

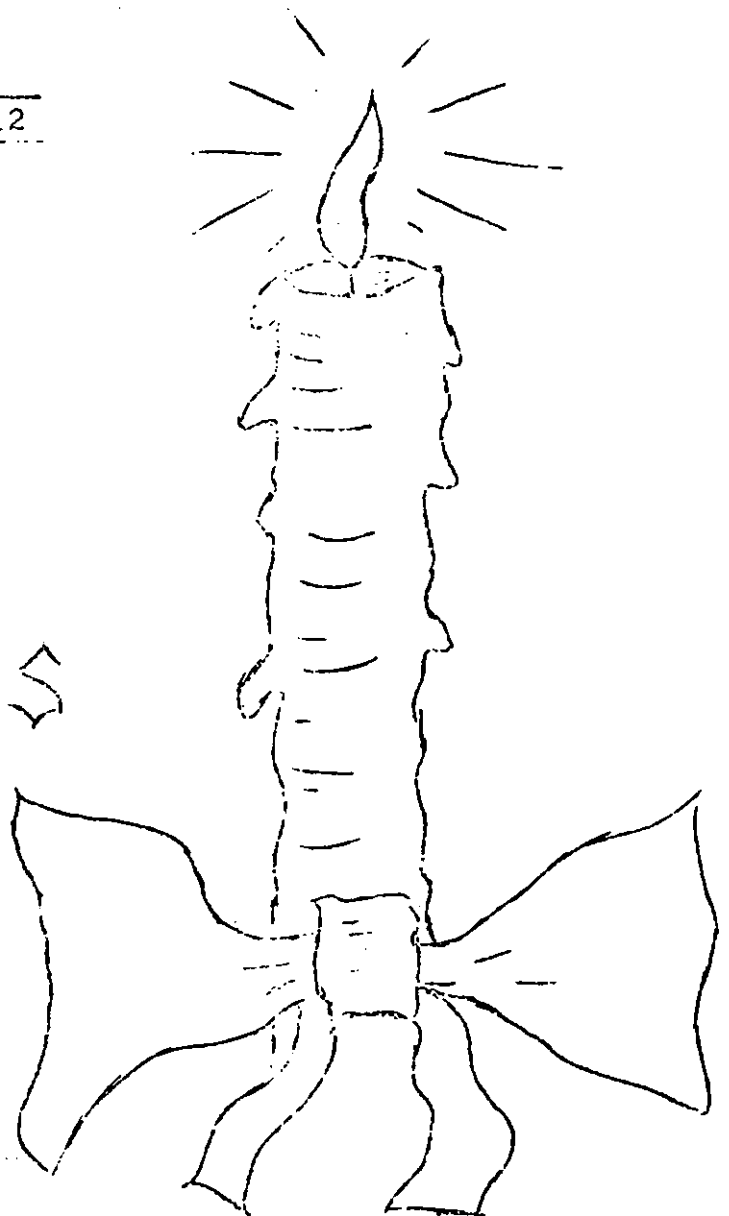
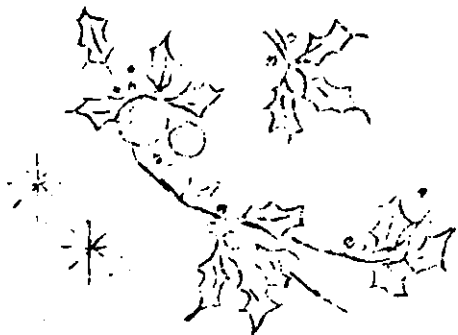


CROSSTALK

DECEMBER 1965

VOL. 7 NO. 12

Seasons Greetings



BOOK REVIEW.....

THE BIRTH AND DEATH OF THE SUN

This book, as some of the others that have been reviewed in the pages of CROSSTALK, does not pertain to amateur radio, but no doubt the inquisitive mind of the average ham will find the information contained in this publication very informative, and interesting. The Birth and Death of the Sun offers a lucid explanation of Stellar evolution and atomic energy.

One of the more interesting chapters is devoted to the question of wheather our Sun, will follow the course of many of the other stars (suns) in the universe and eventually burn itself out. One interesting aspect of this theory is that before this can happen the Sun will go through the normal cycle of evolution and over a period of 10,000,000,000 years will gradually increase in luminosity until the heat reaching the earth will be 100 times it's present day amount.

