



# HOSARC Repeater Gets Echo-IRLP

Echo-IRLP has finally arrived to the HOSARC repeater thanks to the efforts of Rob Smith, AB2UV. Club members can now connect to the club repeater from anywhere in the world, as long as there is an internet connection and computer available.

It's not just IRLP; it is Echo-IRLP because the repeater also has a connection to Echolink.

IRLP stands for Internet Radio Linking Project. The aim of the project is to reliably and inexpensively link amateur radio systems

without the use of RF links, leased lines, or satellites. IRLP uses Voice-Over-Internet-Protocol custom software and hardware. Coupled with the internet, IRLP can connect repeaters and simplex stations around the world, often with telephone quality sound.

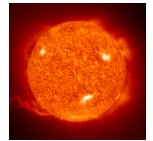
Echolink is similar to IRLP in that stations can connect to each other via the internet. However, IRLP requires the use of a radio, while Echolink does not. With Echolink an operator can make contacts by using a microphone connected

directly to a personal computer. Echolink and IRLP are two different communication networks. Echo-IRLP provides a bridge between the two.

If you hear a DX station coming through the repeater, it is not your imagination. It is actually a distant station trying to make contact with you via a radio connected to the internet.

Check out the club website for more information on this exciting new development.

## Understanding Solar Indices by Ken Larson, KJ6RZ



Long distance HF radio communications is made possible by a region of charged particles in the Earth's upper atmosphere, 30 to 200 miles above the Earth's surface. This region is called the ionosphere.

The ionosphere is formed when extreme ultraviolet (EUV) light from the sun strips electrons from the neutral atoms in the Earth's

upper atmosphere. The more familiar ultraviolet light has a shorter wavelength than visible light and is more energetic. Extreme ultraviolet light is even more energetic. When a bundle of EUV light (called a photon) hits a neutral atom, such as an oxygen atom, its energy is transferred to an electron in the neutral atom. This additional energy allows the electron to escape from the

atom and dart freely around on its own. The neutral atom thereby becomes positively charged, because it has lost a negatively charged electron, and is known as a positive ion. The process in which the photon strips an electron from a neutral atom is known as photoionization. Recombination is the reverse of photoionization. Recombination occurs when a negatively charged

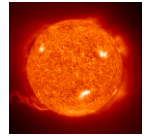
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### THE AMATEUR'S CODE

#### The Radio Amateur is:

- |                    |                  |
|--------------------|------------------|
| <i>Considerate</i> | <i>Loyal</i>     |
| <i>Progressive</i> | <i>Friendly</i>  |
| <i>Balanced</i>    | <i>Patriotic</i> |



electron and positively charged ion combine together again to produce a neutral atom. Recombination occurs continuously 24 hours a day. However, photoionization, caused by the EUV light from the sun, occurs only during day light hours. Thus the level of ionization in the ionosphere increases during the day when EUV light is present and decreases at night due to the lack of EUV energy and the continuous recombination process.

The ions in the ionosphere are too massive to respond to the rapid oscillations of a radio wave and thus have little affect on radio wave propagation. However, the free electrons are over 20,000 times lighter than the ions and do respond to radio wave oscillations.

Three major bands of ionization (called the D, E, and F layers) occur in ionosphere. The F layer (the highest layer) is the one primarily responsible for long distance HF communications.

The free electrons in the F layer, 140 to 200 miles above the Earth, interact with radio waves causing them to bent back toward the Earth's surface. The electrons react easier with low frequency radio waves than with higher frequency signals. As a result, a relative thin F layer will bend low frequency radio waves back to Earth. Long distance communications on the amateur radio low frequency 160 meter (1.8 MHz), 80 meter (3.5 MHz) and 40 meter (7 MHz) bands is possible at night when ionization in the F layer is low. The free electrons do not react as easily with the rapid oscillations of higher frequency radio waves. Thus a higher density of free electrons are required to bend radio waves in the 30 meter (10 MHz) and 20

meter (14 MHz) amateur bands back to Earth. Long distance communications on these bands are typically possible during the day and early evening hours when ionization levels in the F layer are high to moderate. Even higher densities of electrons are needed to bend radio waves in the 17 meter (18 MHz), 15 meter (21 MHz), 12 meter (24.9 MHz), and 10 meter (28 MHz) bands back to Earth. Long distance communications is generally

tions on these bands are confined to line of sight and repeater operation.

