DELAWARE-LEHIGH AMATEUR RADIO CLUB, INC. W3OK

MAY '91

W3OK CORRAL

D.L.A.R.C.

KA3TTY DICK

SPECIAL SERVICE CLUB

ARRL Affiliated Club

SAREX, THE SECOND TIME AROUND

SECOND TIME AROUND

by Bob, W2CCE

Well, this was my second time around with the SAREX experiment. This event was now at the Hanover School in Bethlehem. The Hanover School was a particularly good choice since the brother of Ken Cameron, an astronaut on the orbiter, is Doug Cameron. Doug, his wife Linda and Ken's nephew Taylor are all associated with the school. A while before the appointed hour there were about 65 in attendance but soon the ranks were swelled to well over 200. Again there were students and parents as well as many interested parties and, it seemed, throngs of media representatives. While the local electronic news and print folks were well represented, one crew came in by helicopter from Scranton. On the way into the ABE airport WB3DYE, Bob Reynolds, from Channel 16 who was in the helicopter, contacted the school on 2 meters and the four students who were to speak later asked questions of the helicopter pilot. This event was a total success with good communications and good questions asked and answered. The students did a fine job and took it all in stride like veterans.

The setup at the school was fairly elaborate with two projection TVs and a computer. One of the TVs was used to display the output of the QuikTrak satellite tracking program which showed a map of American continents and the current position of the orbiter. The other was used to show the TV pictures from the orbiter which were supplied by the Twin County Cable Company.

In addition there were numerous amateur radios and paraphenailia. An HF radio was used for preliminary reports from WA3NAN and VHF gear for the communication links to NASA. The audio from the actual NASA and orbiter contacts was carried to the 70 repeater on UHF where Don, W3LR facilitated the connections was initiated the patch to NASA. The NASA bridge tied in the other schools as well as the 2 meter stations actually making the direct contacts with the orbiter. The output of 70 also supplied the audio for recording and public address at the school. As usual, Tom Daniels, N3CXP assisted by Bob, WF3H had made all of the arrangements and had set up the amateur station including the antennas on the roof. Tom also continued to fill the role of Master of Ceremonies throughout the session.

(continued on page 4)

THE TRUTH ABOUT TOWERS

by Bill, K3ANS

DLARC Program Chairman

Victor Piper, Representative of Rohn Towers, will be the featured speaker at the May 2, 1991 meeting of the Delaware-Lehigh ARC, Inc. If you ever desired to raise your antenna higher than the handy tree or house peak, you thought about using a tower. Some fanatics put up more than one tower! Some are so high they need binoculars to see the top. Some towers have elevators, platforms, and lights. Others are free standing and politely fit into the city lot. Height is often not better. Just ask K3OO about his best ten meter yagi which is 15 feet high! It out performs the ten meter yagi at 100 feet when conditions are perfect. Learn about crank overs, guy wires, foundations, concrete, anchors, wind load, etc. Planning a 440 Mhz. array or a 80 meter yagi? Ask Victor Piper. See you May 2 at 7:30 PM at the Northampton County Area\ Community College, between Easton and Bethlehem. de Bill, K3ANS

HI-FI FOR HT AUDIO
by Bob, KW3W

Have you ever used your HT in the car and just couldn't stand the audio from it's squeaky earphone sized speaker ? Try this Hints and Kinks. Drive over to your neighborhood discount catalog outlet store, Service Merchandise comes to mind. Buy a SONY Disc to TAPE adapter, This handy little gadget, will convert the audio coming out of your HT's earphone/speaker jack into signals your car cassette deck thinks are coming from a cassette its playing. So, you get the quality audio that your car stereo pumps out instead of all the squeaks of the HT speaker. Well, oh and you'll need to get a 1/8" stereo to mono adaptor from Radio Scrap. Pick the right diameter mono end plug to fit the earphone/ speaker jack on your HT. The audio quality will amaze you, and I think you will agree its worth the investment both time and money.

de Bob, KW3W

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CARE AND FEEDING OF YOUR PET HAM
from Southern Counties ARA via Marc

The pet ham is one of the most intelligent of pets, often seeming almost human. The following is a short guide to things you should know about caring for your pet ham.

Living Area - Your pet ham should have private area of its own where it will not be disturbed. It will spend many happy hours alone there with its collection of treasurers (boxes, wires, bits of metal, glass, paper, plastic, etc.) It should be encouraged to confine its activities to this nest room to protect the rest of the house from its natural tendencies toward noise, clutter, and making holes in the walls.

