# THE RADIO HILL GAZETTE

**Volume XXXII Issue XI** **November 2007**

*Celebrating Our 32nd Year in Publication*

## Club Calendar of Events


CLUB MEETINGS ARE HELD AT THE SCHAUMBURG RECREATION CENTER ON THE SOUTHEAST CORNER OF SPRINGINSGUTH AND BODE ROADS. OUR NETS ARE HELD EVERY THURSDAY (except Meeting nights) AT 9PM ON THE K9IIK REPEATER; 145.23 MHz.-600 kHz WITH 107.2 Hz PL

### November 2007

| | | | |
|---|---|---|---|
| Thu | 1 | 9:00 PM | SARC Net 145.230 kHz |
| Sat | 3 | 8:00 AM | Official Saturday Morning Breakfast – Maxfields |
| Sat | 3 | 9:00 AM | VE Testing Session - **CRC** |
| Thu | 8 | 9:00 PM | SARC Net 145.230 kHz |
| Sat | 10 | 8:00 AM | Construction Project – Schaumburg Tennis Plus |
| Thu | 15 | 7:00 PM | **Monthly Club Meeting – CRC & Business Meeting** |
| Sat | 24 | 8:00 AM | Construction Project – Schaumburg Tennis Plus |
| Thu | 28 | 9:00 PM | Cook Co. ARES Net – 146.880 – SARA repeater |
| Thu | 29 | 9:00 PM | SARC Net 145.230 kHz |

### November Election

The annual business meeting of the Schaumburg Amateur Radio Club Inc. will be held November 15th 2007. At this meeting we will elect the officers of the Club to serve a one year term beginning January 1st 2008. We will also elect two members to the Board of Directors to serve a three year term. The candidates for the positions are as follows.

| | | |
|---|---|---|
| **President** | John Bettasso | AJ9ON |
| **Vice-president** | Phil Sawicki | N9IQ |
| **Secretary** | Bob McIntyre | |
| **Treasurer** | Cliff Sowka | K9QD |
| **Board of Directors** | Jim Kempee | KC9LOW |
| **Board of Directors** | Bruce Widenhoffer | KB9JEJ |


### December 2007

| | | | |
|---|---|---|---|
| Sat | 1 | 8:00 AM | Official Saturday Morning Breakfast – Maxfields |
| Sat | 1 | 9:00 AM | VE Testing Session - **CRC** |
| Wed | 5 | 7:00 PM | Board of Directors meeting – Schaumburg Airport |
| Thu | 6 | 9:00 PM | SARC Net 145.230 kHz |
| Sat | 8 | 8:00 AM | Construction Project - Schaumburg Tennis Plus |
| Thu | 13 | 9:00 PM | SARC Net 145.230 kHz |
| Thu | 20 | 7:00 PM | **SARC Holiday Party** |
| Sat | 22 | 8:00 AM | Construction Project - Schaumburg Tennis Plus |
| Thu | 26 | 9:00 PM | Cook Co. ARES Net – 146.880 – SARA repeater |
| Thu | 27 | 9:00 PM | SARC Net 145.230 kHz |

### HF (High Frequency) Radio Propagation

Cliff Sowka K9QD

*A quick primer on how the earth's ionosphere plays an important role*

The American Radio Relay League (ARRL) Mentor Program offers many learning tools for Amateur Radio operators and substantial information is provided on HF Radio's relationship with the earth's upper atmosphere. The following discussion relies heavily upon the ARRL's efforts to educate the Amateur community; specifically HF radio communications. Wonderful learning resources are available at www.arrl.org.

Most people realize the atmosphere above us is comprised of gases (mainly oxygen and nitrogen) necessary for the support of life on the earth. Yes, there are additional gases as well; some inert, some nasty and some downright dangerous (a different discussion).