Another chapter is devoted to the question "Can Our Sun Explode?" and deals with the phenomenon of novae and super novae. (explosions and super-explosions of stars)

If nothing else, the reader is sure to be impressed with the vastness of the known universe as explained in the book. The Milky Way, of which our solar system is a part, consists of about 40 billion stars similar to our Sun, and is 100,000 light years in diameter. A light year is 5900 billion miles! To complicate matters the Milky Way is only one of many similar Galaxies known to exist.

A MENTOR BOOK by George Gamow

HAM RADIO ON TV

For a change, Ham Radio has appeared on television not in the form of TVI!

On October 26th, WKBS-TV channel 48 devoted about five minutes of their 5:30 News Reel to Ham Radio. The occasion was the operation of K3UN in Gimbel's Cheltenham during United Nations Week. The operators of K3UN briefly explained the purposes of Amateur Radio and demonstrated the operation of the equipment.

CB RADIO GETS 60 MINUTES ON TV

Not to be outdone...the October issue of Popular Electronics says that WREX-TV in Rockford Illinois devote 60 minutes to CB Radio recently. Maybe they could be forced to give ham radio equal time under sec. 3.17 of the communications act! It says stations shall afford those with opposing viewpoints equal time!

BE SURE THAT BRAIN IS OPERATING BEFORE PUTTING MOUTH IN GEAR!

AREC COOPERATES WITH LOCAL POLICE

The Gloucester County AREC cooperated with the West Deptford Township Police Department during the Halloween season to scare off any would-be goblins! Jim Peck W2LVW, EC for Gloucester County reported that 5 mobiles and a fixed station were placed at the service of the police department for several evenings before halloween. A reserve police officer rode in each of the mobile units.

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CROSSTALK.....

is the official publication of the Gloucester County Amateur Radio Club, Inc. The deadline for the submission of material for publication is the 20th of the month. Any material contained herein may be republished provided proper credit is given.

EDITOR

Jack Layton K2JKA

PUBLISHER

Clif Brown WA2KGD

CIRCULATION

Sid Gantz WB2JRU

* Member Amateur Radio News Service

MEETING NOTICE

The regular monthly meeting of the Gloucester County Amateur Radio Club will be held on Wednesday evening December 1st at the Atlantic City Electric Company (2nd Floor), 7 South Broadway, Vinman, New Jersey. Starting time is 8 PM. Visitors are always welcome, members are urged to attend. This is a very important meeting, on the agenda for this evening are: (1) nomination and election of officers (2) a discussion of the possibility of raising dues (3) important information on the new meeting room.

PLEASE NOTE THE CHANGE IN MEETING PLACE. JUST AROUND THE STREET FROM THE VINMAN POLICE STATION.

de K2JKA

First off, apologies to those of you who received CROSSTALK late last month. Sometimes I wonder about the Post Office Department. Earlier this year ye-hon-sd took a lot of time to rip code all of the address labels in hopes that we would get a little better service (as per the P.O. Dept.) Later on we started to use pre-cancelled stamps thus saving Uncle Sam time in canceling! CROSSTALK was mailed on time (one week before the meeting) and yet some of you didn't get it till the week after the meeting. What happened I don't know... but here's hoping that this issue gets to you on time.

This month marks a milestone for the CROSSTALK staff; this issue being number 25 from the JKA pen and the KGD press, also last but certainly not least is Sid WB2JRU who has taken care of the stamping, stapling and folding of the paper for almost two years now. There will be a few changes forth coming as we are about to loose our pressman Clif; the BK will be making for a few more issues, but that til April when we will acquire

Don't forget to
ask for news in CROSSTALK
even if you don't

THE NEW COVER

ZERO BEAT

By Doug DeLor W8HHS
Editor W1FER

Being properly licensed to operate a ham station, having a clean signal and remaining within the confines of prescribed frequency boundaries as set forth by the FCC, is not always sufficient to make you completely "legal" with regard to Federal laws.

The improper use of call signs by even the most seasoned operators is startling, to say the least. Although citations are less frequently given on the VHF and UHF bands, (due to limited propagation and the lack of QSO's) improper call sign usage is the mark of a "sloppy" operator.

