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DECEMBER 1977

C R O S S T A L K

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CROSSTALK IS PUBLISHED MONTHLY BY THE GLOUCESTER COUNTY AMATEUR RADIO CLUB,. EXCEPT THIS MONTH, HAVING MISSED LAST MONTH'S EDITION DUE TO YOUR EDITOR BEING IN THE HOSPITAL.

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CLUB NETS

2 METER FM	78/18	SUNDAY	8:00 PM
6 METER AM	50.9	SUNDAY	8:30 PM
10 METER RAG CHEW SSB	28.8	FRIDAY	9:30 PM
15 METER SLOW CW NET	21.175	FRIDAY	7:30 PM

THE NEXT MEETING WILL BE ON DECEMBER 7th., AT THE NATIONAL PARK MUNICIPAL HALL AT 8:00 PM. LET'S MAKE THIS A GOOD MEETING SINCE IT IS THE LAST OF THE YEAR. DONT FORGET THE SELECTION OF NEW OFFICERS IS PENDING, AND THAT EVERY VOTE COUNTS. IF YOU WANT A CERTAIN PERSON TO WIN A PARTICULAR POST, BE THERE TO ENCOURAGE HIM OR HER, ON. I HOPE EVERYONE HAD A GOOD THANKSGIVING.

YE EDITOR WB2LNR

Usually our time is so taken up with all the things we have to do, day in and day out, that we find it difficult to place priority on other things that ought to be done. One of those other things is taking the time to reflect on what's happening and giving thanks when something has gone right. Of course, this is the time of year (a few days before Thanksgiving Day) when it's not difficult to remember our obligation to give thanks where it's due.

So, my very sincere thanks to:

1. The 102 people who joined G.C.A.R.C. during 1977, launching the club to the highest membership count in its history.
2. The officers and Directors for their interest in the administrative matters of the club during the year.
3. The WORKERS in the club: the Committee Chairmen and Committee members who really did all the work and who are due the credit for the accomplishments the club has experienced. I won't begin to name them because (1) the list would contain the names of at least half the membership; and (2) I would surely leave someone off the list inadvertently.
4. The membership of 1976 for giving me the opportunity to serve as your President this year.

I'm not satisfied with the final results of this year. We did move to a new temporary home; thanks to the efforts of a number of members. We did have a successful Field Day; Thanks to the efforts, again, of a number of members. But so much more could have been accomplished. Someone once said that if you are completely satisfied with the outcome of a job you have been asked to do, you better look back - because you could have done more; or you are not evaluating the results properly.

In any event, the year is over. I have enjoyed my membership in G.C.A.R.C. yet I wish now I could have contributed more during this last year. But that's water over the dam, as they say. The most important thing is: the club will certainly go on. It will go on to even greater accomplishments. And now, we have the opportunity to select our leaders for 1978.

Whoever the elected officials turn out to be, I can assure them there are 102 people who want to see this club progress. Give them jobs to do and the jobs will get done.

My best wishes to the new administration and my sincere thanks to the many members I've had the opportunity to work with this year.

de Herb,  
K 2 H P V ..

P.S.

One last thought for this month: did you know that by joining ARRL through our Club Treasurer Rose Ellen NZRE that \$1.50 of your ARRL membership fee stays in the club. That's right.. Now you can help your club financially by joining or re-joining ARRL through our treasurer. If all 102 members joined ARRL that way next time they are up for renewal, then the club would gain \$153.00.. Now that ain't just hay, my friend; that's a lot of money. In fact, I suggest that the next administration give consideration to reducing a person's Club dues just a little if he or she joins ARRL through the Club Plan.

See you at the meeting in National Park Municipal Building on Wednesday night Dec. 7th, 1977, at 8:00 PM.

RADIO WAVE PROPAGATION  
ART OR SCIENCE  
BY: K2JF  
PART 3

The Tropospheric Wave

The troposphere is the lower portion of the earth's atmosphere. In this region is produced the weather—storms, snow, rain, etc. The portion from about one half mile above the earth up to about six miles is the region of interest to radio amateurs, for it is in this region that the water vapor content of the air varies from a maximum near the earth to a minimum of six miles up or so. The dielectric constant of water vapor is much higher than that of air (taken as unity) and hence will make the dielectric constant of the atmosphere near the earth appreciably greater than that six miles up.

