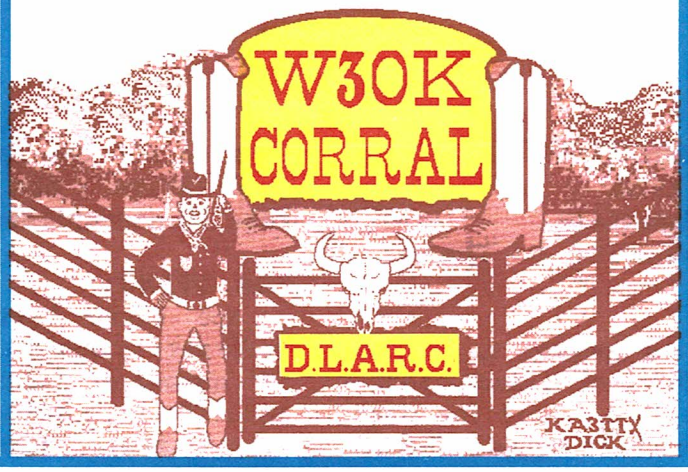
DELAWARE-LEHIGH AMATEUR RADIO CLUB, INC. W3OK

March 1991



SPECIAL SERVICE CLUB
ARRL Affiliated Club

THOMAS EDISON -LOCAL BOY WHO MADE GOOD

THE STORY OF THOMAS EDISON

by Bill, K3ANS

While Edison was working out the principles behind the telegraph and the telephone, he came upon the experiment that opened the door to the discovery of recording of sound. From this came the phonograph and microphone. it was the result of much more than this -- it was the cumulative knowledge and genius of Thomas A. Edison who discovered a new principle, out of which the talking picture was developed and the radio age came into existence. It was at the time Edison was making his first discoveries in sound waves, to which he gave the name "Etheric Force" in 1875 - 76.

Because the force appeared unaffected by contact with the earth, Edison foresaw the possibility of doing away with poles and insulators in telegraphic transmission. A decade later it became evident that observations of the mysterious etheric force marked a step toward discovery of electromagnetic waves. This permitted Marconi to advance development of the radio.

Edison Industries in later years purchase the Splitdorf Company for the radio rights. Locally a facility of the new Edison-Splitdorf Company manufactured spark plugs in Hellertown. (Later we know that Champion Spark Plug was located there employing DLARC's own KA3QOM.) Radio and automotive parts were manufactured in a New Jersey facility. Alpha Portland Cement of Easton was an outgrowth of Edison Cement and quarries in Alpha NJ.

Carl Brown a retired plant manager from Victaulic Industries has made a life study of Edison; he will be the speaker at the March 7, 1991 meeting of DLARC. Come early. Carl will display old phonographs, recording drums, microphones, tubes, etc.

NOVICE-TECHNICIAN CLASSES TO START

by Robin, WA3T

A series of twelve classes intended to prepare aspiring hams for the Novice and Technician license tests will start on Monday March 4th. They will be held at Gracedale, from 7pm until 9pm.

The course will include an integrated review of all the material required to pass both the Novice and Technician written tests. We will also provide Morse code practice and review aimed at the 5wpm code test.

Those who want to make the new codeless Technician license their first step into ham radio are welcome to join the class. They will have to listen to some code practice, maybe they will find that 5wpm code isn't so hard after all! Novice written and code tests will be offered during the classes. The Technician test must, of course, be taken at a VE test session.

There is no fee for the classes: we recommend the ARRL "Tuning In the World" and "Technician License Manual" as study guides, and will have some available for sale at cost. Club members should feel free to call any of the leaders, K3EX, NU3L or WA3T if they have questions. We prefer that aspiring hams or others who have questions call the club mailbox at 820-9110, leave their name, telephone number and full mailing address, and ask for an information packet (or ask their question); we will respond promptly.

******* *SEE RELATED STORY ON PAGE 6*******

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Information received from ARRL indicates that we have again received the commendation and recognition that indicates that we are again an **ARRL SPECIAL SERVICE CLUB.**

DIGITAL COMMUNICATIONS

by Joel K9TBD

Packet Fundamentals

How do they get from Here to There?