Expenses - Raising your pet ham can be an expensive hobby. However, unlike most pets, the pet ham can be trained to work outside the home for short periods and so bring in enough money to cover part or all of its expenses.

Feeding - The well-behaved pet ham will be able to eat with the family on occasion, but it feels more comfortable and secure taking many of its meals in the privacy of his nest room.

Housekeeping - Pet hams can usually be trained to use the family bathroom facilities.

Obedience training - Most pet hams can be trained to respond to a few simple commands..the easiest to teach are 'sit' and 'speak. Once your pet ham as learned these behaviors, it will sometimes practice them on its own for hours at a time.

Thanks to Philmont (BLURB).

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DECIBEL POWER TABLE

We have been hearing so much about the loss and gain of antennas and their feedlines, I thought that you may be interested in the following table, which I found in the ARNS Bulletin by WM7E. de W3PYF, Editor

dB	Loss	Gain
1	.79	1.26
2	.63	1.58
3	.50	2.00
4	.40	2.51
5	.32	3.16
6	.25	3.93
7	.20	5.01
8	.16	6.31
9	.13	7.94
10	.10	10.00
11	.079	12.59
12	.063	15.85
13	.050	19.95
14	.040	25.12
15	.032	31.62
16	.025	39.81
17	.020	50.12
18	.016	63.10
19	.013	79.43
20	.010	100.00
30	.001	1000.00
40	.0001	10000.00

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ELMER PROGRAM STARTED
by Bob, WF3H

In conjunction with the Novice/Tech class offered by DLARC being taught by Darrly, K3EX, Robin, WA3T, and Chris, NU3L, we have had an Elmers program to assist prospective hams in getting on the air. Volunteer Elmers for this session were Ed, KA3OLO; STokeley, AJ3H; Bud, WA3BOM; John, K3GQJ; Vic, N3IQD;, of course, yours truly. Fortunately, all interested novices were matched with Elmers, and should be well taken care of.

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REMEMBER, IF YOU ARE JOINING OR RENEWING YOUR ARRL MEMBERSHIP CALL TREASURER, KA3MNY, THE DELAWARE-LEHIGH AMATEUR RADIO CLUB BENIFITS.

AMPLIFIERS

by Van, K3CP

Ima Lidd said to Elmer, "Someone said that one of the local FM broadcasting stations was using a linear amplifier. Is that right, Elmer?"

"No," replied Elmer, "Linear amplifiers are used on AM transmitters. That, of course, includes upper and lower sideband (USB & LSB) rigs which are AM. Linearity is required only when you must maintain the fidelity of the audio wave envelope. This is not necessary on FM transmitters where the audio is not in an amplitude envelope. Also, it results in very low efficiency. Linear amplifiers generally run as class A or AB and FM amplifiers run at the much more efficient class C."

"Let's see if I understand you," said Ima. "We hams would use class A or AB (linear amps.) on high frequency (HF) for the sideband modes and class C (non linear amps.) on 2 meters or other VHF and UHF bands for the FM mode."

"That's right," continued Elmer. "Also, don't forget code transmissions (CW). There is no need for the relatively inefficient linear amplifiers there either."

Ima said, "We never talked about the different classes of amplifiers, Elmer. What are they and how are they used?"

"Well, there are three common classes," continued Elmer. "They are class A, B and C. There are other classes (AB, D and E), but these three are of the most interest to amateurs. Class A amps. are the best for high fidelity purposes, but are low in efficiency. They have a maximum efficiency of 50 percent but more typically run 25 to 30 percent. Class B amps. are biased so that they only operate on one half of the input wave. Considerable distortion takes place. However, this distortion can be reduced by using them in push-pull configuration or by taking advantage of the fly wheel effect of tuned circuits. The efficiency of class B amplifiers is around 50 percent. Class C amplifiers are very efficient. Values are in the range of 60 to 75 percent, but, they are not linear. They are harmonic generators as well. Frequency doublers and other frequency multipliers almost always are class C. Incidentally, this characteristic can result in severe interference to other radio and television services due to the harmonics. Because they are not linear, they would distort the audio envelope of a signal very badly. Since the audio envelope (modulation) is what will eventually come out of our headphones or loudspeakers, we would hear this distortion."

"I see," said Ima. "AM is the type of modulation that varies the amplitude of the signal and therefore we wish to maintain the integrity of the wave form. FM, on the other hand, doesn't vary the amplitude of the signal so we don't need to worry about that."