The effect of a dielectric constant that decreases with height is to produce a REFRACTION or BENDING of the space wave that enables it to overcome the curvature of the earth to some extent and thus to act upon a receiving antenna beyond the ordinary line-of-sight. Since a space wave is involved, as is evident from the bending, is important mainly at ultra-high frequencies, where the wave is in the principal mode of transmission.

The bending is relatively inconsequential at frequencies below 28 Mc but provides interesting communication possibilities at 50 Mc., and above.

The bending effect of the troposphere can be taken into account at most simply by assuming that the space wave travels in straight lines, and that the earth is flatter than it actually is, i.e., by assuming that the radius of the earth is about one third greater. Precisely that assumption has been incorporated in the previous chapter; the formula  $D/\sqrt{3}$ , the maximum line-of-sight distance between two elevated antennas.

However the above bending effect does not represent a tropospheric wave, but rather the bending effect of the troposphere upon the space wave component of the ground wave. The TROPOSPHERIC WAVE is assumed to be a wave displaced from the ground wave. It has been found that occasionally quite strong signals can be picked up at ultra-high frequencies considerably beyond the line-of-sight distance. While there is normally some signal in this region owing to diffraction, nevertheless the signal occasionally picked up is much greater than can be accounted for by diffraction alone.

One explanation that has been offered is that occasionally the troposphere is so disturbed that in an upper layer of it the dielectric constant varies so abruptly as to constitute a reflecting, rather than a refracting layer.

If the boundary between the two masses of air is sharply defined, reflection as well as refraction may take place for waves striking the boundary at grazing angles. The more common cause of tropospheric refraction is the temperature inversion. Normally, the temperature of the lower atmosphere decreases at a constant rate of approximately  $3^{\circ}\text{F}$  per 1000 ft. of height. When this rate is decreased for any reason, a temperature inversion is said to exist and greater-than-normal wave bending takes place. Some of the types of temperature inversion are: The Dynamic Inversion, resulting when a warm air mass over runs a colder mass. The Subsidence Inversion, caused by the sinking of an air mass heated by compression. The Nocturnal Inversion, brought about by the rapid cooling of surface air after sunset. and The Cloud-Layer Inversion, caused by the heating of air above a cloud layer by reflection of the sun's rays from the upper surface of the cloud. Sharp transitions in the water-vapor content of the atmosphere may also bring about refraction and reflection of VHF waves.

Frontals, also, are used often as transmission paths. The wave will reflect along the front for many hundreds or thousand miles, normally from the North to the South. One could say the storm front acts like a mirror to the direct wave causing the wave to ride along the water line.

... waves were, being reflected down obliquely into the region of the ... height of the ... rise to the occasional ... This reflected wave is called THE TROPOSPHERIC WAVE. The action is similar to that of ... produce ionospheric or sky waves, which will be discussed in a later article.

Because of ... conditions that produce tropospheric refraction are seldom stable ... of time, the strength of the received signal ... over a wide range. Hourly and seasonal variations are ... often occur in the evening and just before sunrise, and can ... at midday when the atmosphere is relatively stable. ... is generally greatest in the early summer and early fall. It is also more pronounced along the seacoast.

In some parts of the world, particularly in the tropics and over large bodies of water, temperatures increase and pressure decreases considerably as height of the order of a few hundred feet or less. The boundary of the transition is usually well enough defined so that the ... can be "trapped" by the descending layer of air and continually heated ... air layer ... as well as ... are ... the same ... the waves ... of the earth ... a small ... of ... miles. This is often seen in the Gulf of Mexico and may times communication between islands down there are carried on by this method.

#### CONTEST CORNER

December 10-11 AME 10 Meter Contest

January 21-22 And NE Sweepstakes--NOTE: Club competition included. Credit given toward The Megajoint Contest Club.