Recombination occurs more quickly in the E layer than in the F layer because the atmosphere at the altitude of the E layer (60 to 70 miles above the Earth) is more dense. Thus the E layer typically exists only during the day light hours. The E layer bends low frequency signals, in the 160 through 40 meter amateur bands, back to Earth during the day, providing short range day time communications on these bands. The electron density in the E layer is not sufficient to bend radio waves above 20 meters (14 MHz) back to Earth.

Recombination occurs very quickly in the D layer which is about 30 to 55 miles above the Earth's surface. The D layer only exists during the day and is not sufficiently dense to bend HF radio waves back to Earth. The primary affect of the D layer is to absorb energy from low frequency radio waves, particularly radio waves in the 160 through 40 meter amateur bands. The 160 and 80 meter bands will typically be dead during the day because of D layer absorption.

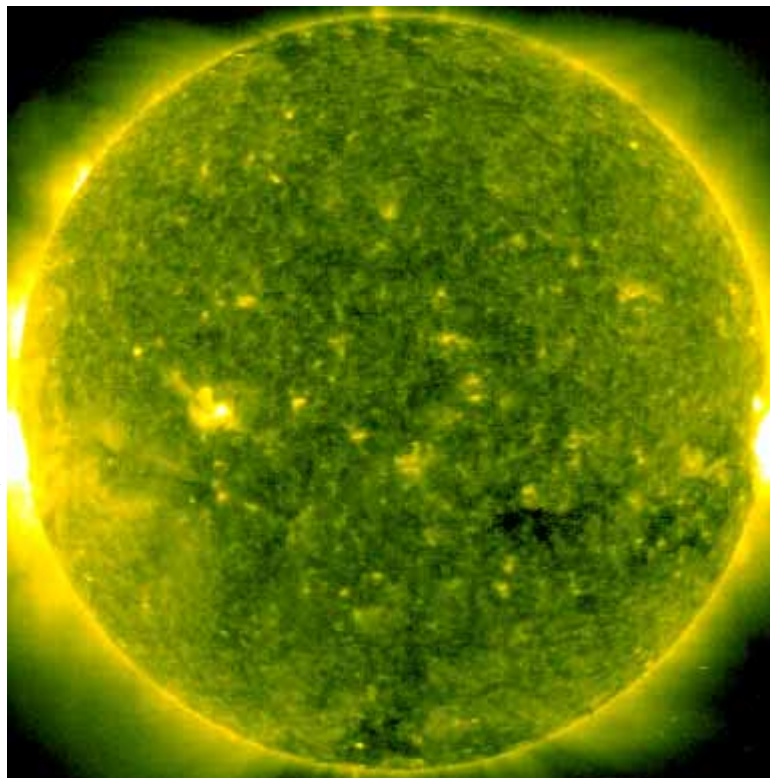
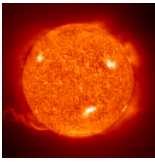


Photo of solar disk taken on November 24, 2006 at UTC 19:06

possible on these bands only during the day light hours when ionization in the F layer is greatest. Very high levels of ionization are required to bend signals in the 6 meter (50 MHz) band back to Earth. Ionization in the F layer is never high enough to bend 2 meter (144 MHz), 1.25 meter (222 MHz), 70 cm (420 MHz), and higher frequency waves back to Earth. These radio waves travel through the ionosphere and into outer space. Frequencies in the 2 meter and above amateur bands are thus required for Earth satellite communications since they pass through the ionosphere. Terrestrial communica-

Small variations occur daily in the ultraviolet energy received from the sun. On days when relatively high energy levels are received, ionization in the F layer will increase and long distance HF communications will improve. Also, the highest usable HF frequency will increase. For example, the 15 meter band (21 MHz) may be usable for communications with Australia. On low energy level days, the F layer is not as heavily ionized, the highest usable HF frequency decreases, and long distance HF communications deteriorates. During a low energy level day the 15 meter band may be dead with 20 meters (14 MHz) being the highest usable frequency band.