"Right you are, Ima," said Elmer. "When lightning or other noise modulates an FM signal, the clipper circuit merely eliminates the AM from the signal. This is why FM is quiet even in a thunderstorm.

"Many years ago, hams used to add the modulation after the carrier (RF) was amplified to its desired level. They designed their amplifiers to run class C and didn't worry about distortion because the audio wasn't added until after all RF amplification had taken place. Unfortunately, this required a lot of audio power, 50 percent of the RF power for 100 percent modulation."

"Wow," said Ima, "that means that if a station ran a kilowatt of RF power, it would need 500 watts of audio for phone operation."

"That is right," Elmer said. "The audio was introduced into the final plate circuit and was called plate modulation. There were other forms of modulation used to reduce the high cost of the audio equipment. They were called control grid, screen grid and suppressor grid modulation. Instead of modulating the plate circuit, the modulation was introduced into the grids of the final amplifier."

Ima interrupted, "What class of amplification did they use in the audio amplifiers?"

"That's a good question," replied Elmer. They generally used class B to achieve higher efficiency than in the higher fidelity class A amps. To reduce the distortion that class B introduced, they designed them as push-pull circuits as I mentioned earlier.

"Now the next time someone says they are using linear amplifiers on FM you can tell them to switch to class C amplifiers and get more for their equipment money. See you next month, Ima."

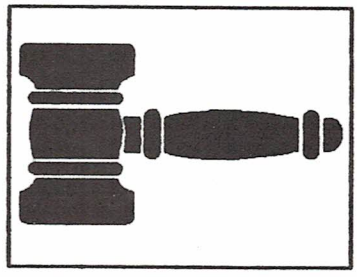
"OK, Elmer. I will look forward to our next session. Thanks a lot for an interesting talk."

de Van, K3CP

THE GAVEL SPEAKS

by Ray, W3TDF, President

Our thanks to Bill,K3ANS, for bringing us the program speaker at the last meeting. Some of those certificates were really attractive. I can visualize a wall full of them, but the amount of time and effort required to earn all of them must be a true labor of love.



Also, my personal thanks to Van,K3CP, for the valiant effort in putting the last OK-Corral together. He, now, also knows the amount of work involved, and the need for material being submitted well before the deadlines set by our regular Editor, Clarence,W3PYF. P-L-E-A-S-E, if you are a contributor, get yours in to Clarence as early as possible. And, thanks to Tom,-N3CXP, Bob, W2CCE, W3LR, and WF3H and all the others that got involved in the SAREX. As the name implies, it is an experiment, an authorized & sanctioned one, that gives valuable information and experience, which will lead to more successful ones later on.

FIELD DAY, a month and a half away. We will be gearing up for this very important activity, starting at this May meeting.

At the request of Nittany ARC, I returned the brass plate from the PA-QSO Party Revolving Trophy to have our new record contribution inscribed thereon. The Chairman, Chuck,K3CM, advises that the results should be out shortly, probably by the time you read this. The rules for this 'test' are going thru extensive revision in the next few months. We will have to study them for the changes. 73

Ray,W3TDF

820-9110

DLARC INFORMATION LINE

Call for latest information

THE SECOND TIME AROUND

continued from Page 1

Since the entire STS-37 mission communications were rebroadcast by WA3NAN at Goddard Space Flight Center it was possible to listen in on the earlier communications between the orbiter and other schools. So, excitement was high as the big moment approached. About 15 minutes before the scheduled contact the phone connection to NASA was established. No problems here. When the computer calculations indicated that acquisition of signal (AOS) was to occur in Ecuador, HC5K, Ed, began to call Ken Cameron, KA5AWP on the orbiter.....no response.....again and again but little response....only a few brief intelligible transmissions from Ecuador. Then, in about 10 minutes, he was LOS (loss of signal) in Ecuador but coming up on AOS in San Paulo where Junior, PY2BJO was to try for the contact. There were a few indications that NASA was trying to improve the orbiter attitude since that was apparently the problem again. One must remember that the SAREX experiment is not "first priority" and we have to take the conditions that are present at the time due to the other experiments on the mission. Finally, contact was made and Katie Granson asked her question followed by Patrick Howard. Katie got through fairly well but Patrick was not so fortunate.

