15 METER SLOW NET

VOL. 19 NO. 9 VOL. 19 NO. 10

Crosstalk is published monthly by the Gloucester County Amateur Radio Club.

P.S. Except this month, due to us missing a month because of loose gears. Hi...

## THE CROSSTALK STAFF

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2 METER FM 6 METER AM 10 METER RAG		CLUB NETS		78-18 50.9 28.8	Sunday Sunday Friday	8 PM 8:30 PM 9:30 PM

THERE WILL BE A MEETING ON OCTOBER 5TH AT NATIONAL PARK. THIS WILL BE OUR 2ND MEETING AT THE NEW HALL, IF YOU MISSED LAST MONTH'S MEETING TRY TO MAKE THIS ONE. FOR THOSE OF YOU WHO NEED INFORMATION; JUST GO TO NATIONAL PARK AND ASK ANYONE WHERE THE MUNICIPAL HALL IS LOCATED.

21.175

Friday

7:30 PM

DEADLINE, FOR SUBMISSIONS FOR THE NOVEMBER ISSUE IS OCTOBER 17TH, MONDAY. BECAUSE YE EDITOR IS GOING ON V A C A T I O N ... PLEASE MAIL ANY CONTRIBUTIONS TO ME.?? RAY MARTIN WB2LNR

I hope you all found our new meeting facilities at the National Park Municipal Building to be to your liking. This arrangement is temporary and your House Committee is still working, trying to find a property where we can establish our own permanent Club facilities.

We are planning a work-party on Saturday morning, Oct. 8th, to move our Club belongings from the Pitman Boro Hall to our new meeting place in National Park. We will need one or two pick-up trucks and as many people as possible to help with the move. So, be ready to volunteer your services at the next meeting. The more people we have the easier it will be and should only take two or three hours.

The Founder's Award Committee has been established and is off and running. The Committee Chairman is Rich Netherby; and serving with him on the Committee are Chick Naylor and Wayne Welsh. They will formulate the ground rules for the award and present their recommendations to the Board of Directors for approval. As soon as those plans are finalized, you will be advised.

I was really pleased with the turn-out for our last meeting and look forward to even more of you coming out on October 5th, at 8 PM. Remember, the meeting will be at the National Park Municipal Building.

See you there.

HERB SCHULER K2HPV

# FIELD DAY 1977

A large number of members, including a lot of new faces turned out to make this the highest scoring field day in the history of the Gloucester County ARC. The weather this year was nice except for a little rain and some QRN thanks to some very close lightning.

In addition to the band chairmen and operators thanks go to WAZOMY, WAZVOY, WZLVW, WAZMMA for power, and WBZGES for the sandwiches. Also congradulations to the Novices for breaking a Club record with 52 contacts under the direction of WBZAOL.

(editor's note) Although a list of all the operators was not handed in for publication The Board wishes to thank all who participated, and hopes that next year's field day will produce the same, if not better results.

BAND CHAIRMEN 80-WB2OSQ	cw oso's 138	PHONE QSO'S 276	
LO-WB2BVV	207	24	EMERGENCY POWER
20-WA20MY	68	152	100 %
15-WA2VCZ	26	231	4020 - TOTAL SCORE
10-WA2VCZ	<b>Great</b>	22	4,120
6 -WA2VOY	18	90	7 TRANSMITTERS.
2 -VB2BZY	<b>50</b> , 144	197	
	509	992	

OTHER YEARS ARE AS FOLLOWS: 1959 - 1968 TOTAL SCORE WAS LESS THAN 1,000 1969 - 1976 TOTAL SCORE WAS LESS THAN 1,600

#### CONTEST CORNER

OCTOBER	29 & 30 CQ Worldwide DX Contest,	Phone
NOVEMBER	5 & 6 ARRL November Sweepstakes,	CW.
NOVEMBER	19 & 20 ARRL November Sweepstakes,	CW.
NOVEMBER	26 & 27 CQ Worldwide DX Contest,	CW.

### NEW CONTEST PROGRAM

As you know, the club's contest program has not been very successful in getting the members to participate over the past couple of years. There are a number of reasons for this lack of interest, including the low ebb in the sunspot cycle, among others.