*Wikipedia* defines the atmosphere: as [paraphrased with lots of liberty] "a layer of gases surrounding the planet and retained by the Earth's gravity. It contains roughly (by molar content/volume) 78% nitrogen, 20.95%oxygen, 0.93% argon, 0.038% carbon dioxide, trace amounts of gases including (surely not limited to) methane, xenon, neon, ozone, ammonia, iodine, and krypton as well as a variable amount (average around 1%) of water vapor. This mixture of gases is commonly known as air. The atmosphere protects life on Earth by absorbing ultraviolet solar radiation and reducing temperature extremes between day and night.

There is no definite boundary between the atmosphere and outer space. The atmosphere slowly becomes thinner as gravity has less grip on the gaseous molecules and fades into space eventually thinning-out to the point where no molecules of gas are found becoming a pure vacuum. The Karman line, at 100 km (62 miles or 328,000 ft), is also frequently regarded as the boundary between atmosphere and outer space".

This discussion is about the curious characteristics of this medium above the surface of the Earth and how it provides fascinating results for the radio waves we launch from our antennas during transmissions. HF as utilized by Radio Amateurs lies in the lower portion of the *electromagnetic spectrum*; a natural resource available to everyone on the Earth. Unlike precious metals, diamonds, petroleum, iron ore, or other natural resources found in random locations across the globe, the *electromagnetic spectrum* is available across all geographical and political borders. Governments across the world have been amazingly successful in coordination with world allocation bodies of this spectrum such that productive international contact occurs with very minimal overlap/interference difficulty in radio operations. All Earth's inhabitants have access to this natural resource.

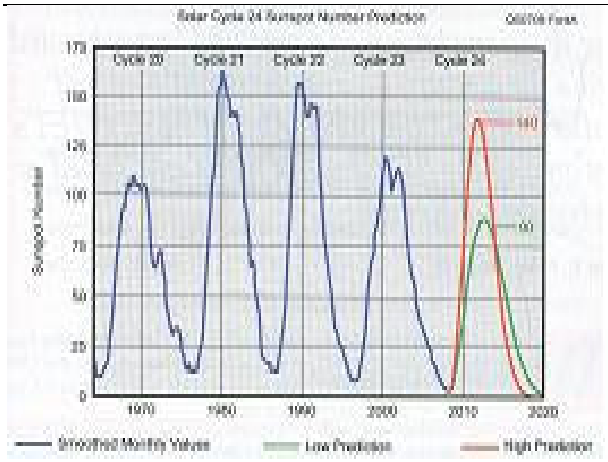
Radio Amateurs in the United States have access to this portion of Earth's electromagnetic spectrum:

| Meter Band | Frequency (MHz) | |
|---|---|---|
| | CW, RTTY, Data | Voice |
| 160 | 1.800 - 2.000 | |
| 80 | 3.500 - 3.600 | 3.600 - 4.000 |
| 40 | 7.000 – 7.125 | 7.125 - 7.300 |
| 30 | 10.100 - 10.150 | |
| 20 | 14.000 - 14.150 | 14.150 - 14.350 |
| 17 | 18.068 - 18.110 | 18.110 - 18.168 |
| 15 | 21.000 - 21.200 | 21.200 - 21.450 |
| 12 | 24.890 - 24.930 | 24.930 - 24.990 |
| 10 | 28.000 - 28.300 | 28.300 - 29.70 |

There are naturally occurring charges in a gaseous layer high in the Earth's atmosphere called the *ionosphere* . The solar activity from our nearest star, the Sun, creates the electrical mechanism that bends and reflects radio signals. Because of the ionosphere's ability to reflect HF's radio waves, we are able communicate over long distances. HF is used by many government, military, and commercial agencies worldwide.

Amateur Radio operators all over the world use HF for the same reasons of being able to communicate over long distances. When most people hear the term *ham radio* they generally think of HF or shortwave radio communications. In the United States all licensed Amateur Radio operators have privileges on the HF bands.