The cooperation of the Bethlehem School District, Principal Jack Burke

The Program Manager at NASA shifted the sequence to allow one student each from the remaining schools to try. Unfortunately Hillary Martin and Jessica Segal did not get a chance due to the lost time. But soon LOS in San Paulo and the experiment was over. Not totally successful but there was still great enthusiasm among the attendees. The students were still excited as were many of the others. Patrick said, at a post-event interview, that he was a little disappointed not to have had a complete conversation with the astronauts but he was still thought that the program was terrific and a thing of great value to him and other school age boys and girls. N3CXP, WF3H, and myself were also somewhat disappointed but still thrilled by the support, interest, and enthusiasm of all. In retrospect at least we could say that everything very worked well.....except the satellite!! de Bob, W2CCE

HAMS' KUWAIT CONNECTION REVEALED

from the ARRL Letter dated April 4, 1991

Amateurs everywhere now can know the full story of a Kuwaiti amateur who was on the air during the occupation of his country, sending AMTOR messages to the outside world (ARRL Letter March 8, 1991).

On March 21 Abdul Jabbar Marafi, 9K2DZ, gave the ARRL his consent to reveal his identity and to publish his story; a major article about the 'Kuwait Connection' will appear in May QST.

9K2DZ, usually signing another of his call signs - A92ET - or no call at all, almost daily reported from Kuwait.

At first the traffic was health and welfare messages and Marafi turned immediately to his Amateur Radio friends, on the APLINK network.

"AMTOR sounds like a cricket" Frank Moore-/WA1URA told the U.S. department of State when he began faxing them copies of Marafi's missives from Kuwait City. "The transmitters pulsate on and off and much more difficult to locate with a direction finder. It also means that one receives almost perfect copy," Moore said.

Marafi's APLINK colleagues were quick to recognize the need to protect 9K2DZ by keeping the traffic quiet (at one time Iraqi troops were living in the house next to Marafi's, Clark Constant/W9CD said).

Meanwhile, aboard the USS John F. Kennedy in the Red Sea, Navy First Class Petty Officer Scott Ward/N5DST, had long been using AMTOR, and APLINK, to handle messages for the more than 5,000 Navy personnel aboard.

It wasn't long before N5DST/MM ran across the Kuwait traffic. Ward was immediately invited to join the effort, in part since his location seemed perfect for a short hop to Kuwait.

"At first we discouraged Abdul from transmitting" Foster says. Although we all were very curious, we also feared for his safety."

At least two 9K2 stations were active from Switzerland and additional links appeared active in Muscat and the United Arab Emirates, to where many Kuwaitis had fled.

It also was feared that Marafi had been compromised by his "discovery" by YI1BGD in Baghdad.

But there is no reason to believe, Moore decided, "that the YI station compromised our friend. We have excluded him from our computers. We also ask "special questions" to our friend so he can give us a sign if he were in trouble and that has not happened."

Today, 9K2DZ is active almost daily, on APLINK; now doing what HAMs ordinarily do ... talking with his friends.

Thanks to Bill/WA3SCW

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JUST THE FACTS

by John, N3IGA

During the April meeting, there was a comment made about the note on the repeater map. As far as I am concerned it was information that may be helpful to some hams that may not have a Repeater Directory and have no idea of repeater locations.

It was stated at the meeting that there was no note stating anything about the Oakland repeater and our club repeater. Let me state some facts:

1. Distances between the Oakland and Nazareth repeaters is about 75 miles.

2. Oakland's repeater is located in Bergen County with hills and mountains between it and Nazareth.

3. Where Oakland is located, the only hams locally that can access our repeater are the ones that are in a high location, using high power or both. The Oakland repeater has an antenna mounted on its tower to prevent interference with our area.

4. Also the Oakland repeater is not even on the map, because the map did not include East New Jersey's repeaters, just repeaters in Eastern Pennsylvania and a few in NJ that can be reached from the Lehigh Valley.

The distance between Allentown and Cherryville, NJ (which is where the other 147.135 machine is located) is about 35 miles. That is definitely too close, and there would be more problems because of being so close.

It boils down to one thing. You don't need to use 10 to 50 watts for a repeater when you are less then 10 miles from the site. This is definitely too much power.