# Solar Indices by Ken Larson, KJ6RZ, continued from page 2

In addition to daily variations, the amount of ultraviolet energy received varies over an 11 year cycle in accordance with sunspot activity on the sun's surface. During a sunspot minimum there will be few if any sunspots visible on the sun's surface, ultraviolet energy from the sun will be at its lowest level, and the 20 through 10 meter amateur bands may be unusable for months at a time due to low F layer ionization. Over the following several years sunspots will gradually appear and increase in number reaching a maximum approximately 5½ years after the sunspot minimum. At the sunspot maximum over 200 sunspots are typically visible. Ultraviolet energy from the sun will be at its

(7 MHz) typically being the highest usable frequency band.

An increase in solar flux values for a period of several days generally indicates an improvement in long distance HF communications during that time period. For example, the highest usable frequency will generally increase and HF communications improve if the solar flux has been running about 110 and then jumps to around 130 for several days. In contrast, the highest usable frequency will decrease and HF communications deteriorate if the solar flux instead falls to 90.

The sun is continuously ejecting large

Small numbers of particles arriving from the sun have relatively little affect on the Earth's geomagnetic field. Under these conditions the geomagnetic field is considered to be quite. Large numbers of charged particles can cause considerable disturbances in the geomagnetic field. A disturbed geomagnetic field is called a geomagnetic storm.

For any given solar flux value, HF communications will improve when the geomagnetic field is quiet, and worsen during a geomagnetic storm. A geomagnetic storm cause the F layer to become unstable, fragment, and even seem to disappear. Storm conditions are more severe in

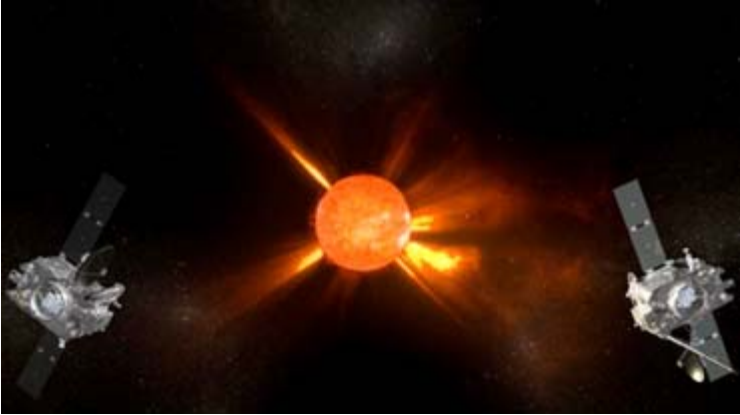
Solar Flux	Expected Band Conditions
50 - 70	Bands above 40 meters unusable
70 - 90	Poor to fair propagation on 20 meters and below
90 - 120	Fair conditions up through 15 meters
120 - 150	Fair to good conditions on all bands up through 10 meters
150 - 200	Excellent conditions through 10 meters with openings on 6 meters
> 200	Reliable communications on all bands through 6 meters

highest level during a sunspot maximum and reliable HF communications on the 160 through 10 meter amateur radio bands will be possible on a regular basis. The sunspots will then begin decreasing, causing a deterioration in long distance HF communications, until the next sunspot minimum is reached.

The amount of energy received from the sun is measured daily in terms of the solar flux. The solar flux can vary from as low as 50 to as high as 300. During a sunspot maximum, solar flux values will typically exceed 200 resulting in excellent long distance HF communications on the 20 through 10 meter amateur bands. Solar flux values will range from 50 to 80 during sunspot minimums yielding poor long distance communications with 40 meters

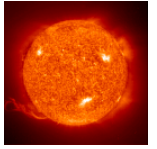
quantities of charged particles (atoms stripped of their electrons) into space. Some of these particles eventually arrive at the Earth and interact with the Earth's geomagnetic field. The amount of charged particles ejected by the sun var-

the regions around the Earth's magnet poles since the charged particles from the sun are drawn to the poles by the Earth's magnetic field. As a result, signal paths that traverse the polar regions will be more affected by a geomagnetic storm than signal paths that cross the equator.



ies from day to day and also with the 11 year sunspot cycle. The amount of particles arriving from the sun increases as the cycle approaches the sunspot maximum.