Your Contest Committee has decided to try a different approach for the upcomming contest season. The emphasis will be on the improvement of the overall <u>club</u> score in the various contests, and with recognition for member's contributions toward improving the club standing in the various competitions.

With this in mind, we announce the "MEGAPOINT CONTESTERS AWARD ".. It will be available to all club members who contribute one million contest points to the club aggregate score. The award can be won whether it takes one contest, or one year, or even 10 years, there is no time limit. Points scored in any of the contests which the club enters as a club entry will count. At the present time these include:

ARRL NOVEMBER SWEEPSTAKES (WEIGHTING OF SCORE X 5 )
CQ WORLDWIDE DX CONTEST (WEIGHTING OF SCORE X 1 )
ARRL VHF SWEEPSTAKES (WEIGHTING OF SCORE X 50)
ARRL DX COMPETITION (WEIGHTING OF SCORE X 1 )

Points credit for each contest has been given a weighting factor to compensate for the differences in scoring methods. For example, if you score 5,000 points in the VHF SS, you will get 250,000 points toward the Megapoint Award. You would have to score 50,000 in the November SS, and 250,000 in the DX Competition to get the same number of points for the award. If you have another favorite contest which has a club competition, let the committee know, and it can be included at any time.

Endorsements to the award will be made for each additional million points contributed. Only scores listed in the official results will count. Disqualified scores will not be counted. Multi operator setups will have one half the points scored, divided among the operators according to the way the group itself decides, and advises the committee. The starting date for points credit will be October 1, 1977. The contest committee will maintain all records, and all you have to do is enter the contests, and credit the club when you mail your logs in. The committee will continue to provide log forms, and mail in your logs if you desire.

We hope that all you potential Megapointers will give it a try. Remember, there is no time limit to accumulate the points, so every bit of participation will help. Sharpen your operating skill for a possible emergency by entering a contest.

While we will never give the contest clubs any serious competition, we do hope to continually improve the club score and our position in the competition. The award idea is a variation of one given by the P V R C., one of the top contest clubs, and certainly hasn't hurt them.

73, KEN N2CQ

### RADIO WAVE PROPAGATION ART OR SCIENCE BY: K2JF PART (1) THE ATMOSPHERE

High above the living map that is the surface of the earth is located a twilight world, forever lit by the sunlight reflected from the thinly scattered molecules of the upper atmosphere. In this world is so little oxygen that human life would be extinguished in an instant, sufficiated in a near vaccum. Yet the protective blanket of molecules that does exist shields us from the blistering hail of charged particles emanating from outher space and protects us from the scorching blast of the sun. It is this reason that the aerosol cans have now been outlawed by the U.S. Government, since they have proved that the flourcarbon material released in the spray tends to destroy the protective screen around our earth.

This is the region of space in which the atmospheric pressure is so low that free electrons and positive and negative ions exist, created from raw oxygen, nitrogen and hydrogen by the never ending deluge of ultra-violet radiation from the sun. As the unending rain of radiation falls upon this upper atmosphere, the ionization of air molecules partially exhaust the energy content of the radiation, preventing human life from being burnt to a crisp by the deadly rays. The protection of mankind from cosmic radiation by this deep, ionized sea of air is taken for granted by most people, intent upon their terrestrial problems. Only a few scientists observe and study the undulations and vagaries of the ionized layer, which is forever being lashed and tormented by powerful radiation from the sun.

Of paramount importantance to the 350,000 radio amateurs scattered over the face of the globe is this lofty, ionized blanket, for it is in the heart of this area that radio signals of certain frequencies are mysteriously reflected back to earth, permitting the amateur radio enthusiast to talk to his fellow hobbyist in all corners of the world.

Just as the telephone company technical department must be throughly familiar with the electrical and physical properties of the wires and cables over which telephone conversations are carried from point to point, so must the radio amateur understand the electrical and physical properties of the space through which his signals are to travel from transmitter to receiver. This space—the earth's atmosphere—through which the radio wave is propagated is an extremely complex and variable medium. Without the atmospheric contents of the space, however, most radio communication as we know it would be impossible because of the curvature of the earth's surface.