THE TEASE:

Did you ever take apart a speaker to see how it worked? How about a "Big Ben" windup clock? Just to see what made it tick? Did you ever take apart a packet to see how it works? Clocks and speakers may be easier to understand using conventional tools but packets may be examined using a different set of tools for disassembly.

Don't fret yet. This article will describe the fundamentals - not the overwhelming details.

THE SETUP:

Initially Digital Communications sent the 'raw' information only. Morse code (one of the first but not the first) sent a signal or no-signal. Information was conveyed by the timing of the presence or absence of a signal. If there were no change, there is no information. Think about that last statement! NO SIGNAL - NO INFORMATION; KEY DOWN (All signal) - NO INFORMATION!

If you haven't been exposed to that last thought think about it for a while. What is information? The conclusion you may come up with is the more random these conditions of signal and no signal are: the more information they contain.

What would happen if you missed (bad receiver QRM QRN etc.) one of these signal conditions of ON and OFF keying? Well you would miss some information.

How do you correct the fact that a piece of the correspondence (transmitter to receiver) is lost? One technique is to send the message twice. If both messages are the same then conclude that you received the message correctly. If they are different = which is correct? Why not send the message three times then take a majority vote? Two out of three vote would be reasonable. It can go on and on. You get the point.

The 'raw' information (in QRM QRN) needs something to help detect errors. In the above example if you send the message twice you have a chance to detect an error. If you send the message three times not only is there a chance to detect an error but there is a possibility to correct the error. But the catch is: if you send the message twice it takes twice as long to say the same thing. If you do the same thrice - one third of the information rate is accomplished.

THE STING:

Are there better methods for sending information other than repeating the messages 'N' number of times? There are! One simple and effective method (accountants have used this in their ledger sheets for years) is to make up a check sum. A bunch of characters sent from a transmitter to a receiver may be thought of as a bunch of numbers. Why not (starting at the senders end) add up all the characters in a bunch - a packet send the bunch (packet) and follow it with the check sum? As the receiver gets the characters (numbers) it adds them up and when the final character (the check-sum) is received the receiving station compares this with the checksum that the transmitting station sent as the last character. If they are the same the receiver presumes that the message was received properly. If the received check sum and the locally computed checksum differ then and only then a retransmission is requested.

If the errors are sparse this scheme of a check-sum error detection is better than always sending the message twice thrice etc.. For example suppose there is an error only once in every 10 packets - then 11 packets must be sent to assure correct reception however if you send each packet (message) twice you only get 10 information packets for every 20 packets sent!

This is how packet radio controls errors! Every packet (usually 128 characters - a line or so) are sent at a time with a check sum following the last of the information. If all goes well there is no request for a retransmission.

In addition to this additional 'information - the check-sum' the source and destination addresses (Call Signs) for each packet must be included. Also identification of what kind of packet must be sent - this all adds up to the 'overhead' beyond the data (information) content. The addresses are needed because many people share the same channel at the same time and "who's packet is that" must be resolved.

(continued on Page 6)

HOW TO USE AN OSCILLOSCOPE
(Part 3)
By Van, K3CP

Elmer and Ima Lidd are discussing oscilloscopes. They have covered how they work and now Elmer believes that Ima is ready to put his knowledge to some practical use.

"Ima," Elmer said, "Have you ever heard of the phase of signals and their being in phase or out of phase?"

"Yes, I have," replied Ima, "but I never understood what that meant."

"It's not very difficult if we understand what constitutes a signal. A signal for this purpose (and most others) will consist of a voltage component and a current component. These two components are said to be in phase when they are both doing the same thing at the same time."

"Hold it right there, Elmer," interrupted Ima, "what does that mean in plain language?"

"I'll try to make it as clear as I can," said Elmer. "Let's look at an open circuit. There is no voltage or current present. Now let's complete the circuit and apply a signal. If the current and voltage components start at zero and move in the same direction at the same time they are IN PHASE with each other. They will rise to their maximum amplitude together, then they will decrease to zero together, and then finally change direction and repeat the second half of the cycle.