The occurrences of solar flares also increases with increasing sunspot activity. A solar flare creates a burst of additional EUV energy and also ejects large quantities of charged particles into space. The EUV energy reaches the Earth in about 8 minutes creating what is know as a Sudden Ionospheric Disturbance (SID). The burst of EUV increases the ionization levels in the D, E, and F layers. The increased F layer ionization may help the propagation of high frequency signals (15 meters and above). However, the increased ionization in the



# Solar Indices by Ken Larson, KJ6RZ, continued from page 3

D and E levels may result in the complete absorption of radio signals in the 160 through 40 meter bands and seriously degrade propagation at 30 and 20 meters. A SID may last from a few minutes to several hours, with conditions gradually returning to normal. The charged particles from the flare will arrive at the Earth in 20 to 40 hours. The particles will generally create a geomagnetic storm on their arrival.

Improved HF band conditions are thus indicated by higher than normal solar flux values and low A and K values.

Mid latitude solar indices (solar flux, A, and K values) are broadcast at 20 minutes after the hour by radio station WWV on 5, 10, 15, and 20 MHz. They are also available on the Internet at [www.qrz.com](http://www.qrz.com) and in the K7VVV Solar Updates that are posted regularly on the ARRLWeb at [www.arrl.org](http://www.arrl.org). The K7VVV updates are very good and provide links to other web sites for more information on solar indices and HF propagation. A good discussion of solar

indices is also provided in the September 2002 QST magazine.

*Article and all tables reprinted by permission of Ken Larson, KJ6RZ.*



*Radio telescopes monitoring the sun.*

A	K	Geomagnetic Field	A	K	Geomagnetic Field
0 - 3	0	Quiet	48 - 79	5	Minor storm
4 - 6	1	Quiet to unsettled	80 - 131	6	Major storm
7 - 14	2	Unsettled	132 - 207	7	Severe storm
15 - 47	3 - 4	Active	208 - 400	8 - 9	Very major storm

*The condition of the geomagnetic field is measured in terms of A and K values in accordance with the above table.*

Year	1997	1998	1999	2000	2001	2002
Solar Flux	81	117.9	153.7	179.6	181.6	179.5

*This is an interesting chart since it indicates that the current sunspot maximum, as measured by solar flux values, was reached in 2001. Moreover, solar activity has remained near this peak for the last 3 years!*



## Club News and Other Ham Radio Happenings

The DSL line has been installed in the club shack. We now have IRLP and fast internet connection.

At the November general membership it was announced that there are two vacancies on the Board of Directors. One of the vacancies is the position of Recording Secretary. The club is in the process of holding elections for various officer and board positions. If you are interested in running for office please contact James Rubin.

Club dues are here again. If you haven't paid your dues please do so at the next meeting. You can pay your dues to our Treasurer Steve, WB2KDG.

The club is selling a Kenwood TS-440 with matching power supply and optional filters. Also for sale is a Kenwood TS-850 and a 1.2 GHz repeater. If you are interested in purchasing any of these radios please contact Tom, KC2CBA, immediately.

Club President Allen, AE2J, announced that he is interested in conducting NVIS experiments. This is a form of emergency communication that employs the low bands to provide local communications without relying on repeaters or other point-to-point methods. If you are interested in participating in these experiments please contact him.

Rob, AB@UV, reports that the satellite antenna is operational again.

The November meeting was lots of fun. Board Chairman Tom, KC2CBA, did a photo expose of all the events that transpired during 2006. During the slide show different members of the club stood up and discussed the various events. At the conclusion of the slide show, Tom said that the club has to begin planning 2007 events now, if we are going to have another year of fun-filled activity.



## New Member Focus: Pete Taylor, W2PJT

Pete Taylor has had his FCC Technician Class license for a little over a year now, and he has dove head first into the hobby. Born in 1972, Pete was first introduced to the hobby of ham radio by his college buddies at the University of New Castle in the United Kingdom.