Before Marconi proved that a radio wave could follow the curvature of the earth, it was believed that radio waves, like the shorter light wave lenths, traveled essentially in straight lines and could not follow the earth's surface beyond the horizon.

After his experimental results were announced, scientists began to investigate the question of propagation of radio waves more thoroughly, and in 1909 Arnold Sommerfield, a German physicist, published a celebrated paper on the radiation from a short vertical antenna at the surface of the earth, and the effect of the finite conductivity of the ground upon the radiation. Sommerfield's analysis indicated that 1. Energy was directly propagated in a straight line from the transmitting to the receiving antenna (direct ray); 2. Energy was propagated by means of a ray that was directed to the earth, reflected from it, and them impinged upon the receiving antenna (ground-reflected-ray); 3. And finally, energy was propaged by means of a wave that moved along the surface of the earth, and hence was called a surface wave. This wave could follow the curvature of the earth, and hence could explain reception beyond the line-of-sight. The direct and ground-reflected rays at the low frequencies then employed tended to cancel one another by the process of destructive interference so that at those frequencies it appeared that only the surface wave was instrumental in affording communications.

Marconi found that the lower the frequency, the farther the wave could travel before it was attenuated to a degree such that it was too weak to override the natural static of the atmosphere, and so lower and lower frequencies were employed for commercial purposes, and the higher frequencies were alloted to amateur use.

Amateur radio was limited to little more than line-of-sight transmission in the spectrum of 200 to 1000 meters. Chained to a wave travelling along the surface of the earth, occasional long distance contacts by the amateur were the exception, rather than the rule. After World War L amateur operation in the unexplored 200 meter region showed promise of long distance communication by unthought-of means, culminating in the famous Trans-Atlantic test of 1921 when 30 pioneer American amateur stations were heard in Scotland.

However Sommerfeld's analysis seemed to justify this allocation: the surface wave was attenuated by the resistance losses in the earth, but the effect was less at low frequencies than at high frequencies, and as a result low-frequency ground waves traveled over large distances before being attenuated to the minimum usable intensity. For example, Station NSS at Annapolis operates at about 18.7 KHZ with a power of several hundred kilowatts. Its radiation is essentially a surface wave which gives reliable reception over thousands of miles practically day and night. Today Project Sanguine, of the U.S. Navy, is considering using one megawatt at 47.5 Hertz. for global communication with the Submarine Fleet. In the early days of the low frequency, waves were easier to generate at high power than high-frequency waves. And in view of the greater distance of reception, it is easy to see why the trend was to the lower frequencies, in spite of the greater difficulty in radiating and receiving the long waves with antennas of practical size, and in spite of the larger coils and condensers required in both the transmitting and receiving units.

Strangely enough, however Sommerfeld made a mistake in sign in his formula, which error he subsequently corrected in 1926. The corrected formula was corroborated by Van Der Pohl, Wise, Burrows, Norton, and other scientists, and seemed to indicate that a surface wave did not exist, at least of the type previously considered. However, thelast mentioned scientist, K.A. Norton, has shown that one can still consider the radiation from a short vertical antenna near the earth as being made up of the direct ray, the ground-reflected ray and a surface wave.

The result of all these investigations, as well as those of others regarding the ionized layer of air above the earth's surface (the ionsphere), has been that although it is now more fully appreciated how complex radio transmission really is, its very complexity is recognized as an aid rather that as a hinderance in the art of connunication, for different frequencies and accompany phenomena permit different types of services to ve utilized, such as broadcasting, point-to-point communication, long distance transmission, etc. Hence, although the second World War has accentuated the use of micre-waves (very high frequency waves.), one must not overlook that all feequencies are useful, and are by no means to be neglected.

### MODES OF TRANSMISSION

The surface wave is theoretically present at all frequencies, and is a result of the reaction of the finite conducting earth upon the energy radiated into the atmosphere near its surface. Is is guided by the curved surface of the earth, just as electrical energy is normally guided in an ordinary electrical circuit around bends by the two wires of the circuit. For this reason receiving antennas beyond the horizon of the transmitting antenna can pick up energy: the surface wave will travel around the bulge of the earth and reach the receiving antenna.

