

**CROSSSTATE - Official Publication of the
GLoucester County Amateur Radio Club, W2MMD
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		Len Davitz, KD2CR	Circulation

AREA NETS

GCAR PTLY NET:	Tuesday,	8:00 PM 147.78/18 Rptr
ARES NET:	Sunday,	8:00 PM 147.78/18 Rptr

Club Repeater s: 147.78/18, 223.06/224.66, 447.10/442.10

General Meeting: First Wednesday of each month at the V.F.W. Hall in Woodbury, NJ. Meetings begin at 8:00 pm sharp.

Contributors: CROSSSTATE, Tony Starr, 611 Franklin Rd., Wenonah, NJ 08090. **Deadlines:** Ten (10) days before each general meeting.

PRESIDENT'S MESSAGE

Dear Club Member

This is a very special Xtalk for me as this is my last one to write as President. As much as I regret seeing the year come to a close, I am just as glad. Serving as President has been a challenge and a great honor.

It has been a year of great accomplishments. The club site is now a reality, thanks to many club members for their support, their sweat and hard work. The electricity is just days from being turned on, the 95 foot tower is being prepared to be raised, the septic system is in progress, the telephone line is in and working, and a new roof has been put on making it leak proof. We have held a few functions on the site already. The next board meeting will be conducted at our Site on November 25th.

Some projects like the scholarship fund and constitution were put into action, but just haven't been completed, they are still being worked upon.

During the year some of the club members had losses in their family, we try to remember in Xtalk to pay respect but sometimes one is overlooked, so my apologies to anyone whose name may have been forgotten.

The Club banquet is now just memories and my feet are still sore from dancing. Virginia Macris (FAZZA) did a fine job setting this affair up, our guest speaker Tom Miller from the ARESL was interesting to listen to, it was a shame everyone could not be there. Congratulations to all those recipients of certificates and awards. Certificates were given to those for their services and dedication to the club through the year: Charley Skotchey (F2EPQD), Mike Lysnitz (N2FK), Al Trueblood (N2FJG), Ray Messer (AL2B), Anthony Starr (W2PZ), John Fisher (K2JF), ED Simek (W2GSN), and Matt Ashton (W2DYS). The W2SDN award was earned by Jim Molluca (K2DWE); the Milt Goldman award is proudly

displayed in the home of Ray Martin (WB2LNR); A Gold Bagel was awarded to Ken Bozareth (KN2U) for timing out the repeater the most times. The highlight of the evening was the presentation of the 1st "Club Life Membership" to Milt Goldman (K3WIL), who is an original charter member to this club. He has been a dedicated club member for many years, a member who always donated so much and who is a friend to all. Thanks guys for the dedicated service and congratulations.

I also would like to thank all the wives of the Hams in the club who are frequently left behind, when the OM is out helping on a club function. Your undying support and help at club projects and events is very much appreciated by all!

In closing let me say I have truly enjoyed serving the Club and will endeavor to help whenever I can. A new year is about to begin and my best to the new slate of officers.

Respectfully
Virginia Martin (N2FJM)
President

YOU REALLY SHOULD KNOW THIS
Pistachio nuts were dyed red in the 1930's to make them stand out in gum ball machines next to cashews. They are now sold in both their natural white and dyed red states.

Women insist on wearing uncomfortable shoes because high heels make a woman feel more attractive and sexually more interesting.

Juicy Fruit gum contains lemon, orange, pineapple and banana flavors.

You can never eat a fresh sardine because there are no sardines in the ocean. Generic small fish become sardines when canned.

Chicken takes longer to cook than most cookbooks specify because the bird was at room temperature when the authors cooked it.

Cashews don't have shells because a cashew technically is a seed, not a nut. cont'd. P=3**

NAMING THE UNITS

by
David Kirk, KY3J

The listing that follows is not all-inclusive. It is intended to remind us as we use the terms of the human connection behind the word and to make us more aware of personal contributions. These brief summaries can be extended through any good encyclopedia.

AMPERE--Andre Marie **AMPERE** (1775-1836), was a French physicist who pioneered in electromagnetism. His fame rested mainly on establishing the relationship between electricity and magnetism. The ampere is the unit of intensity of one volt acting through a resistance of one ohm.

