoors or in a car; avoid water and all metal objects; get off the high ground; avoid solitary trees; stay off the telephone. If caught outdoors during nearby lightning, adopt the Lightning

Safety Position (LSP). LSP means staying away from other people, taking off all metal objects, crouching with feet together, head bowed, and placing hands on ears to reduce acoustic shock.

Measuring lightning's distance is easy. Use the "Flash/Bang" (F/B) technique. For every count of five from the time of seeing the lightning stroke to hearing the associated thunder, lightning is one mile away. A F/B of 10 = 2 miles; a F/B of 20 = 4 miles, etc. Since the distance from Strike A to Strike B to Strike C can be as much as 5-8 miles. Be conservative and suspend activities when you first hear thunder, if possible. Do not resume outdoor activities until 20 minutes has past from the last observable thunder or lightning.

Organizations should adopt a Lightning Safety Policy and integrate it into their overall safety plan.

Testing.

Modern diagnostic testing is available to mimic the performance of lightning conducting devices as well as to indicate the general route of lightning through structures. This testing typically is low power, 50 watt or less. It is traceable, but will not trip MOVs, gas tube arrestors, or other transient protection devices. Knowing the behavior of an event prior to occurrence is every businessman's earnest hope. With such techniques, lightning paths can be forecast reliably.

Codes & Standards.

The marketplace abounds with exaggerated claims of product perfection. Frequently referenced codes and installation standards are incomplete, out dated and promulgated by commercial interests. On the other hand IEC, IEEE, MIL-STD, FAA, NASA and similar documents are supported by background engineering, the peer-review process, and are technical in nature.

Summary.

It is important that all of the above subjects be considered in a

lightning safety analysis. There is no Utopia in lightning protection. Lightning may ignore every defense man can conceive. A systematic hazard mitigation approach to lightning safety is a prudent course of action.

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Phase 3D Awaits Paperwork Clearance

December 27, 1999

As the Phase 3D team deals with the red tape required to ship the next-generation Amateur Radio satellite to the launch pad, AMSAT-NA President Keith Baker, KB1SF, says team members are making good use of the time.

"Right now, P3-D is still in Orlando, the satellite team has been busy getting the last-minute paperwork clearances and shipping details in order for shipment to the launch site at Kourou in French Guiana," he said this week. Baker said the team was waiting for various US government agencies to issue final, updated versions of the necessary paperwork and clearance documents. The documents contain shipping information, specific equipment lists, shipment contents, final weight and customs documentation needed to allow the international shipping contractor to actually schedule and then ship not only the P3D spacecraft, but also the SBS (space frame) and several pieces of associated ground equipment via commercial airliner to Kourou.

"AMSAT has been assured that all clearances are forthcoming, and we are simply waiting for all the paperwork to clear," Baker said.

During the wait, the P3D team has been using the time for last-minute tweaking on spin balancing of the spacecraft. "Right now," Baker said, "all is in readiness and our plan right now is to have P3D on the plane to Kourou as soon as possible."

A launch contract accepting Phase 3D as a payload for the first suitable Arianespace Ariane 5 vehicle launch was signed October 5. Phase 3D would be among the first Ariane 5 secondary payloads. A special adapter will be required to inject Phase 3D into the proper orbit.

Phase 3D, which weighs 1,430 pounds, will be injected into a geostationary transfer orbit. It then will use its own propulsion system to reach an elliptical orbit around Earth.—AMSAT News Service

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The **PARKING TICKET** is the monthly publication of the Plano Amateur Radio Klub (PARK) and is intended to present news, issues and opinions of interest to the PARK and the Amateur Radio Community. We encourage contribution of articles, letters to the editor, etc. and welcome newsletter exchanges with other clubs around the country. Permission is granted to reprint material as long as proper credit is given. Ideas for and contributions to the **PARKING TICKET** should be sent to:

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Submissions must be received no later than the first day of the month to be included in that month's issue. Material received after the deadline will be included in the following month's issue if it is still current.

The Plano Amateur Radio Klub meets each month at 7:30 PM in the Harrington Library, 18th and Avenue P. See newsletter, web page or listen to repeaters for date. Dues are \$15 per year, \$21 for family membership, and \$7 for the Repeater Association, prorated biannually. The PARK operates three repeaters: WD5ERD on 147.18+, WB5SGN on 224.22- and K5VOU on 444.25+. Look for PARK on the Internet at: <http://www.holman.net/park/>.



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