Phonetics are legal...only if used correctly. They are unnecessary for the most part and should be used only in instances where readability is a problem. The prescribed manner is to give the other station's call sign first and your call sign last. e.g. K7AAD, this is W8HHS calling... or, K7AAD, this is W8HHS standing by. Under difficult conditions it is acceptable to say "W8HHS, this is K7-Able...Able...Deg, K7AAD, calling and standing by." It is not only foolish to spell out the other fellow's call letters, it is unnecessary. After all he knows what HIS call sign is! Yet, station after station uses phonetics (sometimes rather juvenile at that) when giving the other fellow's call as well as their own. If phonetics must be used, your call sign must be given as K7AAD just prior to standing by. Your call sign must be the last used following any transmission. It is ILLEGAL to put your call sign first and the other station's last. e.g. "This is W8HHS calling K7AAD and standing by." Yet you hear this being done time and time again on the bands. An A-1 operator would not be guilty of such practice.

Another highly illegal but frequently practiced "technique" is carried out by the "radio-ple" operators. He can be heard to say (using

his call sign), as he reads by, "W8HHS this is K7A-d and a D. He might be heard saying this "W8HHS, here is K7 'Awfully Awfully Delightful' calling," or some childish thing. It is ILLEGAL as well as being characteristic of "ludism." There seem to be guys who lie awake at nights thinking up silly phonetics for the call signs of fellow hams. This sort of thing is OK for the club "smoker" or ham picnic, but has no place on the air.

The other fellows call must be used in it's entirety too. I've had a number of fellows who know my call sign as well as their own, who insist on coming back to me with, "SHHS (or W8HS) this is K7AAD." Loren's and my call signs used only as examples in this text.

In qualifying for a ham license, knowledge of proper call sign procedure must be proven. Why then do these violations continue? Amateur Radio is a serious pastime. The same skill and effort used in propagating a DE signal should be exercised in maintaining good operating habits. Fun and games have no place on the air if you consider yourself a serious amateur operator.

Smut and vulgarity have their place too...but not on the air. I was in a net for a year once (in another call area) and one of the net members had a call sign ending in HPV. He insisted on saying "this is W....I-Pee-Vigorously." In reality he was the only net member that was amused by this. I have heard suggestive phonetics much worse than this too...and used on the air.

A little serious effort to clean up our operating habits will keep all of us legal, create better world wide images of American amateur radio, and give us the satisfaction of knowing we are not LIES.

The human brain is wonderful. It stays working the moment you get up in the morning, and doesn't stop until you greet the FCC examiner.

YELLOWSTONE AMATEUR RADIO CLUB

THE HOW AND WHY SECTION
DEVOTED EXCLUSIVELY TO
TECHNICAL MATERIAL

$$g \approx R = P$$

SPECIAL



$$E \frac{1}{L} = R$$

$$T = CR$$

$$L = \frac{E}{L}$$

CROSS TALK

$$\frac{Z_{in}}{Z_0}$$



$$X_L = \frac{RR}{X_C}$$

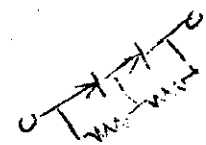
$$T = \frac{L}{R}$$

BONUS

$$C_{in} = C_{4k} + C_{9k}(A+1)$$

$$C = \frac{KA(n-1)}{d}$$

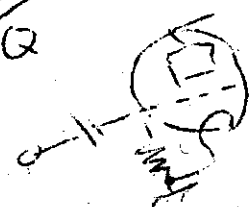
$$L_T = L_1 + L_2 + L_3$$



$$X_C = \frac{R}{Q}$$

PAGES

$$2\pi fR$$



ABOUT ANTENNAE

written for CROSSTALK by
Jim Peck W2LVW *

Now that we have gotten over the hurdle of DB and power gain/loss without losing too many of you, I hope, (and you've had a month to digest it) let's continue with this talk about antenna gain, which is what we all are so much interested in. How do we get antenna gain? Well, there are only two approaches to antenna gain:

1. Increase or multiply the power or intensity in the antenna so that the antenna radiates the same pattern shape with greater intensity. (Remember my thoughts about the economics of amateur radio? This is the hard and expensive way)
2. Change the shape or pattern. Since we don't need radiation in all directions at all times, we can increase the intensity by changing the shape of the pattern to put the radiation in the direction we want when we want it.