"Let's look at an example, Ima. An AC voltage of 120 volts is applied to a purely resistive circuit of 60 ohms. On the first quarter (90 degrees) of the AC cycle the voltage rises to 120 volts and the current rises to 2 amps. Notice that the two components are doing the same thing at the same time. Now on the second quarter they both fall to zero at 180 degrees. They now reverse directions, remember this is AC, and build back up to their maximum voltage and current at 270 degrees and then back to their starting values at 360 degrees. Since they have done the same thing at the same time, they are still in phase. Any questions?"

Ima said, "No, I follow that pretty well and admit that understanding phase relationships is not all that difficult. What does this have to do with using an oscilloscope?"

"Well," continued Elmer, "the oscilloscope can be used to measure the phase relationship between the two signals. We would need a 'scope that has two vertical inputs so that it can accommodate two signals at the same time. Remember we just said that the current and the voltage are in phase in a circuit containing resistance only. In some applications, however, we have capacitive and/or inductive reactance present. Then the current will lead the voltage in circuits containing capacitance and it will lag the voltage in inductive circuits. Do you know why this occurs, Ima?"

"Yes, I think I do," replied Ima. "When we discussed capacitors and inductors, you said that capacitors impeded voltage while inductors impeded current."

"Very good," said Elmer. "If the circuit were purely capacitive, the current would lead the voltage by 90 degrees and if it were inductive the current would lag the voltage by 90 degrees. Let's put some real time units into the picture. A 60 cycle per second signal goes through its complete cycle (360 degrees) in 1/60 th of a second. So 90 degrees is 1/4 th of that. If the circuit contained both inductive and capacitive reactance, the phase difference would be less than 90 degrees and leading or lagging would be established by which reactance predominated. The reactance is said to be negative if it is capacitive and positive if it is inductive. The total reactance (X) in a circuit is equal to the inductive reactance (X/L) minus the capacitive reactance (X/C). Do you know what would occur if the capacitive and inductive reactance were equal?"

"Yes, I do," said Ima. "If they were equal they would cancel each other leaving a circuit with no reactance - just resistance. The circuit would be in resonance."

"Wow, you really are learning the theory, Ima," said Elmer. "That's exactly right. Very good. You'll learn as time goes on that all this theory will fall into place and that everything you learn will help you learn more. I think this is a good place to stop for today. In our next session we will discuss some other uses for the oscilloscope. They include calibrating audio oscillators, measuring peak output power of our rigs and many more."

"Sounds interesting. See you then, Elmer, and thanks again."

de Van, K3CP

BIG TURNOUT FOR FEBRUARY VE TESTS

by John, K3GQJ Coordinator

21 Candidates who took a total of 30 Elements at the February 8th testing session at the Northampton County EMA headquarters.

There were 13 upgrades and 1 new Novice. The upgrades are as follows:

Victor J. Celani, KA3YFW Extra
Bruce Shoemaker, N3ISM, Advanced.
John E Knapp, KA2LDX, Advanced.
Joseph Romanoski, KA3VAA, General.
Daniel Yakubisin, KA3OPX, General.
Kenneth E Gruver, KA3YEQ, Technician.
Marc A. Pontician, KA3YIT, Technician.
Bob Wilburn, KA3WJF, Technician
Francine H. Reese, KA3RBI, Technician
John S Wagner, Tech. (No Call yet).
Walter F Tietz, Tech. (No call yet).
Norman W Kichline, Tech. (No call yet).
David C Moyer, New Novice.

The VE Team consisted of Robin Mosely, WA3T; Donald Holmes, KC3II; Archie Lamb, KX5X; Tom Dow, N3EBH; Rick Saeger, K3OO; Roy Buss, KA3MNY; Glenn Block, WA3VHL; Chris Hornaman, NU3L; Charles Nielsen, NE3K; John Greenage, K3GQJ.

The Team 3 will be attending The session on March 8, 1991.

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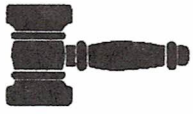
T H E G A V E L S P E A K S

by Ray, W3TDF President DLARC



It certainly is heart warming to see the attendance, now that we have room for all who wish to attend our meetings. Almost a 100 at the Feb.7 session! Outstanding.. The new location at the Northampton County Community College Auditorium is going to work out very well.