However, the earth that guides the surface wave also absorbs a certain amount of energy per unit length, and ultimately attenuates it down to a non-usable degree. The distance that the ground wave can travel before it is attenuated unduly is greater, the greater the conductivity of the earth, and the lower the frequency.

For example, for average earth conditions, a surface wave of 1Mhz (in the standard broadcast range) can travel as much as 100 miles or so before it is attenuated to a value comparable to the sky-wave intensity at that point, whereupon "fading occurs." Hence, the so-called primary service area of a broadcast station may be as much as 100 miles.

On the other hand, at a high frequency at 50Mhz. (in the five meter band) the surface wave is attenuated so rapidly with distance that it is of no value for even line-of-sight distances. In this frequency range one can disregard the surface wave and instead consider the direct and ground-reflected rays, a combination known as the space wave. It will be shown that at ultra-high frequencies the space wave is the important means of communication, whereas at low frequencies, such as in the standard broadcast band, the surface wave is the important factor.

Under certain conditions, however, the space wave may be of importance even at low frequencies. The surface wave decreases very rapidly in intensity as one moves away from the earth. Thus, in plane-to-plane communication, the surface wave is very weak if the airplanes are flying very high, and are not separated by too great a distance. Fortunately, however, these conditions are favorable for the space wave, so that the latter is available for communication where the surface wave fails to be of use.

Finally, there is the question of long distance communication. It was stated previously that the amateurs were given the then gigh-frequency part of the spectrum (frequencies in excess of 1.5MHZ). The amateurs diligently began to exploit this frequency range, and soon began to report instances of remarkably long distance reception.

Investigation indicated that this was due to high-angle space waves that were reflected from or refracted (bent) by an ionized layer of air known as the ionsphere, back to the earth at distances many thousands of miles from the transmitter. In many cases the reflections were concentrated in distant regions of the earth, with no reception on the intervening portions of the earth. This was known as SKIP DISTANCE. But one of the most interesting features of this short wave transmission was the low attenuation suffered by the refracted space wave, so that very little transmitter power was required. It was not long before important commercial uses began being made of the short waves, and today they are among our most useful frequencies.

PART 2 NEXT MONTH - ( BOY ARE YOU WINDY JOHN -- RAY ).

FOR SALE: DUMONT 20 WATT 2 METER (CONVERTED COMMERCIAL) FM MOBILE, DUAL FREQ. CRYSTALS FOR 146.34/.94 WITH BOOK, CABLES, ANTENNA. \$ 30.00 CONTACT: WB2RVE...

FCC NEWS: A berkeley, California company has been granted several experimental licenses to operate in the 160 Mnz. band. They are going to relay information on seismic activity of faults in the vicinity of the Humbalt Bay Nuclear power station.

- \* A businessman in Los Angeles was convicted on two counts of manufacturing two KW CB linears. (BROADCAST ENGINEERING).- He was also selling them...
- \* The B B C has fallen upon hard times, as a special British study group has recommended a 40 % reduction on international short-wave broadcasts. One third of the B B C 's overseas service transmitters would be scrapped under the measure. This is due to the economy. Broadcasts in Japanese, Burmese, and Somali would be abolished, and also, Arabic and Spanish would be cut in half. WB2RVE. --TNX.

The Radio Corporation of America (RCA) has jumped on the home videotape recorder band-wagon,, their \$ 1,000.00 "SELECTRAVISION" got on the market this month..

Ignorance of the FCC rules and regs is no excuse, but it is better than having no alibi at all.

A.R.N.S.

For those of you who are new to the Club and dont know it, the club puts out a very nice certificate to members who work other members. To get the certificate one should 1. Work other club members. 2. QSL them, to the extent of 15 club members. 3. When you receive the initial 15 QSL's, submit them to our very capable corresponding secretary— DELLA PARKER. Upon careful scrutiny, Della will issue the certificate. Della Parker, W2AFZ.