We all had to take a theory exam to upgrade, and you can always find a question on the test about how much power should be used. Maybe we all should sit down and re-read the theory books and start practicing proper procedures instead of nit-picking helpful information.

de John, N3IGA

** CONTEST CALENDAR **

by Barry, KU3X

May	3	ARRL Spring sprint 902 MHZ
May	4-5	ARI International DX contest
		MARAC County hunters CW
		Danish SSTV contest
		Ten-Ten International Net spring CW QSO party
May	9	ARRL Spring sprint 1296 MHZ
May	11-12	A. Volta RTTY DX contest
		CQ-M contest (Peace to the World
May	12	W1AW Qualifying run 10-35 WPM
May	16	ARRL Spring sprint 2304 MHZ
May	18	Armed Forces Day
May	18-20	Michigan QSO Party
May	19	OMARC Spring midnight special
May	24	W1AW Qualifying run 10-60 WPM
May	25-26	CQWW WPX Contest CW
		ARRL Spring sprint 50 MHZ
May	26	ARCI QRP Hoot-Owl sprint CW

Looks like a lot more of VHF/UHF contesting for the month of May. Take another ride in the mountains like you did in the month of April and do some more mountain topping.

Any RTTY people in the club, or is everybody now on packet? On May 11 and 12 there is a nice RTTY contest to enter. Fire up the old green keys and give it a whirl.

Don't forget the Michigan QSO party. The more practice you get in a QSO Party now, the better you will be in the Pennsylvania QSO Party.

It looks like one more big one before the summer sets in. CQWW WPX Contest!

Good luck,

de Barry

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FOR SALE : HUSTLER KW 75 METER RESONATOR. $20 BARRY (KU3X) 691-8888.

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FOR SALE

440 XBeam..Assembled $35.00..Complete Apple 2C Computer System. Monitor, Imagewriter printer, Joystick, external 5 1/4 in drive, and much software..$400.00 firm..call N3GXW, Norm at 262-8415.

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The Radio Amateur/Shortwave Listeners Guide to the 800 Numbers

Compiled by: Pete Kemp, KZ1Z

Company	Location	1-800-###-####
Ace Communications	Indianapolis, IN	445-7717
Alexander Batteries		247-1821
All Electronic Corp	Van Nuys, CA	*826-5432
Amateur Electronic Supply	Milwaukee, WI	558-0411
Amateur Electronic Supply	Orlando, FL	327-1917
Amateur Electronic Supply	Wickliffe, OH	321-3594
Amateur Wholesale Electronics	Watkinsville, GA	451-2397
Amp Supply	Raleigh, NC	346-5701
Austin Amateur Radio Supply	Austin, TX	423-2604
C-Comm	Seattle, WA	426-6528
C & S Sales	Deerfield, IL	292-7711
Colorado Comm Center	Denver, CO	227-7373
Communications Specialists	Orange, CA	854-0547
Communications Electronics	Ann Arbor, MI	USA-SCAN
Communications Elec. Spec.	Winter Park, FL	327-9956
Digital Radio Systems (DRSI)	Clearwater, FL	999-0204
EGE	Woodbridge, VA	444-4799
EGE	Salem, NH	444-0047
Electronic Equipment Bank	Vienna, VA	368-3270
Grove Electronics	Brasstown, NC	438-8155
Ham Radio Outlet	Anaheim, CA	854-6046
(The) Ham Station	Evansville, IN	523-7731
Hamtronics	Trevose, PA	426-2820
Henry Radio	Los Angles, CA	421-6631
Jan Crystals	Ft. Meyers, FL	237-3063
Jun's Electronics	Culver City, CA	882-1343
K-Comm	San Antonio, TX	344-3144
Madison Electronic Supply	Houston, TX	231-3057
Memphis Amateur Electronics	Memphis, TN	238-6168
MFJ	Mississippi State, MS	647-1800
Missouri Radio Center	Kansas City, MO	821-7323
Optoelectronics, Inc.	Ft. Lauderdale, FL	327-5912
Orion Hi-Tech	Calabasas, CA	255-7020
Periphex, Inc	Southbury, CT	634-8132
R & L Electronics	Hamilton, OH	221-7735
Reno Radio	Sparks, NV	345-5686
RF Enterprises	Merrifield, MN	233-2482
Tandy National Parts (RS)	Ft. Worth, TX	442-2425
Telex/Hy-gain	Minneapolis, MN	328-3771
Texas Tower	Plano, TX	272-3467
TIC General	Theif River Falls, MN	423-6417
Universal Electronics	Reynoldsburg, OH	431-3939
Williams Radio Sales	Colfax, NC	523-0347
Wilson Antenna	Henderson, NV	541-6116
(The) Wireman	Landrum, SC	727-WIRE