Basically this is done by using an antenna which utilizes the same amount of power; but now the pattern will be shaped to give us the desired directivity, the same as a water sprinkler we use on our lawns. (How come we can do it on a lawn, but can't do it with antennas?) There is so much water coming out of a given hose. If we apply the hose to a rotating sprinkler, we distribute water in a given circle. If we change the head of the sprinkler, we cover a different amount of area with the same amount of water still coming out of the hose. So, how do we get more gain out of an antenna? Well, remember that fat donut we were talking about? Well, now comes the time for us to start flattening it out a bit. Just look back in the November issue at the drawing and try to imagine what would happen if you put the palm of your hand on the donut and squashed down on it? Well, if this was your radiation pattern, you would increase your range. Well, we can't go up the tower and squash down on our antenna, so we have to have a solution other than that one.

To get antenna gain for amateur use, we will skip over the vertical type of antennas and use horizontal antennas, as this is the type mostly used by amateurs. We first have to use a couple of new words here.. "in phase and out of phase." Well, about all we have to know about this is that if you stuck two half wave dipoles out of your window and fed the same amount of power to each one of them using the same amount of line to each antenna, then the signals leaving the antennas would leave at the same point in time and arrive at a friend's house at the same point in time and this would be in phase. These two in phase signals would, in effect, give him a stronger signal at his receiver and give you an apparent gain. Now anything else not being equal, meaning if one of the cables was longer or shorter, or anything else affecting the timing of the signal, would be considered as being out of phase and at the other fellow's hamshack he would get the difference between the two signals, and this would be less than optimum. Keeping this in mind, and also keeping in mind the fact that in order to change from the vertical to the horizontal radiation patterns all you have to do is mount the antenna in the desired position, an explanation will be attempted as to how gain is derived from antennas. Remember that antenna gain cannot be generated by the use of additional power or anything like this, we have to squash down on the donut.

ABOUT ANTENNAE (contd)

We should remember that a vertical half wave dipole has a circular pattern in the horizontal direction. If we place it in front of a screen, wire mesh, or something similar, then we could no longer radiate in the direction to the rear. This also means that the pattern is no longer circular. We know from theory and experiment that when the half wave dipole is spaced one quarter wave length ahead of this screen or mesh, the radiation which was going to the rear will now be in phase with the radiation going out to the front, and as it is phase it is actually reinforcing this radiation and at the same time forming a lobe at the front, which is call a directional lobe..hence a directional antenna. Remember also, if this half wave dipole is placed in a horizontal direction, the same rules apply. Now we will replace the screen or mesh with an element similar to the one we are using for the dipole, and we now have a two slement beam. We can now say that we have decreased the beamwidth of the antenna or increased the gain of the dipole antenna.

The Yagi Antenna; perhaps the most widely-used directional gain antenna used by amateurs is the so-called Yagi. It has many forms and variations, but generally consists of at least two and usually three to five elements. Each additional element puts a little more of a squeeze on the donut and flattens the pattern out a bit more giving a little bit more gain, directivity, etc. Instead of adding elements at the rear, when we go the three element Yagi, we start putting one in front of the dipole. This is like adding a lens to a flashlight. It focuses the beam pattern and conversly the gain of the antenna. Elements at the front of the dipole are called directors, while the elements at the rear of the dipole are called reflectors, and, at this time, the dipole itself acquires the name of the driven element.

The question now may be raised, now many elements? To increase the gain of a three-element Yagi, we can add additional directors in front of the first one, but there is a limit from the practical standpoint. In order to increase the gain of an antenna by 3 db (remember this means to double the apparent power output), we have to add directors of the proper size and overall length and spacing which effectively double the length of the antenna. This obviously imposes quite a problem at certain frequencies (recall the chart) and restricts the amount of gain we can practically achieve. Adding additional elements also makes the band width and beam pattern so sharp that other deficiencies become apparent. So, an overall judgement must finally be made by the amateur as to just what he wants to accomplish with his antenna. Another method used to increase the directivity and gain of an antenna is to stack arrays. We will not go into this except to mention it here. You must keep in mind that for every 3 db gain you want, you will practically have to double the setup which you now have.