TNX DELLA, RAY.

#### OCTOBER PROPOGATION FORECAST

1.8-2.0 Mhz. Look for DX around sunrise and sunset but this band is the best when a path is in complete darkness. Your best bet is when the sun is just rising in its easterly point for its path. For Europe 0700 GMT. The static noise level is now getting down to workable conditions, this band will be in pretty good shape for the contest.

3.4-4.0 Mhz. You operators who like the lower bands can now start singing, "Things are getting better all the 'time." Our life giver is acting up and things are going to pop on this band. Darkness hours are for you lovers and the sunrise period openings to the west, all across, follow the sun. For Europe your best time will be from 2300 to 0100 local time. Static should be lower, and as the month moves on, it will diminish quickly. Around the 13th thru the 16th look for Asia openings and south pacific at dawn plus or minus one hour. You Novice boys, here is your chance to work those western stations and KH6 land for your WAS.

7.0-7.3 Mhz. It has arrived. Openings toward Europe will be excellent. The opening will start around 1600 and improve all through the dark hours. So Africa, So America, So Pacific, (notice anything?) during the darkness hours. Want WEST? Just about sunrise, the land of the Rising Sun will be there to greet you (ah so) but when he is there get him fast, for when this band closes it will close very rapidily.

EUROPE & NORTH AFRICA	1800-2000
	0200-0300
EUROPEAN-USSR	01.00-0300
WESTERN AFRICA	2000-0200
SOUTH AFRICA	1900-2200
SOUTH PACIFIC	0200-0600
AUSTRALASIA	0500-0700
CARIBBEAN, CEN. SO. AMER.	1900-0300

14 -14.3 Mhz. You contest bous - Again THIS IS THE BAND. All the world will be open to you between sunrise and a little after sunset. During the 13th and 16th. 20 -22 and 28 - 30, you should be able to work many tropical areas. Look for the Sun-horizon window -- two hours after sunrise two hours before sunset. Very good DX, high signal levels from all over. The F2 will be well packed and good one-two hop skip. The rapidly increasing sunspot activity of Cycle 21 will increase the MUF, it will be just right for the phone contest.

CENTRAL EUROPE, SOUTH AFRICA	0800-0900
·	1100-1400
NORTH EUROPE USSR	0700-0100
MIDDLE EAST	1200-1500
AFRICA (ALL)	1500-1800
S. E. ASIA	0800-1000
FAR EAST	1900-2000
S. PACIFIC, NEW ZEALAND	0800-0900
•	1800-2000
AUSTRALASIA	0700-0900
•	1500-1700
CARIBBEAN, CENT AMER.	0700-0900
MCMURDO SOUND	1900-2100

21.0 - 21.45 Mhz. The long awaited increase in Cycle 21 has now arrived. This will start acting like a DX band. It will close sooner than 20 but it will be plenty hot. From sunrise, let it peek over the horizion, to sunset you will be able to work anywhere in the world. Europe before the sun is overhead, move south around noon to S. America, and then mid afternoon the Pacific, Australiasia, Far East, New Zealand, And McMurdo Sound. It should be good on the 13th thru the 16th, 20-21, 29-30. Watch out for a fluwe condition on the 9 th., & the 15th of the month. Anything can happen on those two days.

CENTRAL EUROPE, SOUTH AFRICA	0900-1.100
WESTERN AFRICA	1200-1500
SOUTHERN AFRICA	1100-1300
SOUTH PACIFIC, NEW ZEALAND	1430-1630
AUSTRALASIA	1600-1700
CARIBBEAN, CENTRAL AMERICA	0800-1700
CENTERAL SOUTH AMERICA	1400-1600
MCMURDO SOUND	1500-1600

28.0 - 29.5 Mhz. Ole Sol is beginning to cooperate with you. His activity will be high enough for fairly good openings. It is a daytime band, N.-S. best bet, South America, Africa, Australasia, S,. Pacific, most likely. Europe may pop in now and then. Start looking for low power AM signals from California, CB/10 boys are getting active. You contest boys- I would keep a jaundice eye on this band, it could open up and be terrific, but if that radio storm happens, and I am predicting it will, expect the band to be dead (Oct. 15) But come Oct. 29th, looks good. Don't give up, the way the Solar Flux index is going up and the K index is staying down, the band is going to improve, and rapidily.