Pete was an avid shortwave listener and scanner. One day he met a ham radio operator who was also the Chief Radio Officer for the British Antarctic Survey Team. Pete found this person to be so intriguing that an interest in ham radio soon developed.

Even though Pete can't make claim to ever having an Elmer to show him the ways of ham radio, his background in electrical engineering gave him the technical wherewithal to learn the hobby fast.

Pete has a lot of other hobbies besides ham radio. He enjoys sailing,

scuba diving, and photography just to name a few. Like all of us, he wishes he had more time and money to pursue them all. One of the things he likes most about ham radio is the broadness of the hobby,

which is something you don't normally find in other interests.

At present, his only ham radio equipment is a Yeasu VX-7. He will be acquiring additional equipment in the near future as he is interested in exploring VHF and HF digital communications.

Pete currently works for a major financial institution as an IT security professional. His goal in 2007 is to build a respectable station at home and finish a very long list of home improvements.

Welcome to the club, Pete. We hope you like it here.



*Pete Taylor, W2PJT*

# HOSARC Provides Communications at NYC Marathon

The 2006 NYC Marathon was again staffed by HOSARC volunteers providing communications support to race organizers. The marathon is usually thought of as a running event, but for amateur radio operators it is a great opportunity to experience an important radio event, where amateur radio plays a critical support role in a world-wide recognized sporting event. The race draws more than 90,000 applicants and attracts world-class professional athletes. With 315 million television spectators and \$600,000 in prize money, the 26 mile race is a much anticipated yearly event.

HOSARC was present providing support at mile 13, which is at the end of the Pulaski Bridge in Long Island City, Queens. Mile captain Mike, N2WGC, had the following to say after the event: "As usual the crew with some new faces and some old, did a tremendous job covering the half marathon point at mile 13.1! This was probably the best ground coverage we have ever had from mile 13 all the way through to mile 14. Excellent coordination and race day cooperation with mile captains at 13 and 14 worked excellently. With new and old we were able to welcome our out of town guests with some more seasoned vets, and some seasoned vets with some new ideas. Great job done was by all. I look forward to seeing you all again in 2007! Thanks for your dedication to Mile 13.1! The best crew that a Mile Captain could ask for!"



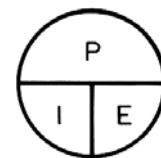
*The belly of Howie, WB2HLW, is made famous by this photo which appeared in the Queens Tribune in an article about the NYC Marathon. Howie, next time hang a sign off your stomach displaying the HOSARC name.*



Jeff, N2HPO, operates SATERN communication boxes.



Marathon mile captains-r-us. Mike, N2WGC, is on the left.



# HOSARC Offers Free FCC Technician Class Training

HOSARC has started a free ham radio class at the New York Hall of Science. The goal of the ham radio course is to improve training in communication, science, and ionospheric transmissions.

HOSARC has started a series of training classes preparing anyone interested in taking the FCC technician class amateur radio license. The classes are four weeks in duration and are held on Saturday mornings. They begin at 9 am and end at 11 am at the New York Hall of Science. The first class was scheduled for July 1, 2006.

Students learn about the United States Federal Communications Com-

mission's (FCC) rules and regulations regarding amateur radio, elementary physics, modes of radio transmission, and emergency communications. Along with teaching the science of radio and short

and long distance communication, there is ample time allotted in each classroom session for questions and answers with the instructors. Students will have the unique opportunity of hands-on learning by visiting and using a real working amateur radio station.

If anyone is interested in signing up for one of the courses, or wants more information on becoming an amateur radio operator, please contact Rob Smith, AB2UV, at [rob@ab2uv.com](mailto:rob@ab2uv.com)