The Sun's rays provide the energy needed to excite the ionosphere with especially active results occurring when sunspots occur. For unknown reasons, the Sun moves through an 11-year cycle of active~inactive sunspot activity. Sunspots produce ejecta that moves rapidly outward and eventually (in hours) some of this charged material hits our atmosphere. This ejecta as well as the Sun's ultraviolet light push our atmosphere's gases into a frenzy called ionization. The ionosphere becomes more and less reflective to radio waves as it is influenced by day and night. This reflective phenomenon is analogous to a *mirror*. During the day, these reflective layers become nicely delineated into D, E, F1 and F2. As night sky settles-in, the Sun's charging diminishes therefore causing F1 and F2 to move higher in the atmosphere blending together. This has the effect of moving the radio signal *mirror* higher in the sky. Because this *mirror* is further away from the Earth's surface, radio waves can leap greater distances as they are reflected back to earth.




**Sunspot Activity reaching a 1,000 High**

Sunspots are plentiful nowadays. A new analysis shows that the Sun is more active now than it has been at anytime in the previous 1,000 years. Scientists based at the Institute for Astronomy in Zurich used ice cores from Greenland to construct a picture of our star's activity in the past. They say that over the last century the number of sunspots rose at the same time that the Earth's climate became steadily warmer. These naturally occurring 11-year cycles allow amateurs the ability to predict associated radio wave propagation over time.

**'Little Ice Age'**

Sunspots have been monitored on the Sun since 1610, shortly after the invention of the telescope. They provide the longest-running direct measurement of our star's activity. The variation in sunspot numbers has revealed the Sun's 11-year cycle of activity as well as other, longer-term changes. In particular, it has been noted that between about 1645 and 1715, few sunspots were seen on the Sun's surface. This period is called the Maunder Minimum after the English astronomer who studied it. It coincided with a spell of prolonged cold weather often referred to as the "Little Ice Age". Solar scientists strongly suspect there is a link between the two events - but the exact mechanism remains elusive.

Over the past few thousand years there is evidence of earlier Maunder-like coolings in the Earth's climate - indicated by tree-ring measurements that show slow growth due to prolonged cold.

**Latest warming**

Dr Solanki presented a paper on the reconstruction of past solar activity at Cool Stars, Stellar Systems And The Sun, a conference in Hamburg, Germany. He says that the reconstruction shows the Maunder Minimum and the other minima that are known in the past thousand years. But the most striking feature, he says, is that looking at the past 1,150 years the *Sun has never been as active* as it has been during the past 60 years.

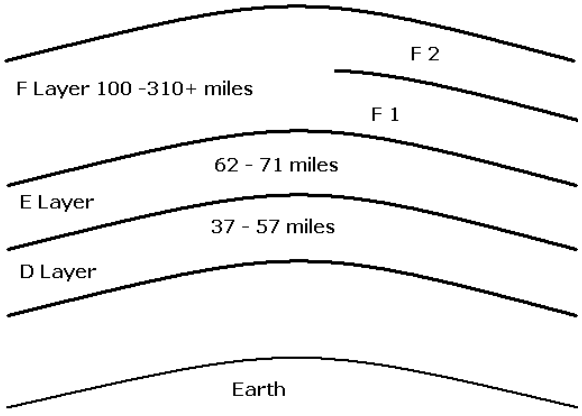
Over the past few hundred years, there has been a steady increase in the numbers of sunspots, a trend that has accelerated in the past century, just at the time when the Earth has been getting warmer. The data suggests that changing solar activity is influencing in some way the global climate causing the world to become slightly warmer.

**Beryllium**

In an attempt to determine what happened to sunspots during these other cold periods, Dr Solanki and colleagues have looked at concentrations of a form, or isotope, of beryllium in ice cores from Greenland. The isotope is created by cosmic rays; high-energy particles from the depths of the galaxy. The flux of cosmic rays reaching the Earth's surface is *modulated* by the strength of the solar wind, the charged particles that stream away from the Sun's surface. Since the strength of the solar wind varies over the sunspot cycle, the amount of beryllium in the ice at a time in the past can therefore be used to infer the state of the Sun and, roughly, the number of sunspots.

These naturally occurring 11-year sunspot cycles allow amateurs the ability to predict associated radio wave propagation over time and apparently influence other natural mechanisms in play on the Earth other than the radio signals amateurs utilize when communicating.