After the meeting it was related to me by several people that a number of those present were sitting with their feet up on the back of the seats in front of them. I guess I was too busy with the business at hand to notice it, but you can bet I'll be watching at future meetings, and the offenders will be reminded of their waywardness. If you don't wipe your feet on the furniture at home then don't do it when you're out. We have a lot to be thankful for in our new quarters, and I for one will not allow it to be jeopardized.

We didn't get a final total of raffle tickets sold, but there were sure a lot of stubs in the barrel. By the time you read this I should be back from the deep south, with a nice tan, and hopefully the snow will all be gone. Then we can start planning the garden and field day, and corn, and the picnic.

My thanks and that of all the club members to Brownie, W3CJI for his great job in running the raffle.

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DUMB

reprinted from Ham News Outlet

Recently FBI agents assisted by FCC investigators arrested Anthony V. Marcantonio, KA2ZGC, of Queens, NY. In the process they also sized 20 pieces of his radio transmitting equipment.

FCC investigators had earlier responded to complaints that Marcantonio was "interfering with amateur radio communications by transmitting unidentified, disruptive signals on the two meter band".

Fcc investigators using direction finding equipment, traced the signal to the Marcantonio home, the FCC said. "The investigators discussed the situation with a family member who then shut the transmitter off. The transmission resumed that evening and continued into the next day." It was then, according to the FCC, that Marcantonio made death threats over the radio against an FCC investigator.

Marcantiono was charged with making threats by radio, a felony carrying a penalty of up to five years in prison, a $250,000 fine, or both. A Federal Judge, set Marcantonio's bond at $50,000.

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FOR SALE

Yaseau SP101 Speaker for FT101 Series, $30.00. Paco Model 15 Grid Dip Meter 400Khz to 250Mhz $30.00. Call Jim WA2ZGO @ 908 454-3724.

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JOIN ARRL NOW!

SUPPORT THE ARRL, JOIN AND HELP WITH THEIR ATTEMPTS TO SAVE OUR FREQUENCIES FROM THE COMMERCIAL INTERESTS..*GET YOUR MONEY TO ROY, KA3MNY, 220 E. CHESTNUT ST, NAZARETH. DLARC BENEFITS FROM YOUR MEMBERSHIP THROUGH HIM.*

JUST THE MINUTES

by Dave, N3EYT, Secretary

The February 7th, 1991 meeting of the DLARC was called to order by Ray, W3TDF, at 7:39 p.m. A total of 96 members and friends attended the meeting held on the campus of Northampton County Community College.

The minutes of the January meeting were approved as printed in the W3OK Corral. Roy, KA3MNY, reported a balance as of January 31, 1991 of $5213.06 in the club's checking account. The report was approved as read.

The use of the repeater during a weather alert was discussed. It was recommended that during actual bad weather conditions in the area, Amateurs should try to keep talk to a minimum to facilitate emergency use of the repeater. Choose an alternate frequency/repeater if possible.

The Klondike Derby took place on February 9th at camp Minsi. Club operators provided communication for the annual scouting event. The March of Dimes Walk-a-Thon is scheduled for April 27th and will go from Easton to Bethlehem. Fifteen to 20 operators are needed to provide communication for the event. Contact Amy, KD3TI, if you are interested in helping.

The repeater has been noisy and abused. First, the noise may be in the feedline or tail pieces. We will first replace the tail pieces and wait for a windy day to know if that did the trick. The tail pieces will cost the club about $50. If the problem is the feedline, it will cost approximately $500 to replace. Second, repeater abuse by fowl language and other transgressions of the rules and regulations will not be allowed on the 146.70 repeater. Any club officer or Board of Directors member can shut the repeater down if necessary. If you need help, contact one of the officers or Board members. If immediate help is not available, the repeater has a timer which will shut it down when transmissions exceed 90 seconds. (Be sure to identify).

Repeater Conduct Guide - RCG - is being compiled by Ed, N3HES. Mike, K3NWM, volunteered to help with the guide. The guide is seen as a very necessary tool to assure proper repeater etiquette especially with a no-code license. The DLARC welcomes the following new members: James Monteleone, N2LPX; and David Peischl (14 yrs. old) license pending.