WESTERN AFRICA	1200-1300 8	2 1630-1800
S. PACIFIC, AND NEW ZEALAND	1300-1500	
CARIBBEAN, CENT AMERICA	1000-1200	
CENTERAL, WEST S. AMERICA	1100-1600	

50 -5h Mhz. Hey Ray, you are going to get a nice break. Look for some good short-skip sporadic-E propagation during the Auroral activity. The Aurora is going to be fairly active this month. The best I can do for you is these days: 6th, 9th-10th.,& 15th., (this is my storm) 21, 24, & 31.

Another goodie for you Ray, (you lucky dog), the Orionids meteor shower, a major one, will be around for two days, best effect will be early morning of Oct. 21. This will give some fine meteor type openings. You scientific people here is a good chance to test your "Whistle."

Ill - 148 Mhz. Much like 6 meters - There will be some rather ionospheric conditions that will affect two, not often does this happen, but the storm is going to do things. Of course the auroral Propagation applies to this band as well as 6 meters. There are two things to look for: One, watch that TV set, Channel 9 if it comes in go to the rig and go simplex on 145.85 146.52 146.55 146.58 area, mid band. Two storm fronts, they are dying out but these can be good "bounce and slide" fronts. Try a slight tilt on your beam if you have one,,,not more that 15 off horizontal, but a little tilt at this time may surprise you.

SUMMARY: After talking to George (W3ASK) and giving him some of my readings, and then talking to the people out in Boulder, Colo. It looks like Cycle 21 is starting its move up. I counted over 90 sunspots the other day and the Zurich mean is 38.4 for July. This activity should continue and for you contest boys, it looks like a good year for you. The solar flux will run between 70 and 110, very good for now. The K index out of Boulder is running 2-5 and this is good. This sunspot activity is going to boast the MUF and a careful look at October's QST charts will be worth your time. There are some good DX contests this VK/ZL Oceania, RSGB 21/28 and of course the Worldwide DX contest all are going to be in good shape. The static levels on the lower bands are dropping and some real nice signals are starting to come in on those bands.

I have a bet with the boys at Boulder, I'm predicting a radio storm on the 9th, and the 15th. They agree with me on the 9th, but say I am off base on the 15th. Oh well, Hansen my boy, I like Coors.

This management, thanks to WAZVQG Bill Helmetag, will be preferted by none other than Welch, K3CT. Joe, for those of you who might not brow is the local FCC extract. Philadelphia. Joe is quite familiar with the goings om here on this side of the Ever and is coming over for a friendly visit.

So gather 19 111 of your un-answerable questions and we can give noe, a Q & A session. Other than that, lets let him have a good visit.

Communicator License was knocked down, but not entirlely out by the Commissioners in their July meeting because of budget considerations, as proposed. The communicator would become the entry-level license, with element 2 (the now Novice written exam), reoriented to include phone material and the test to be given by the FCC Field Offices.

#### LES BELLES, BY ROSE ELLEN, N2RE

It hardly seems possible that the summer is over; hamfests are behind us and kids are back to school. So, let's buckle down and get ready for cooler days, longer evenings and preparation of different kinds of food that will help us "fill up" on the right fuel. We're hoping our food choices are not split-second decisions like the driver of a racing car: because food selections are important to good health. "TUNA CHONDER" 2½ cups milk, I can cream of celery soup, I can New England-style clam chowder, I 7-ounce can tuna fish, well drained and flaked, I tablespoon minced parsley, Place soups in saucepan; stir in milk and add tuna. Allow to simmer, stirring until thoroughly heated (about 10 minutes). Garnish with parsley and serve hot. Makes 6 - 8 servings. Now that our membership has reached 96 - lets see about making the goal of 100 be another four yls ! We have five at the present time- Myself; Della, Carol, and Bertha plus Ginny... 73's N2RE ROSE ELIEN...