Radio waves change direction when they enter the ionosphere. Here are the distances above the Earth's surface of the 5 ionospheric layers of interest:

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The D Layer is the lowest and densest region of the ionosphere. It extends 37 to 57 miles above the Earth's surface. Because of its density, the D-layer tends to absorb radio signals. The absorption of RF varies by wavelength. Longer waves such as 160m and 80m are most affected. D-layer effect is less on 40m, slight on 20m and inconsequential on the higher frequencies. The ionization level of this lower part of the atmosphere is directly related to the sunlight. Therefore, The D-layer begins at sunrise, peaks at noon and disappears at sunset. The Sun's ionization of the upper atmosphere and creation of the D layer is what "closes" the low bands during the day. The disappearance of the D layer at sunset "opens" the low bands and they will remain open throughout the night.

At 62 to 71 miles above the Earth, the E layer is the lowest portion of the ionosphere useful for long distance communications. Ionization of the E layer occurs rapidly after sunrise and diminishes quickly after sunset. Minimum ionization of the E layer is after midnight, local time. Like the

D-layer, the E-layer absorbs long wavelength signals during the day. Signal absorption is highest when the sun is at its highest angle (local noon). The E layer affects other Amateur bands above 30 MHz but this discussion is limited to the HF bands.

The F layer is the uppermost region of the atmosphere. It begins at approximately 100 miles and can extend to over 310 miles above the Earth's surface. The F layer is responsible for most of our long distance communications. Because this region is so far away from the Earth's surface it is less dense than the other regions. It often takes a while for noticeable effects of the Sun's radiation to develop but the charges can last long after sunset. During the day in summertime the Sun's radiation can cause the F layer to become two separate layers called F-1 and F-2 layers.

The lower F-1 layer doesn't last long after sunset. The effects of the Sun on the ionosphere change as the seasons change because the angle between the Sun and the Earth changes throughout the yearly cycle. In the summer, during periods of high solar activity, it is not unusual to see bands like 10 and 15 meters stay open until midnight and 20 meters stay open all night.

In order to travel distances greater than "line of sight", radio signals skip off the ionosphere and return to Earth. Radio waves encountering the ionosphere above the critical angle won't be bent enough to return to Earth. Waves entering at angles below the "critical angle" reach the Earth at increasingly greater distances as the launch angle approaches horizontal. Like skipping a stone on a pond, if we send our signals off at very low angles, they will make more hops and travel farther.

HF operators will configure their antennas so that they can target their signals where they want them to be heard. HF operators also know what frequency to use at different times of the day or season for effective communications.

**There are three basic types of propagation of HF radio signals:**

Sky-wave
Ground wave
High Angle Radiation (NVIS)

The *Sky-wave* is the wave that travels to the upper regions of the atmosphere and gets reflected back to Earth by the ionized layers that we previously learned about. The *Sky-wave* is the wave that is responsible for all of our long distance communications. For long distance (DX) communications, Amateurs configure their antennas so that the radio waves take off at very low angles.

A Ground wave is the signal that radiates close to the ground from the Earth's surface up to the lower atmosphere or *troposphere* and is reflected or diffracted by the terrain. Ground waves are generally good for about 100 - 200 miles on HF during the day.

High Angle Radiation or Near Vertical Incidence Sky-wave (NVIS). NVIS would be Radio Waves that take off at very high angles are reflected straight back to Earth. Like squirting a hose at the ceiling, this technique allows you to blanket your signals over a significant area close to your station.