COULOMB--Charles Augustin de**COULOMB** (1736-1806), was a French physicist and military engineer. Famous for his inverse square law relating forces to charge and distance. ($F = kQaQb/R(\text{squared})$) His name is related to the amount of electric current transferred in 1 second by a current of 1 ampere.

CURIE-- Marie **CURIE** (1867-1934), and her husband Pierre, were French physicists who shared the Nobel prize for the discovery of radium in 1903. Marie then received the Nobel prize in Chemistry in 1911, becoming the first person to have been awarded it twice. Unit of radio activity.

FARADAY-- Michael **FARADAY**, (1791-1867), an English physicist who was the discoverer of electromagnetic induction, the laws of electrolysis and the fundamental relationship between light and magnetism. Unit of capacitance. (Farad)

GAUSS--Carl Friedreich **GAUSS**

(1777-1855), A **Gauss** mathematician to whom history has accorded a place with Archimedes and Newton as one of the greatest mathematicians of all time. Although he conceived almost all of his fundamental mathematical discoveries between the ages of 14 and 17, he did not get involved in basic research in electricity and magnetism until 1833. Unit of magnetic induction.

HENRY--Joseph **HENRY** (1797-1878), was a U.S. physicist who at the age of 13 was apprenticed to be a watchmaker. He was the first to insulate wire for the magnetic coil and he invented spool winding. In recognition of his discovery of self-induction the International Congress gave his name to the standard unit of inductive reactance. He taught at the College of New Jersey (later Princeton) and in 1846 became the first secretary of the Smithsonian Institution. Unit of Inductance.

HERTZ--Heinrich Rudolph **HERTZ** (1857-1894), A German physicist, was the first to demonstrate the production and reception of radio waves. He then established the electromagnetic nature of light. He was professor of physics at the University of Bonn, dying at 37. Unit of frequency.

MAXWELL--James Clerk **MAXWELL** (1831-1879), was a British physicist who was working on his scientific toys before he was eight. His reading of Faraday's work marked his entrance into the study of electricity. He confirmed experimentally that the velocity of an electric current through a wire is about the same as the velocity of light in space (3×10 to the 8 m/s). Unit of magnetic flux.

NEWTON--Sir Isaac **NEWTON** (1642-1727), was an English physical scientist and mathematician, one of the greatest figures in the entire

history of science. He did equally important work in optics, light, gravitation, and astronomy as well as thermodynamics, for which the unit of force was given his name. Unit of force ($F=ma$).

OERSTEAD--Hans Christian OERSTEAD, (1777-1844), was a Danish physicist and chemist, the discoverer of electromagnetism. During an evening lecture in 1820 he discovered that a magnetic needle was deflected by an electric current. The importance of this was rapidly recognized and he was honored as one of the great physicists of the age. Unit of strength in a magnetic field.

OHM--George Simon OHM, (1787-1854), was a German physicist whose important contribution was Ohm's Law of electric conduction. Initially the work was coldly received and he resigned his post as professor of mathematics at Cologne. Later he was awarded the Copley medal of the Royal Society in 1841 and was made a member. Unit of resistance ($V=IR$).

RONTGEN--Wilhelm Conrad RONTGEN (1845-1923), was a German physicist who received the first Nobel Prize for physics in 1901 for his discovery of X-rays. While experimenting with an exhausted vacuum tube on the conduction of electricity through gases he observed the fluorescence of a barium screen that happened to be laying nearby. Since he was unsure of the nature of this light he called it X-ray. Unit of X-ray.

VOLT--Alessandro Giuseppe VOLTA, (1745-1827), an Italian physicist and pioneer in electrical science. In 1801 Napoleon called him to Paris to show his experiments on contact electricity and had a medal struck in his honor. In 1815 the Emperor of Austria made him director of the philosophical faculty of Padua. Unit of potential difference.

WATT--James WATT (1736-1819), was a Scottish engineer, the inventor of the condensing steam engine. The name is synonymous with units of power. Although no reference to direct work with electricity could be found, his unit is represented by the current of one ampere (one coulomb per second) under a pressure of one volt. An English horsepower is approximately 746 watts. Unit of power. ($P=VI$).

You get white wine out of red grapes because no matter what color the grape is, the juice it produces will be yellowish white.

The polyurethane used to line paper mill cartons adheres easily to itself, thus making the cartons hard to open.