Deviating slightly, but still remaining on antennas, Figure #1 is a chart of circuit analysis equivalents which has been in my possession for a number of years and is not readily available at one time and in any one place. This applies primarily to transmission lines, but can also be applied to antennas. The explanation is for one cycle, but you must keep in mind that what applies to one cycle applies to all other cycles. The conditions shown will explain the presence of currents or voltages at any given point on an antenna or a transmission line at any given point at any time and also whether the circuit is capacitive, inductive, or resistive at any given point at any given time. This applies to any frequency, but becomes more apparent the higher you go in frequency.

Here are a few examples on how to make use of it...

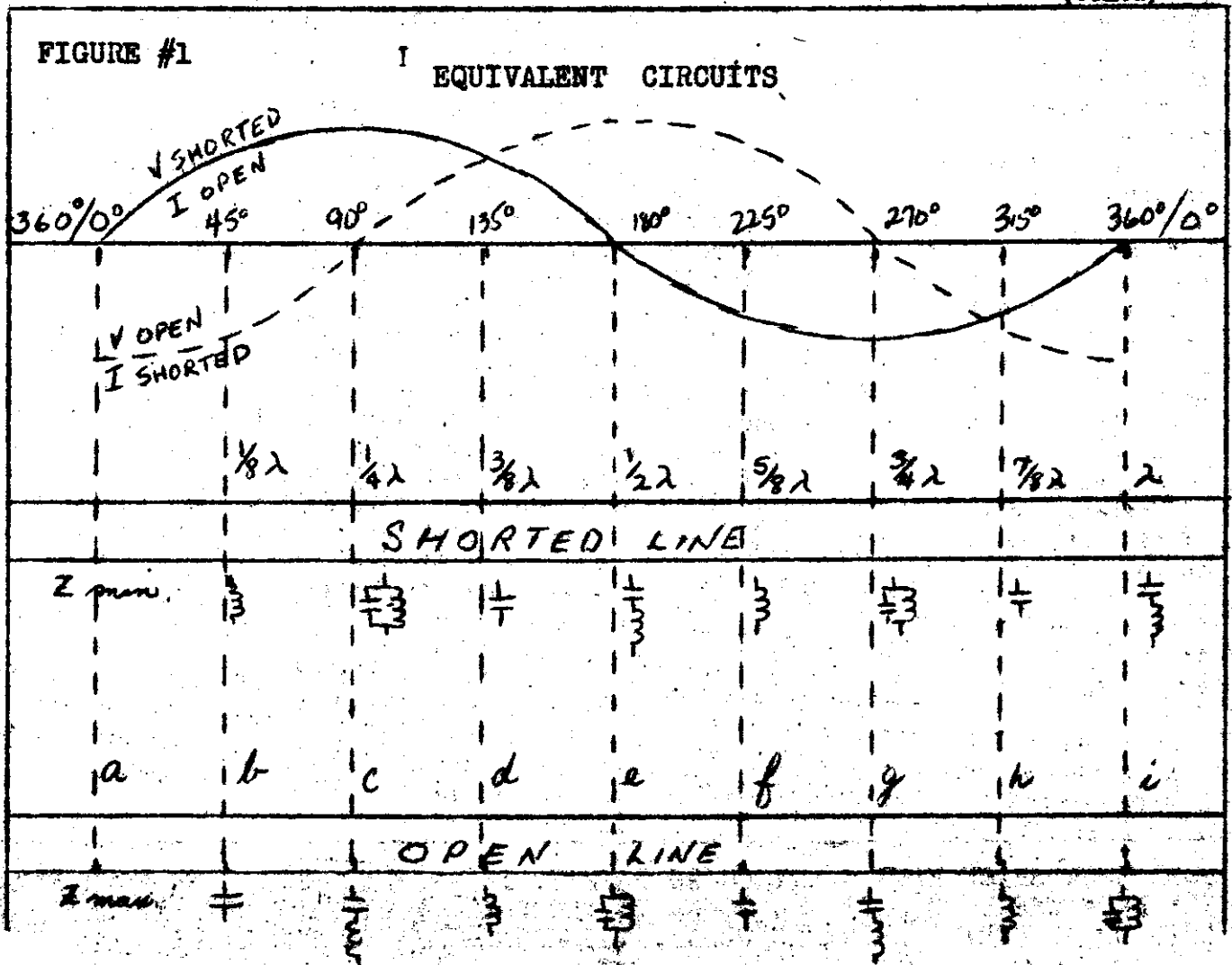
DOES YOUR SHACK HAVE A SWITCH TO SAFETY? IN AN EMERGENCY DOES YOUR FAMILY KNOW WHERE TO SHUT ALL POWER TO THE RADIO EQUIPMENT OFF? IF NOT LETS DO SOMETHING ABOUT IT TODAY....TOMORROW MAY BE TOO LATE!