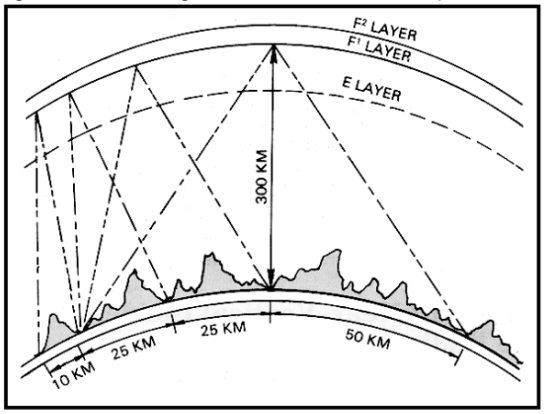
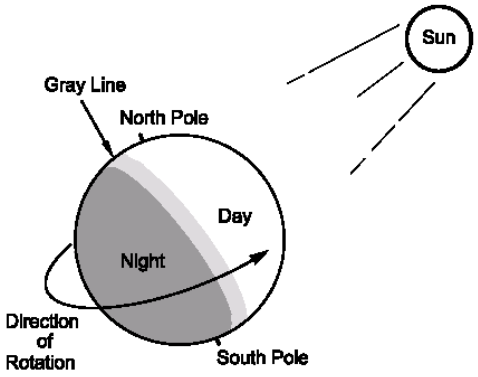



*Figure M-1. Near-vertical incidence sky-wave propagation concept.*

This technique will provide reliable communications within a 200 to 350 mile radius. Frequency choice for NVIS is typically 40m during the day and 80m at night. Unlike the ground wave, NVIS signals are not affected by terrain.

The transition between daylight and darkness is called the gray line. This area offers some unique and special propagation to the radio operator. The gray line or terminator is a transition region between daylight and darkness. One side of the Earth is coming into sunrise, and the other is just past sunset.




This discussion of High Frequency radio propagation, the influence of the ionosphere and other materials are made available by the ARRL for the promotion of our hobby. There are extensive reference materials available on the web for those who wish to learn greater detail on any of the cursory concepts presented here and it is strongly encouraged that effort is made to understand more of what the electromagnetic spectrum has to offer. Hi Hi K9QD

**Minutes of the Board of Directors Meeting**
**Schaumburg Amateur Radio Club, Inc**.
WednesdayTuesday, October 23, 2007
Board members:
Pete Schuyler, N9OF
Barb Schuyler, N9NM
Bill Smead, K9IIM
Mark Deelsnyder, KB9VHA
Kent Ochs, W9KAO
Cliff Sowka, K9QD
John Bettasso, AJ9ON

Pete called the meeting to order at 7:13PM
OLD BUSINESS
Treasurer's Report – Cliff Sowka reported that the club has $1604.96 and all bills paid. Pete asked for a motion to accept the report as presented. The motion was made by Bill and Kent seconded by. Motion carried by unanimous vote.

We received a notice from the IRS that the 2006 tax return was incomplete. Cliff will complete a new schedule A and return.

Secretary's Report – SSC status has been renewed, it's good for two years.

Presidents Report – Kent notified the board that we have a presentation for the Nov meeting.
Membership Report – no report
Public Service – no report
RHG Newsletter/Publicity – Mark Deelsnyder is looking for articles for next month.

Repeater/Construction Projects – Bill Smead reported that 10 guys came to the construction proj. meeting and built items and talked. The repeater is not working for everyone, he is looking for someone to assist the repeater committee to get them working.

VE Testing/eBay Sales – Larry Carr sent out an email indicating he sold four pieces of equipment.

Social Activities – Kim Bettasso reported that a member has recommended Buona Beef as a possible Holiday Party location. Discussion continued about the pro/cons of going somewhere for the party.
Nets – no report
Education – no report
Fox Hunts – Bruce Widenhoefer, KB9JEJ reported no more fox-hunts will be scheduled this year.
Em-Com – no report

OLD BUSINESS
The Oct. board meeting will be Pete and Barb's last meeting because they are moving out of town. Pete made a m Motion to appoint Mark the Chairman of the board, made by Kent and Cliff. Motion carried by unanimous vote.
A motion was made to appt. Cliff Sowka as a board member to sit for the remainder of Pete's term (1yr). Made by seconded Mark and by Bruce W. Motion carried by unanimous vote.
NEW BUSINESS
-
ADJOURNMENT
Meeting closed at 8:23PM.
Respectfully submitted by John Bettasso, AJ9ON Secretary

**Minutes of the Regular Meeting**
**Schaumburg Amateur Radio Club, Inc**
Tuesday, October 23, 2007

President Kent Ochs, W9KAO called the meeting to order at 7:01PM.