There are, of course, baby pigeons. They quickly grow to be about as large as their parents, from which they are all but indistinguishable. (Tnx various sources K2JF)

In an unprecedented action, the FCC has notified all Volunteer Examiner Coordinators (VEC's) with amateur radio operator testing teams in the Caribbean that it no longer will accept the services of a ANY accredited volunteer examiner in VEC testing Region 12. All amateur testing operations were ordered suspended effective immediately. Citing generally high pass rates Kowalski, Chief, Special Services Division, said the Commission was very concerned about volunteer amateur radio operator testing in Puerto Rico. While the total number of individual U.S. amateur operators has increased less than 3-1/2% since January 1986, the Puerto Rican amateur census during this same period is up nearly 50%. Tnx W5YI/K2JF.

ATTENTION ALL WHO WISH TO BECOME AMATEUR EXTRA CLASS
The new Extra Class pool of questions will be released on March 1, 1988. So if you have the present one's memorized you better take your test soon. K2JF

PART 5

Regular Variations of the Ionosphere

GENERAL-- Since the existence of the ionosphere is dependent on radiations from the sun, it is obvious that the movements of the earth about the sun, or changes in the sun's state of activity which might serve to cause an increase or decrease in the amount of its radiation, will result in variations in the conformation of the ionosphere. These variations include those which are more or less regular in their nature and, therefore, can be predicted in advance, and the irregular variations resulting from the abnormal behavior of the sun. For purposes of discussion, the regular variations may be divided into four classes, the Diurnal or daily variation, the seasonal, the 11-year, and the 27-Day.

DIURNAL: (variation with hour of day-K index) F layer height and density decrease at night. E layer height approximately constant, density follows vertical angle of sun. Practically nonexistent at night. D layer--appears after dawn. Density follows vertical angle of sun, disappears at night.

SEASONAL: F2 layer--height increase greatly in summer, decrease in winter. Minimum predawn density reaches lower value in winter.

11-YEAR: Sunspot cycle. Layer density increases and decreases in accord with sunspot activity. Unsettled to active conditions will exist during rise--(we are starting in the increase of cycle 22 -- now underway).

27-DAY: (SUNSPOT)-- Recurrence of SID's (Sudden Ionospheric Disturbances) and ionospheric storms at 27-day intervals. Disturbed conditions frequently may be identified with particularly active sunspots whose radiations are directed toward the earth every 27 days as

the sun rotates.

DIURNAL--For most part, the diurnal variations and their effects upon the ionosphere layers tell us that to compensate for the resulting variation in the skip distances, it is suggested that higher medium frequencies be used during the daytime, and lower medium frequencies at night. The reason for this appears in the fact that the ion density of the F2 layer is greater during the daytime, and will reflect radio waves of higher frequency than the F layer will reflect during the night. The higher frequency waves suffer less absorption in passing through the E region, whereas at night the appearance of the D region permits the use of lower frequencies.

SEASONAL--As the apparent position of the sun moves from one hemisphere to the other with corresponding changes in season, the maximum ion density in the D, E, and F1 layers shift accordingly, each being relatively greater during the summer. However, the F2 layer, however, does not follow the pattern in seasonal shift. In most localities, the F2 ion density is greatest in winter and least in summer, which is quite the reverse of what might be expected from simple theory. (I will not venture any further into this now).

FIVE YEAR that sunspot activity varies according to an 11 year cycle has been known since 1801. Shortly after the discovery of this phenomenon, a method was devised for measuring the relative intensity of sunspot activity, and, by means of this method, the alternations from maximum to minimum have been followed closely through the years. Recently, the method entails the use of the so-called WOLF sunspot number, a number obtained for each day by multiplying by 10 the number of distinct visible sunspot groups and adding thereto the number of

NEW ZONE 23 DEFINITIONS:
J11,UA0Y,BY3G-L,BY9A-F,BY9G-L,BY9
Z,ALL BY0

NEW ZONE 24 DEFINITIONS:
BV,CR9,BY1,BY2,BY3A-F,
BY3M-S,BY3T-Z,BY4,BY5,BY6,BY7,BY8
BY9H-S.

individual spots observable in the groups. The increased activity at times of sunspot maxima is reflected in an increase in ion density of all the ionosphere layers, resulting in higher critical frequencies for the E,F1 and F2 layers, and higher absorption in the D region. This permits the use of higher frequencies for communication over long distances at times of sunspot maxima than would be usable at time of sunspot minima (watch 15, 12, 10 and 6 meters group as we get further into this cycle).