Novice classes will start on March 4, 1991 at the Greystone building in Nazareth between 7-9 p.m. Call the bulletin board at 820-9110 for information on the classes - leave your name and mailing address. The General licensing class started with 20 members and now has 7-10 regulars. Some are ready to take the exam. Robin, WA3T, reminded the club that the no-code license will consist of elements 2 and 3A and is called the Technician class license. The 5wpm code test will give the license holder HF CW privileges as it does today. Awards - Daryl, KA3MND, received an endorsement for DXCC, 250 countries now! Rick, K3OO, also picked-up a 250 country endorsement the hard way - QRP! Congratulations. More than 720 participants mailed in their logs to the Nittany club for the PA QSO Party. Results are still pending - expectations are high.

The annual club raffle results: 1st prize went to Robert Naunel, Jr.; 2nd prize to Chester Zochowski; and 3rd prize to Ken Gruver. Top ticket sellers were: K3ANS with 198 sold; W3TDF with 100; both W3CJI and KA3MOU sold 70; KA3SIT and KA2RTI sold 40 each. Prizes for top ticket sellers included Callbooks, ARRL Handbook and one year paid dues in the DLARC. A very interesting program on desktop publishing and computer graphics was presented by Archie, KX5X.

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DEM BONES, DEM DRY BONES

An organization is made of four kinds of bones. There are Wishbones, who spend all their time wishing somebody else would do all the work. There are the Jawbones, who do all the talking, but very little of everything else. Next comes the Knucklebones, who knock everything that everybody else tries to do. Finally there are the Backbones, who get under the load and do all the work. What kind of member are you?

Why not take an personal inventory? If you are honest with yourself and find your are a Wishbone, Jawbone, or Knucklebone, there is no time like the present to make the change so you, too, can become a Delaware-Lehigh Amateur Radio Club BACKBONE.

The dedicated, overworked Backbones of our club will welcome you joining them. Only in this way can the Delaware-Lehigh Amateur Radio Club continue to serve our area, nation and most important, you and your family.

from ARNS, Pasadena Radio Club Bulletin

**** CONTEST CALENDAR ****
by Barry, KU3X

Mar. 5 West Coast Qualifying Run (10-35 WPM)
Mar. 8 W1AW Qualifying Run (10-35 WPM)
Mar. 8-10 Japan International CW DX Contest
Mar. 9-10 YL-ISSB SSB QSO Party
Mar. 10-11 Wisconsin QSO Party
Mar. 16-17 Bermuda Contest
Mar. 19 W1AW Qualifying Run (10-35 WPM)
Mar. 30-31 CQ WW WPX SSB Contest

Looks like this is a good month to practice your CW with the W1AW and the West Coast qualifying runs. Try your luck, you may be better than you think. There are a lot of stations out there that do not even own a microphone and just live for CW.

If you want to work Japan in the Japan International, a good time to do that is around 2100 hrs Z on ten, fifteen, and twenty meters. These bands should be open for a few good hours. If you listen on forty meters around dusk, you may even hear a few JA's long path.

If you have time to listen to or work a few contacts in the CQ WPX contest, try to work NJ9C, John Dunker. He was a D.L.A.R.C. member and is always in this contest.

That's it for this month. Good luck and good contesting!

de Barry, KU3X

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DIGITAL COMMUNICATIONS
continued from page 2

THE CONCLUSION:

In summary packet radio takes your information (your letter) a paragraph at a time and puts it into envelopes which contain the destination address (and include the return address) and sends it to the recipient. If the checksum doesn't work out the receiver then requests a retransmission. Otherwise the receiver requests that the next packet be sent until all the traffic is passed.

The more complex the communications is the more overhead there is to accomplish passage of the information between users. Consider using an intermediate station to get to your final destination. The intermediate station must duplicate the same procedure of putting packets in envelopes and forwarding them to the next station in the chain.

FINI:

This is the fundamental concept of how our packets get sent (and routed if intermediate stations are required) to the ultimate recipient. Thus if you can contact a station (reliably) contact them directly as it halves the overhead.