OLD BUSINESS
Treasurer's report – Cliff Sowka, N9QD reported the club has a $1702 balance as of the meeting and all bills are paid.

APPROVAL OF MINUTES AND TREASURER'S REPORT
Kent Ochs asked for a motion to accept treasurers and secretary's report as printed in the Oct. RHG made by Bill Smead and Pete Schyler. Motion carried by unanimous vote.

COMMITTEE REPORTS
Net Control - Rob Glowacki, N9MVO reported he is looking for 2008 net control operators.

Membership – David Detrich, KC9EHQ reported he sent Larry the new brochure and will have some printed by next meeting.

Education Chair – The club is still looking for a chairperson.

Program chair - The club is still looking for a chairperson.

Fund Raising- John forgot the ticket bucket.

VE Testing/eBay Sales – Larry Carr, NO9A reported VE sessions are always the first Saturday of the month.

Construction project – Bill Smead reported the construction project meetings have started again.

Newsletter/Public Relations – Mark Deelsnyder, KB9VHA encouraged anyone with ham articles, pictures of shack/antennas, or for sale items.

Fox Hunting – Bruce Widenhoefer, KB9JEJ reported fox hunts are over this year.

NEW BUSINESS
The nomination committee asked for officer/board nomination suggestions from the floor. Any active member who has been a member at least a year is eligible to run.

Kent reminded those in attendance that JOTA is Oct 20.

Respectfully submitted by John Bettasso, AJ9ON, Club secretary.

**VE TESTING RESULTS**

NEXT EXAMS:
**November 3, 2007**
**December 1, 2007**
Park District CRC ; Sr. Lounge.

RESULTS FOR October 6, 2007, TEST SESSION:

| CLASS | NUMBER TESTED | NEW LICENSE or UPGRADE |
|---|---|---|
| Technician | 2 | 2 |
| General | 0 | 0 |
| Extra | 0 | 0 |
| | 2 | 2 |

**NEW LICENSES:**:

**** **TECHNICIAN** ****

Jongmin Lim KC9MGW
David Pacidico KC9MGX

The SARC-sponsored VE exam sessions are held at 9:00 a.m. on the first Saturday of each month (unless it is a holiday or advised to the contrary by Schaumburg Park District) at **Schaumburg Community Rec Center (CRC)**; 505 N. Springinsguth Road; Schaumburg, IL. The CRC is located at the S.E. corner of Springsinsguth and Bode Road. Park in the North lot and enter through the North doors. Testing will be in the Senior Lounge just inside the doors. Signs will be posted to guide the way to the room.

The fee for taking a VE exam is $14.00.

According to the FCC, the test fee allows an examinee one attempt to pass or fail each of the four examination elements. In addition, the order in which the examination elements are taken is not restricted; they may be taken out of sequence.

As in the past, an identical fee will be assessed to any applicant who fails an exam and wants to retest at the same session. The only condition is that the same exam (identical set of questions) cannot be given to the applicant. Since all our exams are unique, this is not a problem at our sessions.

Larry Carr NO9A
W5YI-VEC CVE & Test Session Manager
847-593-8658
E mail: N09A@ARRL.NET

**Schaumburg Amateur Radio Club**
**Monthly Treasurer's Report**
**October 2007**

| | |
|---|---|
| **Beginning Balance** | **$1666.56** |
| | |
| **Expenses** | |
| RHG Printing; final two months from | $57.00 |
| RHG Printing – September | $63.76 |
| Annual Web Fee | $60.00 |
| Dues Refund for slight overpayment | $6.25 |
| Phone Line to Repeater | $62.00 |
| eBay Charge | $3.35 |
| **Total Expenses** | **$252.36** |
| | |
| **Deposits** | |
| Membership Dues | $58.75 |
| eBay Sales | $230.00 |
| **Total Receipts** | **$288.75** |
| | |
| **Total Cash On Hand; All Bills Paid** | **$1,702.95** |