ABOUT ANTENNAS(contd)

Assume we have:

	THEN ON THE SHORTED LINE WE WOULD HAVE	ON OPEN LINE
Condition "A"		
Zero degrees	<ol style="list-style-type: none"> 1. Minimum impedance 2. Minimum voltage 	<ol style="list-style-type: none"> 1. Maximum impedance 2. Maximum voltage
Zero wavelength	<ol style="list-style-type: none"> 3. Maximum current 	<ol style="list-style-type: none"> 3. Minimum current
Condition "B"		
45 degrees	<ol style="list-style-type: none"> 1. Voltage and current are nearly equal 2. Impedance is of intermediate value. 	<ol style="list-style-type: none"> 1A2. Same as for shorted line but of opposite phase
1/8th wave length	<ol style="list-style-type: none"> 3. Circuit behaves like a pure inductance 	<ol style="list-style-type: none"> 3. Circuit behaves like a pure capacitance.
Condition "C"		
90 degrees	<ol style="list-style-type: none"> 1. Maximum impedance. 2. Maximum voltage 	<ol style="list-style-type: none"> 1. Minimum impedance. 2. Minimum voltage.

(contd)



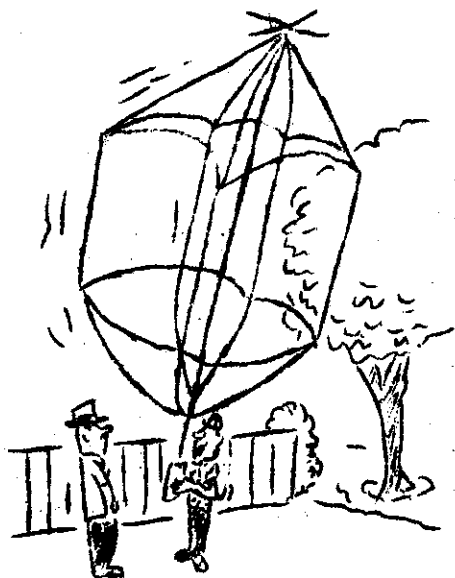
Condition "C"

1/4 wave length

3. minimum current.
4. Circuit behaves like a parallel resonant circuit of capacitance shunted by inductance.

3. maximum current
4. The circuit behaves like a series resonant circuit comprising a capacitance in series with an inductance.

It must be mentioned here that this entire treatise was initiated in order to clarify a lot of points we have heard discussed on the air from the one where a fellow in the club felt that the higher his SWR, the better his operation was, and we just couldn't convince him of anything else. There is no magic incantation or chant which can be used to improve your transmission and/or reception. There are no signal intensifiers or wave concentrators, etc. on the market at the moment...so, this artical was attempted in order to try to show the only proven way to better reports both ways on the amateur bands.



"It'll be a little easier to handle when I redesign the antenna."

FACTS THAT YOU SHOULD KNOW

ELECTRIC SHOCK

AMATEUR RADIO can be a very hazzardous sport, believe it or not! A thorough knowledge of the potential dangers of electric current to the human body is essential to the ham, would-be-ham, and the occassional fix-it-yourself handyman. People have been killed by less than 50 volts and others have survived contact with several thousand volts, WHY?