MEETING MINUTES
by Chris, NU3L

The April 4th meeting of the DLARC was called to order by Ray, W3TDF at 7:30 P.M. A total of 81 members and visitors attended the meeting which was held at the theater at Northampton Area Community College.
a. The treasurers report was presented by Roy, KA3MNY and approved as read. It was noted that the phone bill included a carryover from the previous month. b. The minutes of the March 1990 meeting were approved as published in the W3OK Corral newsletter. c. W3TDF gave a demonstration of original American Morse using a land line telegraph unit brought in by W3TEB. d. DLARC and PA QSO party patches are available. Contact KA3MNY. e. A second Sarex program is scheduled for early April, most likely on Saturday the 6th if the launch goes off on time. N3CXP is again coordinating the activities. During the experiment the W3OK repeater phone patch will be disabled. f. Future mailing of the W3OK Corral newsletter will be by bulk mailing. This will be more economical and somewhat more efficient than the current mailing practice. g. The coaxial cable feedline for the DLARC packet node located at K3ANS will be rerouted. This is to provide for adequate lightning protection. h. A DLARC equipment inventory is being assembled for insurance purposes. K3YD has a listing of the serial numbers of the equipment in the station located in the Greystone Building. Data on the repeater equipment (both W3OK and W3PYF) is still needed. Towers and antennas will not be insurable. i. John, K3GQJ reported that the ARRL has given special recognition to the DLARC for it's efforts in the VE testing program. j. There were no issues reported from the awards and technical committees. k. Field day will be held on June 22-23. Details will be discussed at the May meeting. l. KB3RI is coordinating the club picnic which will be held on August 18. He could use some help. m. A repeater conduct guide is in preparation and should be available soon. n. An individual, who apparently represents the interests of the group which maintains the repeater operating on 147.135 which identifies as W3OI, registered a complaint regarding a note pertaining to that machine which was placed on the repeater map which was published in the April issue of the W3OK Corral. Discussion ensued and a motion to drop the subject was seconded and passed. o. N3GXW has a Tandy 1500 for sale. Asking price is $1000. p. Carl, KA3TEQ recently received his DXCC award. Congratulations! q. WA3T has the schematics and software available for an IBM compatible single chip modem which functions like Digicom. Contact Robin for more information. r. Harlan, N3IUW reported that the Fort Meyers ARC is starting a special event radio station which will operate from the Edison home in Fort Meyers, FL. Operation will be in late February and different special certificates will be printed each year. The awards are expected to become collectors items. s. The DLARC welcomes K3BKR, Bruce; K3KCU, Albert; and KB2CMK, Joe as new members.

The program for the evening was presented by Harry, W3FM. Harry collects award certificates of all types. He showed many of them and explained what is required to apply for them. Thanks for a colorful presentation, Harry.

Submitted by Chris, NU3L, acting secretary.

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APRIL VE TESTING
by John, K3GQJ

At the April 5 session, 15 candidates took a total of 29 elements. There were 12 upgrades. These included:
Dennis S Hochstrasser, new General
Michael Russo, new Technician
John Rorabaugh, KA3MQJ, new General
Joseph F Leddy, new Technician
Richard F Reynolds, new Technician
Thomas F Cramer, KA2RTI, Advanced
Beorn B-W Sunflower, KA3YEA, General
Robert S Haney, new Technician
William D Gontz, new Technician
James D Hutchinson, WA2ZGO, Extra
Harmon M Purviance, N3INK, General
Peter N Kroeger, N3HWR, General.
The VE Team at this session included:
Don Holmes, KC3II; Eddie Gigliotti, W3APE; Bob Dickinson, W2CCE; Amy Lee Hester, KD3TI; Robin C Moseley, WA3T; Alex Ostapenko, WG3C; Ken Weierbach, WC3Y; Ray Bilger, W3TDF and John Greenage, K3GQJ. The May 3rd session will have team 1 attending.

73 de John, K3GQJ

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REMEMBER, THIS MEETING AT THE NORTHAMPTON COMMUNITY COLLEGE...AUDITORIUM! MAY 3rd.

DIGITAL COMMUNICATIONS
by Joel, K9TBD
Ear and Eye - Two Natural Wonders

This article is concerned with two wonders of the world. Are they analog or are they digital? After you read this piece, make up your own mind. We have probably the finest detectors in the universe - right in our heads! They help us decode signals from very weak sources, - heavy QRM and QRN while chasing DX and QRP contacts on the 160 Meter band. They are the EARS and the EYES.