# 2007 SARC OFFICERS

| | | |
|---|---|---|
| President: Kent Ochs | W9KAO | 847-891-6025 |
| Vice Pres.: Phil Sawicki | N9IQ | |
| Secretary: John Bettasso | AJ9ON | SkypeME |
| Treasurer: Cliff Sowka | K9QD | |
| Director: Bill Smead | K9IIM | 847 934-1817 |
| Director: Cliff Sowka | K9QD | |
| Director: | | |
| Director: Bruce Widenhoefer | KB9JEJ | |
| Director: Mark Deelsnyder | KB9VHA | 847 885-3157 |

## Membership Note...

If you've not paid your dues, this will be your last issue of the RHG. Please consider helping your club by renewing today.

## Annual Holiday Party

Planning for the 2007 holiday party is underway. Please reserve Thursday December 20, 2007 on your calendars for attending our annual event.

# SARC Membership / Renewal Form

Name:_____Call:_____Class: N T G A E Expires:_____

Street Address:_____City:_____State:____Zip:_____

Telephone (home) _____ (work)_____ ARRL Member? Yes/No if yes, expires:____

E-mail Address:_____

Date of Birth: _____ Spouse's Name: _____

Additional (non-voting) licensed persons at the same address (INCLUDE CALL, CLASS, AND EXPIRATION):

_____

_____

(If new, how did your hear about the club?) _____

_____

Special Interests: _____

_____

Type of membership:

[ ] **New membership – full voting (Licensed) $30.00 (new memberships pro-rated based on ($25 student, military, over age 65) the month the new member joins)**

[ ] Full Voting (Licensed) Membership **Renewal** ($25.00)

[ ] Additional (Licensed) Family members at SAME ADDRESS to become full voting member($15.00)

[ ] Full Voting, Senior (over 60) ($20.00)

[ ] Full voting, Full time Student ($20.00)

All memberships expire on July 1 of the upcoming year.

Signature: _____ Date: _____

Please submit your application by mail, in person at any club meeting, or to any club director or officer.

**Schaumburg Amateur Radio Club, P.O. Box 68251, Schaumburg, IL. 60168-0251**

Note! The IRS requires us to inform you that, though we are a not for profit organization, DUES are NOT tax deductible.

Schaumburg Amateur Radio Club
P.O. Box 68251
Schaumburg, IL. 60168-0251

Deliver To:

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**Thursday Night 9:00 Net**
**S.A.R.C. Repeater**
**145.23 MHz - 600 kHz**

Don't forget to check into the net! It will only take a minute and will let other club members know how you sound on the club repeater. The net features current club news, weekly NEWSLINE, news from other clubs and (of course) the swap-and-shop. Encourage your friends who are not yet members to check in with as well. Keep in mind that this is an open net and we encourage everyone to check in. See you Thursday at 9p.m.

The Schaumburg Amateur Radio Club, Inc., is organized as a general not-for-profit corporation in the State of Illinois to render public service whenever applicable to the needs of the community and further various pursuits of amateur radio as a hobby. Meetings are generally held on the third Thursday of each month. Visitors are **always** welcome.

Please send all submissions for the Radio Hill Gazette to the following address: **SCHAUMBURG AMATEUR RADIO CLUB, INC. 790 Washington Blvd. Hoffman Estates, IL 60169-3077**

Or E-mail to: **sarc-rhg@comcast.net**

We solicit letters, articles, news items, quizzes, advertisements, suggestions, and criticism -- plus anything else you can think of, including ideas to improve the RHG!

The editor reserves the right to edit submissions due to size or formatting limitations. S.A.R.C. shares newsletters with a number of other clubs. We scrutinize their publications very closely to make sure that we do not infringe on any copyrights. As a matter of form, we try to acknowledge all prior sources.



SARC is a recognized ARRL Special Services Organization.

*The Schaumburg Amateur Radio Club publishes the Radio Hill Gazette monthly*. Opinions expressed herein are those of the contributors and not necessarily those of the Schaumburg Amateur Radio Club. 

SARC Home Page URL

http://n9rjv.org