TWENTY-SEVEN DAY: Another cycle is the 27 day variation resulting from the rotation of the sun on its axis. As the number of sunspots changes from day to day with solar rotation or the formation of new spots or the disappearance of old ones on the visible part of the sun, absorption of the D region also changes. Similar changes are observed in the E layer critical frequency. These variations exhibit wide geographic range; they are not effects that are observed at one station and not observed at others. Because of the variability of the F2 layer, precise predictions of its critical frequencies cannot be made for individual days, although seasonal and long-term trends and geographic distribution may be outlined accurately in advance. It is necessary in selecting frequencies for long-distance communications (DX) to allow for these fluctuations.

The next section will be on irregular variations of the ionosphere. K2U

Congratulations to: Mirian Kravitz, Jeff Marder and Charles Bastow for passing their Novice exams. Now let's all get that Tech ticket and let us hear you on 10 meters. Go at it.

THE FIRST "VOICE OF AMERICA"

The first radio signal to span the Atlantic took place on December 12, 1901, when a series of telegraphic "S's", transmitted from England, were heard at Signal Hill, Newfoundland. Few know that this remarkable feat was really scheduled for America.

WGYI was recently on vacation in his home state (Massachusetts - his original call was W1NTK) and this is his report. He had an opportunity to visit what was to have been the receiving site of the first trans-Atlantic wireless transmission from England by Guglielmo Marconi... South Wellfleet, on Cape Cod.

The timbers from the high wooden towers are still there-protected by the U.S. National Park Service in the Cape Cod National Seashore. Some are under water now since Cape Cod is slowly eroding away at the rate of three feet a year. contd p 7 ***

Hey you Contesters or How about trying Contesters, here are some real good ones to try in December.

Dec. 4-6 ARRL 160 Meter Contest...You low band fellows can try it. Perhaps the Site may be ready ???

Dec 5-6 TOPS 3.5 MHz Contest...Another for you low band guys

Dec 12-13 ARRL 10 Meter Contest Hey Novice and Techs. Here is your big chance to do some real contesting." Go at It."

Jan 2-3 "73" 10 Meter 55b

Champ..Another" Go at it.

The above contests are really good "breaker-iners" and when you get yourself adjusted why then you can really "Go at it" when the ARRL and CQ, Phone and CW contests come up. Last month Nov.21-22 you Novice and Techs. had a chance to go for W.A.S when the ARRL SSB "Sweep-Stakes" was up. You don't want to miss these now for getting the "Close-in" states on 10 will be getting more and more difficult as the Cycle 22 keeps rising. For you people who are trying for SBWAS, a word to the wise should be sufficient. K2JF

Information---For any one starting out or wishing to learn about the basic principles of Electromagnetic Transmission (big words on Radio signal transmission) the two articles by Lew McCoy titled "Getting the Signal From Here to There" Part I and II are in the October and November 1987 issues of CQ. These are very good articles and I recommend them to anyone interested. As Amateur radio operators it behooves us to really understand how your signal gets from "Here to There." K2JF.

DX

Well as has been predicted the bands have been wide open and the Ten meter band has been jumping all over the place. I hear a couple of our YL's in there really putting in an effort to make DXCC. With the oncoming of the winter months, here is you chance to go after the Top band, 3.5 MHz, and 7 MHz, DX. Remember these are the bands to really work during the winter months when the noise level is down (No thunderstorms in the area). Most of the DXer's in the Club are awaiting their cards from the Andaman operation VU4GDG, and the new (we hope) country SPSA/D. Ken ZL1AMO has left Cocos-Kelung, but a new bunch are there. We

are awaiting news of Ron's departure to Auckland-Campbell. Some of the good stuff coming up is SR Madag, near SKRVE Kon 21023 at 1900, Deserted Island NJ7D/KPS. In the "wish it were true" department there has khas been reported Afghanistan YA by the Russian station UB5TCF/YA and YA1AP daily on 14170 at 1930..well all I can say is WFWL. Now that the Sun-Spots are getting hotter don't forget the new 12 meter band. Remember contacts here count for DXCC credit but donot count in contests. The band has been doing fairly well. Here is an example of some of the stuff I have worked: 100QDV 24955, IV3IRO 24960, PF2ZZD 24951, BV4BD 24940; so take a look and see what you can do. You don't need high power, all the above were worked with 100 watts with my sloper antenna.