Current is a function of both voltage and resistance and it's current that does the damage. The resistance of the human body varies so widely that it becomes impossible to tag one voltage dangerous and another harmless. Body resistance is divided between internal resistance and skin resistance. Internal resis-

tance varies from about 100 ohms between the ears to about 500 ohms from a hand to a foot. Skin resistance varies from about 1000 ohms for wet skin to 500,000 ohms hand to hand for dry skin. The skin area in contact with the voltage will also affect the skin resistance.

ELECTRICITY damages the body in three ways (1) it interferes with the proper functioning of the nervous system and heart (2) it

(continued on page 13)

OF SPECIAL INTEREST AT THE

DECEMBER

GCARC MEETING....

1. A discussion on raising club dues
2. Information on the GCARC meeting room
3. Nominations
4. Elections



WILL YOU BE THERE?

TRUSTEES TO AUDIT BOOKS

The board-of-trustees has been notified that the books of the treasurer must be audited before the elections in December.

*Best wishes for a
happy holiday season*


GCARC GETS MEETING ROOM

Last month was the first GCARC meeting held since we lost the OWENS ILLINOIS CLUBHOUSE for a meeting place. As you all know, we were very fortunate in being able to use the ATLANTIC CITY ELECTRIC COMPANY'S office building in Pitman for the meeting. The December meeting will also take place in the same place.

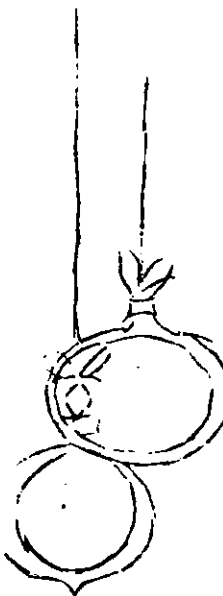
Milt Goldman K3WIL, has offered to lease GCARC a building located on his property in Sweedsboro for a dollar a year. Milt also offered to supply the paint and material that would be needed to make the building suitable for use as a club house. GCARC members would be required to do the necessary work. Several members of the board looked at the building and came up with the conclusion that a tremendous amount of work would be involved in getting the building into shape. However, a big GCARC thanks to Milt for his generous offer.

On the 10th of November members of the board assembled at the Pitman boro-hall for the purpose of taking a look at the 3rd floor which was offered to GCARC on an exclusive basis for a meeting room. All present seemed to be satisfied that this is for us! A good scrubbing, some paint and a change of locks and we will be in business. There is a large meeting room, about the size of the OWENS ILLINOIS CLUBHOUSE, and two smaller rooms. One has a stove and sink in it, and the other will serve well for a storage room.

A WORK PARTY WILL BE ORGANIZED TO PUT THIS PLACE IN SHAPE. Details will be available at the December meeting. WILL YOU GIVE A FEW HOURS OF YOUR TIME TO YOUR CLUB TO HELP WITH THIS PROJECT?



YES FELLOWS,
THERE IS A SANTA CLAUS



Twas the night before Christmas as I look back,
And there I sat with a light in the shack.

The stockings were hung by the chimney with care,
Across the band I looked for some DX to snare.

The children were nestled all snug in their bed,
While visions of rare ones danced through my head.

Up and down the band I tuned once more,
I was so tired it was becoming a chore.

When I heard it, I could hardly believe my ears,
A CQ being tapped out by eight tiny reindeers!

I turned on the rig and grabbed for the key,
And in two seconds he was answering me!

"Hello, young fellow. The handle's Saint Nick."
When I heard this, I thought I'd been hit by a brick!

"I'm on a journey to near and far,
The rig is mounted in this thing I use for a car."

"It's powered by cheer and good wishes for all.
And, by the way, thanks for giving us a call."

"Back to you," he said with a click;
But I still couldn't believe it was really Saint Nick.

The years have gone by and I've grown old.
Time after time this story I've told.

To believe it I know is really hard,
Until I show you his QSL card!

Each non-believer examines it well,
and leaves the shack really feeling swell!

For there on the wall for all to see,
Is proof of Santa's que-so with me!

And on the back of his card he wrote with red and green pens,
MERRY CHRISTMAS 'O ALL OF MY FELLOW HAM FRIENDS!



Merry Christmas
from the
"CROSSTALK"
staff

John
Bob
Gus

FROM THE POSTAL