Happy Blapping 73 Joel K9TBD

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(CONTINUED FROM PAGE 1)

NO-CODE TECHNICIAN LICENSE
by Robin, WA3T

The testing requirements for the new Technican license have finally emerged: here's how it works.. The written test will consist of the existing Novice and Technician test elements. BOTH must be taken at a VE session. The question pools remain just as they are now; suitable texts include the ARRL's "Tuning In the World" and "Technician License Manual".

Technician licenses issued after February 14th will all be "no-code" licenses, allowing operation only on VHF and up. The upgrade path for a "no-code" Technician will be to take the 5wpm code test. This must be done at a VE session. The FCC will keep track of who has passed the code test, but will not issue an endorsement to the Technician license. The CSCE from the code test must be kept with the license because it is evidence of the holder's authority to operate in the Novice parts of the HF bands. In other words, the Technician license and the CSCE TOGETHER are the equivalent of the pre-February 14th "full" Technician license. The popular phrase to describe this combination seems to be "Technician-plus".

Present or future Novices are not shortchanged or blocked under the new scheme. Someone who holds a Novice licence and passes the Technician written test will be issued a Technician license. Because the Novice license is evidence of code ability, but the new Technician license is not, he must keep his Novice license with his new license. TOGETHER, they make up the "Technician-plus". Upgrading from there is via the General written and code tests, as in the past.

de Robin, WA3T

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****** Helpful Hints on RFI, Part Two ******
by KU3X

If you have TVI problems, and you are on a cable system, get the cable company involved. Walk around outside with your HT tuned to 145.250. The FAA and the FCC have been getting after all of the cable companies to clean up their leakage problems. If the cable company refuses to clean up any bad leakage problems, do not be afraid to call the FCC and get them involved. As much as you don't want the FCC at your house, they don't want them involved either. If you see a full scale reading on your S meter, chances are that you have bad TV cable leakage. This must be corrected. Again, make sure that all F type connectors are put on the cable properly and are screwed tightly to its counterpart. Use a good grounding block where the TV cable enters the house and attach a solid ground wire. Put a good TVI high pass filter at the same place in the cable. You may also have to place a high pass filter behind each television and radio that is attached to the cable. RF can also follow the outside of the cable. A high pass filter will not cure this problem. The way to cure this is to wrap eight turns of the cable around an Amidon ferrite core. You may also have to wrap the power cord around a ferrite core or use an AC line filter.

Now for the telephone. This is what the FCC has to say about working on telephones and telephone lines. This comes right out of their information bulletin, and I quote, "You should not internally modify the instrument yourself nor attempt filtering outside phone lines. Only authorized service technicians may internally modify telephone instruments. Only telephone company personal may filter outside telephone lines. " When people go out and by a telephone from a local department store for $ 9.95, they bought a cheap phone and got what they paid for. Do not waste your time trying to iron out any problems in these things. With AT&T trying to compete with these things, they have come out with some real junk in the past few years. You are going to have to call the phone company and get them out to work with you. Good luck! Get the jump on them before they come out. Call the FCC at 215-752-1324 and ask them to send you bulletin # FO-10 and any other information they have on telephone interference. Also ask for their Interference Handbook. Take the telephone bulletin to any store that has a photo copying machine and make about two extra copies. When the service person comes, invite him or her into your house and sit down and review it with him or her.

If you decide to work on this problem yourself, here are some ideas that you can try:

1. At the drop, outside of the house, place one .01 microfarad @ 1KV disk capacitor from the red wire to the ground wire, one capacitor from the green wire to the ground wire, and one capacitor from the red wire to the green wire. The yellow wire is the ground wire.

2. Lift the red and green wire and put a 100 microhenry choke in series with each of these wires. Radio shack part # 273-102.

3. Make sure that all of the connections are clean and tight. Check the yellow ground wire closely to see if it is attached to a good ground source.

4. Take the telephone handset apart and place a .001 microfarad disk capacitor across the ear piece and microphone element.

5. You may also have to put chokes in series with the red and green wires that enter the telephone from the wall outlet.

K-COM has come out with two models of telephone interference filters. Model RF-1 is a plug in type module that sells for $ 16.95 and model RF-2 is a hard wire version that sells for $ 10.95. Check you local ham store or write to: K-COM, Box 82, Randolph, Ohio 44265.