We're glad to have heard so many of the club members on in the recent contests. We would like to know your score for CrossTalk, and for the club listing in CQ. Please turn in your logs at the next club meeting and we will mail this in for you. If you mail this yourself, let us know your score. Help will be available at the meeting for the first-timers in filling out the logs. We are considering trying something new for the contest participation. Teams of 4 or 5 club members would no more against each other in the contests. The competition would run for the full contest hours, ending perhaps with the winners enjoying dinner at the lounge expense. Let us know if you would be interested in such a competition. Will be be worked out are such details as handicap points for the less experienced operators, etc.

73, N200

FOR SALE.

OH Memory. Small version of the CQ caller type memory we used on Field Day. Contains 2 memories of 255 bits each. Reprogrammable using the built-in keyer paddle. See Norman N200....

Drake TR-4, RV-4, AC-4 built in 348RB factory noise blanker. Excellent condition.. With original factory cartons all manuals and extras \$550.00 Call Ross WA3VVJ.

Several new Beancuts 210, Factory sealed, with warranty cards \$ 249.00 , Call Ross., WA3VVJ

WHEN WE THINK OF COOKING PUMPKIN, WE  
 A NATIVE VEGETABLE OF CENTRAL AMERICA,  
 BY THE INDIANS IN NORTH AMERICA WHO  
 D IN THIS COUNTRY. THE INDIANS  
 N, MADE SOUP, DRIED AND GROUND TO  
 USED AS CORNMEAL TO MAKE BREADS AND PUFFS. COOK  
 CUT PUMPKINS INTO RINGS AND HUNG THEM TO DRY FOR  
 A LONG WINTER.

AS PUMPKIN IS VERY WELL KNOWN FOR ITS CANDLELIGHTED JACK-O-  
 LANTERNS BECAUSE IT'S A GOOD SOURCE OF VITAMIN A AND THERE'S  
 A VARIETY OF DELICIOUS RECIPES THAT CAN BE MADE FROM THIS  
 WHITE GOURD. TODAY, CAN I AT THIS TIME SHARE ONE OF THESE  
 WITH YOU:

#### PUMPKIN COOKIES

1/2 cup shortening	2 teaspoons ground cinnamon
1/2 cup sugar	1 teaspoon baking soda
1 cup cooked pumpkin OR 1 16-ounce can pumpkin	1 teaspoon salt
2 eggs	1 teaspoon ground nutmeg
2 teaspoons vanilla	1/2 teaspoon ground allspice
4 cups all-purpose flour	2 cups raisins
2 teaspoons baking powder	1 cup chopped nuts

In a mixing bowl thoroughly cream together shortening and  
 sugar. Add pumpkin, eggs and vanilla. Beat well. Stir together  
 the flour, baking powder, cinnamon, baking soda, salt, nutmeg  
 and allspice. Add to creamed mixture, mixing well. Stir in  
 raisins and nuts. Drop dough from a rounded teaspoon onto a  
 greased cookie sheet (about 2 inches apart). Bake at 350°, 12 to  
 15 minutes. Remove from baking sheet. Cool. Frost, if desired.

## DECEMBER PROPAGATION FORECAST

1.8 - 2.0 MHz : Night time band. You will enjoy some long sought DX. This band starts to peak about an hour after dark. Look for Europe signals. DX will start. The "D" layer is just about stopped from now till February 15th. Don't look too hard to the South, remember, they are getting summer with all of its QRN. Look for possible Scandianavian, Benelux, and USSR signals. They should start about 2000 to 0230 Eastern time. Remember 160 meters DX is Eastern Sunrise it will diminish with the sunrise. Looks like you "Top Banders" will have a pretty good time for the December 2-4 160 meter contest

Europe	2000 - 0230
So America	2200 - 0111
Alaska, ( Christmas Eve.)	0545 - 0645

3.5 - 4.0 MHz: It is here. Especially around 0100 to 0300. Europe is really no problem. Keep an ear out for F6ARC and ON4UN on 75 phone (3775 - 3800). These signals will start around 2300 and go out to 0230. The QRN is getting down and this aband is going to be a delight to work very arly in the AM.

Europe	2100 - 0230
Africa	2300 - 0100
So America	0100 - 0200
So. West, Mexico	0500 - 0600
West Coast	0500 - 0600

7.0 - 7.35 MHz " Hey Frambes, you can work Europe starting around 1600 and you can even get some Africa and So. America before you go to work. For the rest of us, the Far East, Australasia, South Pacific will be here around Surrise-After Sunrise the band will settle down to its standard operation; but, it will be good at night. After 10, 15, and 20 fold this band will be hot.