I cannot stress enough the fantastic capabilities of our ears and eyes. Together with these magnificent detectors (of signals) the mind combines signals and processes them is a fashion that no computer or other man-made device can. Just a trivial point, when copying some Morse code in a noisy environment, I could do much better than one of the best electronic boxes today. The box did as well as I could up until the signal to noise (S/N) ratio deteriorated - then the EAR/MIND combination excelled. Try copying machine sent code in bad conditions with a BOX. Compare that to your own capabilities (whatever your speed). You will find that your capabilities are better than any box - they always will be.

I had the great pleasure of working with Steve Reyer, (WA9VNJ) for about five or so years. His Masters thesis was on exotic decoding of Morse signals. He implemented a Morse decoding system on an early computer - then transported it to a micro-processor and eventually sold it for a few years. This was long before the 'modern' boxes became available. His advisor was so intrigued with the concept that he finally became a ham. The advisor then went on to invent first scan converters - since he could legally tinker with such signals and try then against the real-world.

Often, I have stated that the EAR-EYE-MIND combination is the best decoder in the world, never to be beaten with inventions of mankind. Let's look at a few numbers and then you can decide for yourself. Also decide if we are digital or analog - this is a great debate!

Of a wave, electrical, photonic, or acoustic, we often describe the POWER DENSITY in Watts/Area. In other words, how many watts are available per square meter or square foot, etc. This is like your transmitter, - you transmit 100 watts, but how many watts are received by the other end. Remember the inverse square law regarding the power density? If you have a light bulb which produced some power (say a 100 watt bulb), then the power (per unit area at one foot from the bulb is 100 times the power per unit area at 10 feet). With this in mind, let ZERO dB be the measure of hearing, the following table is of interest:

Hearing:

Sound	Level (W/M*M)	Level (dB) Painful
1	120	
Riveting	3x10^-3	95
....		
Threshold of Hearing	1x10^-12	0

This is quite a range of our ears! 120 db or 12 factors of powers of 10. So we ask, what can the EAR really hear? Suppose we consider 3,000 Hz tone, then we can compute (considering the diameter of the eardrum) that the threshold of hearing (in movement of the eardrum) is about 4 one thousandths of a milli-micron! Believe it or not! The threshold of pain becomes about 1/100 of a millimeter displacement of the eardrum. We have a hearing threshold of 10 to the power 12 - amazing. Our perception of sound reduces to about 1/100 of the diameter of an atom. Hmmmmmmmmmm..

Sight:

Here are some interesting facts about the eye as a detector. Still haven't mentioned the combination of the ear/eye/mind as the supreme filter - but you will have to think about that for a while.

On the average, the EYE has a resolution of about 1 minute of arc (1/60 of a degree). That is the average, but if you calculate the angle of resolution of a piece of oak (its stripes) across the room - say ten or fifteen feet, you come up with a much better resolution. That is because the density of the eye's receptors is higher in the center of the back of the EYE (Fovea). We can decide that a signal was/or was not there in about 1/50th of a second.

How sensitive is the EYE? At 510 nano-meter wavelength (middle of the eye response), the eye can detect 3.9x10^-17 Joules of energy. This is equivalent to our eye detecting 100 photons! Gawd! The neat part is that our eye is only about 10 percent efficient - in other words we really detect only 10 photons hitting the Fovea! The best photo-multiplier tubes only approach this limit!

USE your EYEs and EARS to Detect signals from your radio! They are indeed the best in the world. No manufacturer can exceed their specifications! No filter or frammis will do better, so use your EYES and EARS and compete with the pile-up. Use your mind to interpret the results and you too will be a winner!

73 Joel, K9TBD

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FOR SALE

Kenwood TS-430S For Sale

Package deal only. Will not sell separately Includes:-

TS-430S -- HF transceiver
PS-430 --- Power supply
MC-80 ---- Desk mike
MC-42S --- Hand mike
YK-88SN -- 1.8 Khz. SSB filter
YK-88C --- 500 Hz. CW filter
YK-88A --- 6 Khz. AM filter
Maint. Manual

One owner and in good condition.
Sell to best offer.

K3CP, Van.

Alpha 76A Amplifier For Sale

Excellent condition $1250.00..Call Howard AE3T at 215 395 9716

With apologies for the long delay, here's the annual report on the financial health of DLARC. To use a New York phrase, "We didn't do half-bad last year." (FISCAL 1990 was from November 1989 to October 1990.)