73 de Barry, KU3X

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FIRST CALL FOR VOLUNTEERS
by Amy, KD3TI

The March of Dimes will hold their annual Walkathon fund-raiser on April 27. As last year, they requested the assistance of Amateur Radio Operators to provide communications. They will run both the Easton and Bethlehem races simultaneously with 5 check points and 4 to 7 sag-wagons per course..Contact me on W3OK or at my home at 820-8554 if you can help. More next month. We will need all the help we can get.



EFFECTS OF ELECTRICAL SHOCK.

Electrical ***CURRENT*** is the killing factor in electrical shocks. ***VOLTAGE*** is important only in that it determines how much current will flow through a given body ***RESISTANCE***.The current necessary to operate a 10 watt Christmas light bulb is 8 to 10 times more current than the amount that would kill a human, that is, if it actually breaks through skin and body ***RESISTANCE*** and flows at this ***AMPERAGE*** (current). A pressure of 120 volts is enough to cause a current to flow, which is often greater than necessary to kill humans. Currents of 100 to 200 ***MILLIAMPERES*** cause a ***FATAL*** heart condition known as Ventricular Fibrillation for which there is no known remedy and death occurs.

EFFECTS OF 60-HZ CURRENT ON AN AVERAGE HUMAN

Current values through the Body Trunk and the Effect

1 Milliampere, or less....Safe. Causes no sensation. Not felt at all.

1 to 8 Milliamperes.....Safe. Sensation of shock. Not painful. Victim can let go at will, as muscular control is not lost. (5 mA is accepted as maximum harmless current.)

8 to 15 Milliamperes.....Unsafe. Painful shock. Victim can let go at will, as muscular control is not lost.

15 to 20 Milliamperes.....Unsafe. Painful shock. Control of adjacent muscles is lost. Cannot let go! Fatal if prolonged. 20 to 50 Milliamperes .....Unsafe. Painful. Severe muscular contractions. Breathing is difficult. Fatal if prolonged. 100 to 200 Milliamperes...Ventricular Fibrillation and DEATH. 200 Milliamperes or more..Severe burns. Severe muscular contractions, so severe that chest muscles clamp the heart and stop it during the duration of the shock, which PREVENTS Ventricular Fibrillation! Possibility of survival!

EXTERNAL

Dry skin, 100K to 600K Ohms, at 110 volts, less than 1 Milliamperes.

Wet skin, 1000 Ohms, at 110 volts, 110 Milliamperes.

INTERNAL

Hand to Foot, 400 to 600 Ohms, at 110 volts, 220 Milliamperes

Ear to Ear, 100 Ohms, at 110 volts, 1.1 AMPERES!

SO BE CAREFUL,and 73 from ARTIE, WU2F

FCC ACTS ON PROPOSALS FOR TV, MARITIME USE

from ARRL NewsLetter

On Jan. 10 the FCC acted in two commercial matters of interest to amateurs. The Commission has proposed establishing an interactive video data service (IVDS) and would allocate 218.0-218.5 for the new service, to be known as the "Interactive Video Data Service".

The Commission hopes the IVDS systems, as proposed by a company known as TV Answer,INC. "will provide the public with a convenient method for interacting with all forms of video programming, including commercial and educational broadcast television, cable television and direct broadcast satellite service".

In the second matter, the Commission in a Report and Order amended its rules to permit Automated Maritime Telecommunications Systems (AMTS) operations on a national basis, in the 216-220 MHz band. Users operating at 217 MHz and below would be required not to interfere with television broadcast stations operating on Channel 13 (210-216 MHz).

These proposals are of concern to amateurs due to the imminent loss of their allocation at 220-222 MHz; the frequencies immediately below 220 MHz are seen as a possible partial replacement for the loss of those two MHz of spectrum.

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FOR SALE

KEYER FOR SALE

Curtiss Electronic Fist, Model EK-38. Handles 9 to 50 words per minute. Slower fists fine if allow more spacing between faster characters. Iambic Deluxe model. Runs off 120VAC. Works great. But duplicates other keyers I have. Perfect for new hams graduating from straight key to side paddles. 215-258-5063 home or 215-253-2745 office. $49.95 or best offer. Bill Goodman, K3ANS.