Europe	1600 - 1900
(Very Strong)Central Amer.-So. Amer.	2000 - 2100
Australasia	0200 - 0400
New Zealand	0430 - 0530

14.0 - 14.3MHz: Follow the Sun on this band. It will be very good until about 2100 then it goes to sleep. If you want some good DX start early, drop down from 40 and try this deal. Start half-hour after Sunrise, look for Europe; now, as the Sun slowly rises in the East, "...and the clouds come up like thunder" look for Africa from noon on to 1600 then South America, in the early evening, around Sunset, the Pacific and Australasia. Now if you have a beam, around 1700 - 1900, look for McMurdo. A great band for over the Christmas holidays.

USSR-Europe	0700 - 900
Over the Pole So. Amer.	0900 - 1100
Africa	1100 - 1300
So. Africa	1300 - 1700
So America	1600 - 1800
Far East	1800 - 1930
Antartica	1730 - 1900

21. - 21.45 MHz: Well Bill you got your 8-5 band. Here it is in all its glory. If you don't take advantage of it on the 7th, 23rd, and 29th don't growl at me. These days will be away above High Normal. As a matter of fact I may take a day's vacation on Wednesday the 7th it is going to be so good. This is your day time band. It will get better during the winter, but will be a little shorter each day until the 23rd, then it will start to give us some longer days. Let's take a look:

Europe	0900 - 1100
Africa-Middle East	0900 - 1100
So. & Western Africa	1200 - 1400 ( Madagascar (5R8)
So. America, Oceania	1400 - 1600
Australia, New Zealand	

28.0 - 29.5 MHz: Ken, Sorry you work during the day; but, can't help you at this time. This band is the same as 15 meters, Do as 15 but start one hour later, and it will die about one hour sooner. It will be hot when it opens. Good band- Couple of not so good days 4th, 9th, 12, 19, 28, On Dec 10 & 11, anything can happen, especially on the 10th. If the spots are above the solar equator OH Boy Joy today; if below--be like Omar crawl into your tent and go to sleep. For areas see 15 meters.

50 - 54 MHz: What do you want Ray-Bloou. I'm going to give you a couple of meteor showers just because I like you. The Geminds a real dilly of a shower will be gin December 12th and last for three days. 2200 December 13th max. The later one the Ursids December 21-22, 1300 on the 22nd. But Ray, I've been holding back on you. The High E ~~later will come into~~ play this month. It will start around December the 15th and run through Christmas, now that is my Christmas present to you. It will be good for 800 to 1500 mile hops. It will be in the late afternoon 1600 1700. I expect an ionospheric storm around the 11th this ought to work for you.

144 - 148 MHz: Sorry Di Novi, you had your last 2 meter sporadic E for the year in November the 17-19th. nice while it lasted, it wasn't too strong but it was there. All you can hope for now are storm fronts-Cold, ice forming fronts will give you a quick shot in the arm, other than that, try 15 meters instead. Maybe with that 16 element beam of yours you can have some fun with the meteor showers (see 6 meter forecast).

OK gang, that's it for this year. Good DX and have a good winter. Just remember the "boys" down-under are having Summer and all that goes with it including QRN and funny skip. Follow the Sun for 20, 15, and 10; look for storm fronts for 6 & 2 with some activity on 6 around the middle of the month. See you at the meeting.

MERRY CHRISTMAS TO ALL

K2JF



AMATEUR RADIO NEWS FOR NOVEMBER 1977.....  
C.B. ON 220 Mhz., IS DEAD.... Thanks to the efforts of the ARRL and all of it's affiliated clubs and members. " I might add--- A JOB WELL DONE " YE EDITOR..

LAST BUT NOT LEAST MERRY CHRISTMAS, FROM ALL OF US HERE AT G.C.A.R.C. TO ALL OF THE OTHER CLUBS THAT RECEIVE, AND SWAP CLUB PAPERS WITH US. '73's and have have a safe, and Happy Holiday...

RAY MARTIN WB2LNR  
EDITOR..