So gaud "Go at it" and look some of this DX. Who is going to be the next person to get DXCC in our group? Which one of you YL's are going to do it? C U in the File-ups. K2JF

87-14, PRB-3 UPDATES

The Commission is now in the process of reading and digesting the many thousands of comments it received concerning 87-14, the FCC proposal to REMOVE the bottom 2 MHz of the 220 band FROM amateur service. Due to the sheer volume of comments, as well as the oncoming holiday season, FCC action on 87-14 is not expected until January or February at the earliest. The Docket could also be further delayed by Commission's concerns on the FCC. Tax Aids letter.

ORION INDUSTRIES FINED \$940,000

Orion Industries, Inc, of Las Vegas, Nevada, and its owners have been fined over \$940,000 for importing and marketing illegal radio frequency devices. In addition, one owner was sentenced to two years imprisonment.

since Cape Cod is slowly eroding away at the rate of three feet a year.

After Heinrich Hertz demonstrated the existence of electric and magnetic waves, Marconi began dreaming of a way to send messages from transmitter to receiver without the aid of wires. In 1894 he was able to detect an electric wave 30 feet away - in 1895, it was one mile. Using more powerful equipment it was ten, then twenty, then fifty miles. By 1901 a 200 mile range was achieved. Wireless telegraphy became the rage of Europe ...then America. Marconi thought magnetic waves could leap the ocean! The great American electric inventor, Thomas A. Edison, said it was impossible!

South Wellfleet, Massachusetts, jutting out into the ocean on the arm of Cape Cod, was selected by Marconi as the western-most tip of America. It offered an unobstructed straight line path to Poldhu on the English coast where, in 1901, Marconi had constructed a powerful station. Marconi paid \$250 for eight acres of otherwise worthless Cape Cod land now worth millions!

The South Wellfleet station was modeled after the one in Poldhu, England. A circular series of twenty 200-foot ship's masts were planted in the sandy soil about 165 feet from the ocean. Then disaster struck. The circular ring of towers in both England and South Wellfleet blew down in storms. Each tower pulled the next one down. The Poldhu antenna was replaced with a "V"-shaped aerial between two salvaged 150-foot masts.

The western leg of the trans-Atlantic experiment was then transferred from Cape Cod to St. John's, Newfoundland. It was pre-arranged that the three-dot Morse code signal would be transmitted from Poldhu starting December 11, 1901. The following day it was heard! What Thomas A. Edison said was impossible had been accomplished - magnetic waves could span the great oceans!

To Marconi's dismay, a Newfoundland cable company had exclusive communications rights. Four days later, Marconi was served with a Cease and Desist Order and required to vacate Signal Hill. The Canadian

government offered Marconi another site at Glace Bay, Nova Scotia.

A new set of four (210 foot high) towers was constructed at South Wellfleet in 1902. On January 18th, 1903, Marconi himself tapped out a telegraphic message that was to have been relayed to England through Glace Bay. All involved were stunned when the reception acknowledgement came direct from Poldhu, England!

The message was greetings on behalf of the American people from President Theodore Roosevelt to His Majesty, King Edward VII. A return message to the president from "Edward R. & I" was received. The texts of both messages made the front page of the New York Times. The age of two-way communication between Europe and the New World had begun.

From that day forth, European news was relayed to the New York Times through Cape Cod. Ocean-going vessels adopted Marconi's apparatus to receive news broadcasts. Business and social messages could be sent to Europe for fifty cents a word.

Local Cape Cod residents could hear the crashing spark some four miles away. Telegraphers operating at 17 words per minute manned the Cape Cod station for some fifteen years when, due to erosion and threatened by collapse, the station closed, never to reopen. Old "CC" was replaced by "WCC" in Chatham, Massachusetts in 1920.

The QCWA has installed a replica in the National Park Service Headquarters building at South Wellfleet of the original spark gap transmitter which made the historic first two way trans-Atlantic radio contact. If you visit Cape Cod, we recommend you look up what is one of the nation's little known historic landmarks ...Station "CC" - the first "Voice of America."

Much of the information for this piece came from park historian Michael E. Whatley, of the Cape Cod National Seashore, who has spent years researching and writing the Marconi/Cape Cod story. We enjoyed sharing it with you. See you in two weeks.