****

ICOM IC-2AT

Includes, IC-DC-1 (for 12 volt operation) 2 IC-BP-4 Battery packs (holds 6 ea AA Batteries. Wall Charger for BP-3 Battery Packs. All with original box, Manuals asking $125.00. Call Bill, NC3P 215 865-6234 or leave message on Bill's Packet Box NC3P-3.

YET MORE ON SPEECH PROCESSING

by Robin, WA3T

...or WHY RF processing is better.

In order to get optimum "speech-power-per-watt", we need to change the characteristics of our speech signal in THREE important ways....

First, most adult male voices contain a lot of low-frequency energy. This is wasted, from the communication point of view. So to get the maximum intelligibility per watt of output power, we need to get rid of low frequencies. This is always done before any other processing.

Second, the average level of speech varies from word to word. If we want to put out the maximum signal at all times, we need some form of automatic gain control to hold the output more constant as we talk.

Third, "hi-fi" speech is very "peaky"; the peak power level is MUCH higher than the average. These high peaks don't contribute to the intelligibility of the signal: we need to trim them off.

There are various ways of providing automatic gain-control and peak trimming, but all of them involve nonlinearity (in plain words, distortion!).

Any nonlinearity, whether it's the result of plain old peak clipping or a more modern logarithmic "compandor", results in the generation of harmonics and intermodulation products.

So what's the difference between audio and RF speech processing?

Imagine a idealized speech signal consisting of a single sinewave. When we "process" this signal, harmonics are generated.

With audio processing, these harmonics can lie within the audio band. For instance, a 400Hz tone could have harmonics at 800Hz, 1200Hz, 1600Hz, and so on. These are within the speech band and can not be filtered out. At the receiver, this signal would no longer be a pure tone and would sound distorted.

The SSB signal resulting from our idealized speech is a sinewave at (say) 455KHz. Processing this creates harmonics at 910KHz, 1365KHz, and so on. These will be filtered out by the IF and RF filters in our transceiver. The received signal would still be a pure tone, and would not sound distorted.

So audio processing leads to audible distortion, while it seems (so far!) that RF processing gives perfect results. But life is not so kind. In reality, speech consists of a rich mixture of different frequencies. The harmonics generated by RF processing are filtered out, but there's another problem: intermodulation distortion.

Think of a two-tone signal. When this is distorted by the processor, various intermodulation products are added to the two original tones. We get spurious signals at the original frequencies plus and minus the difference between them, plus and minus twice the difference, plus and minus three times, and so on. As we crank up the microphone gain, the nonlinearity becomes more pronounced and these intermodulation products get worse and worse.

Audio processing and RF processing are both equally affected by intermodulation distortion.

The bottom line, as Barry has said, is that RF processing IS better than audio processing. The WHY is because the harmonics which are generated don't corrupt the received signal. But even with RF processing, as we turn up the microphone gain the speech gets muddier and muddier as intermodulation products get worse, until our signal is very loud but totally unintelligible.

Operating manuals give limits for the maximum amount of compression. Trust them: they're based on careful tests. If the manufacturers believed that more compression would be effective, they'd be quick to say so. DON'T just crank that microphone gain up when the going gets tough. Beyond the recommended limits, MORE LOUDERER means LESS READABLE! It's tempting, but it just doesn't work.

An old gypsy once told me, "Remember, my son; enough is good, more is better!". Many years later, sadder and wiser, I've come to the realization that she didn't have microphone gain in mind when she said this. Not even with RF processing.

73 de Robin, WA3T







All Amateur Radio Operators are invited to participate in the DLARC, RACES & ARES nets on 146.70 W3OK/rpt, with an alternate of 145.11, W3PYF/rpt.

The Nets are held on Sundays at 9:30 AM and on Wednesdays at 7:00 PM.

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TALK IN ON 146.70

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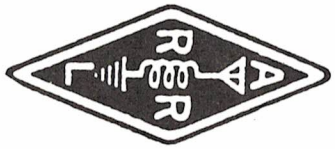



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