DLARC COMPARATIVE ANNUAL INCOME & EXPENSE REPORT

INCOME	Fiscal '88	Fiscal '89	Fiscal '90
Dues	$2688.00	$2739.00	$3252.00
ARRL Dues	628.00	1039.00	1092.00
Interest	109.77	122.79	286.68
50/50 Income	293.00	108.00	328.00
Miscellaneous	45.00	1053.75	51.75
Fund-Raiser	966.00	2403.00	1857.00
Banquet/Party	880.75	1712.44	562.38
Book Sales	0	565.00	1105.75
Jacket (etc.) Sales	0	Incl in misc.	1172.50
Donations	86.00	35.00	189..00
TOTAL INCOME	**$5696.52**	**$9783.98**	**$9897.06**

EXPENSES	Fiscal '88	Fiscal '89	Fiscal '90
Newsletter Printing	$858.60	$879.80	$975.20
Newsletter Postage	746.23	866.85	956.15
Telephone	406.25	446.86	709.26
ARRL Dues (member paid)	575.00	1018.00	1049.00
Club Administration	66.00	118.80	39.30
50/50 Prizes	85.11	0	32.68
Banquet-Party-Picnic	1155.22	1963.17	1031.17
Field Day	281.52	525.16	616.89
PA QSO Party	91.24	30.00	174.11
Maintenance	0	0	1745.11
New Equipment	152.90	373.14	240.38
Sympathy	46.50	135.66	204.43
Legal/Insurance	950.	0	273.90
Book purchases	0.	406.35	1272.46
Program Expense	0	12.25	46.87
Fund-Raiser	see above	514.94	664.30
Jackets, etc.	0	0	1600.00
Miscellaneous	53.84	212.25	181.50
TOTAL EXPENSES	**$5468.41**	**$7503.23**	**$11,813.81**
BEGINNING BALANCE	$1160.16	$1388.27	$3669.02
ENDING BALANCE	$1388.27	$3669.02	$1752.27

Oh, some things weren't great. A summer lightening strike and other needed repairs cost us almost $1750. The biggest part of that was a new repeater controller. The controller is insured now so we shouldn't face **that** bill again.

We had two fund raisers in 1990, the regular ticket selling project, and the PA QSO party logging program (thanks again, K3CP & WA3T.) In spite of these two efforts we raised less in 1990 than in 1989--by almost $700. These fund raising projects help keep dues affordable and let the club do some good things--like sympathy flowers to the family of deceased members and running a great Field Day and .... Our club meeting 50/50 or book-prize drawing income increased by $220 from '89 to '90, so it seems like the members who attend meetings are doing "their little extra" to keep things going & growing.

The increase in book purchases and sales means that our instructor team has been real busy with Novice/Technician and General license classes. Several radio clubs, not just DLARC, are growing because of the efforts of a few dedicated instructors and their helpers.

The big question--do we need a dues increase? Could be. Our "rainy day" money dropped by over $1900 last year. The club now operates a packet node, two repeaters, and a club station. If we [or Murphy] decide that we have to replace one of the repeaters, we're looking at a **BIG** bill. I heard one estimate of over $6500 for a reliable "commercial grade" repeater. The idea in building up a "war chest" was to have enough money in the bank when we need it. A dues increase isn't the only way. We could do more or bigger fund raisers, work harder on the 50/50's or come up with another way to raise $$$. But, if we don't think about equipment upgrading or replacement now we could be left with no club station or no repeater in a few years.

I don't want this column, or our club meetings, to sound like Jim Baakers' TV show, but guys and gals, we've gotta think about it now, not after the repeater has burned up. A dollar or three from 300 of us, over a few years could help build a nice rainy day fund. A $4000 fund raiser is possible and another way to get ready for "the rain." Or, we could be like the first little pig and build our club out of straw. It's our choice. Remember though, not talking about it is making a choice--for the club of straw!

73 de K3YD







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.

+++++++ DLARC INFORMATION LINE 820-9110 ++++++++

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1991

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All regular meetings of the D.L.A.R.C. are held on the first Thursday of each month at 7:30 PM at the Northampton County Community College

TALK IN ON 146.70

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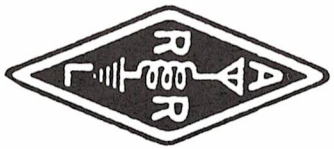



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The W3OK CORRAL

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