## HOSARC 2006 TRAINING SCHEDULE TECHNICIAN CLASS LICENSE PREPARATION

Session	Dates	Time	Lesson Plan	Class Activity	Session	Dates	Time	Lesson Plan	Class Activity
Batch 1	27-May-06	9am-11am	Introduction to Amateur Radio	Tour Radio Shack	Batch 5	7-Oct-06	9am-11am	Introduction to Amateur Radio	Tour Radio Shack
	3-Jun-06	9am-11am	Chapters 2-3 and Q&A	HF Demo		14-Oct-06	9am-11am	Chapters 2-3 and Q&A	HF Demo
	10-Jun-06	9am-11am	Chapters 4-5 and Q&A	SSTV/Satellites		21-Oct-06	9am-11am	Chapters 4-5 and Q&A	SSTV/Satellites
	17-Jun-06	9am-11am	Chapters 6-7 and Q&A	Morse Code		28-Oct-06	9am-11am	Chapters 6-7 and Q&A	Morse Code
	1-Jul-06		Final Exam			4-Nov-06		Final Exam	
Batch 2	1-Jul-06	9am-11am	Introduction to Amateur Radio	Tour Radio Shack	Batch 6	4-Nov-06	9am-11am	Introduction to Amateur Radio	Tour Radio Shack
	8-Jul-06	9am-11am	Chapters 2-3 and Q&A	HF Demo		11-Nov-06	9am-11am	Chapters 2-3 and Q&A	HF Demo
	15-Jul-06	9am-11am	Chapters 4-5 and Q&A	SSTV/Satellites		18-Nov-06	9am-11am	Chapters 4-5 and Q&A	SSTV/Satellites
	22-Jul-06	9am-11am	Chapters 6-7 and Q&A	Morse Code		25-Nov-06	9am-11am	Chapters 6-7 and Q&A	Morse Code
	29-Jul-06		Final Exam			2-Dec-06		Final Exam	
Batch 3	5-Aug-06	9am-11am	Introduction to Amateur Radio	Tour Radio Shack	Batch 7	2-Dec-06	9am-11am	Introduction to Amateur Radio	Tour Radio Shack
	12-Aug-06	9am-11am	Chapters 2-3 and Q&A	HF Demo		9-Dec-06	9am-11am	Chapters 2-3 and Q&A	HF Demo
	19-Aug-06	9am-11am	Chapters 4-5 and Q&A	SSTV/Satellites		16-Dec-06	9am-11am	Chapters 4-5 and Q&A	SSTV/Satellites
	26-Aug-06	9am-11am	Chapters 6-7 and Q&A	Morse Code		23-Dec-06	9am-11am	Chapters 6-7 and Q&A	Morse Code
	2-Sep-06		Final Exam			30-Dec-06		Final Exam	
Batch 4	2-Sep-06	9am-11am	Introduction to Amateur Radio	Tour Radio Shack					
	9-Sep-06	9am-11am	Chapters 2-3 and Q&A	HF Demo					
	16-Sep-06	9am-11am	Chapters 4-5 and Q&A	SSTV/Satellites					
	23-Sep-06	9am-11am	Chapters 6-7 and Q&A	Morse Code					
	30-Sep-06		Final Exam						



## Marketplace

If you would like to list a piece of equipment please send an email to the Editor. Good luck and happy hunting.

**Seller: KC2KXC**

**Email: motoshack@optonline.net**

Mark has a number of commercial Motorola radios for sale. All of these radios are capable of covering the ham bands and then some. Mark has a Motorola Astro Saber in excellent condition. The Astro Saber covers 403 MHz to 470 MHz. Mark also has a very rare Motorola GP300 radio that covers the 220 MHz band! Send Mark, KC2KXC, an email if you are interested in his radios.

**Seller: KC2CBA**

**Email: Tomflushing3@aol.com**

Tom has 50 feet of RG-8 coax, brand new in the box from Radio Shack. He is looking to sell it for \$22. If you are interested please send Tom an email.

**Seller: K0SID**

**Email: sidney@sidneyko.com**

Sidney has Yaesu FT50 dual band handheld radio in excellent condition for sale.

This is a solid radio. It comes with dual battery charger (NC-50), two NiMH batteries, and a built-in digital recorder. Asking price is \$250.

Also for sale is a Yaesu FT-847 HF/VHF/UHF transceiver with cross-



band repeat in excellent condition, very clean. It comes with original power cable, hand microphone, and optional voice synthesizer installed. Asking price is \$1,200.

For sale is a Yaesu VX-150 VHF handheld radio in very good condition. Radio is a solid performer. It comes with original battery and wall charger. Asking price is \$100.

Sidney also has a Radio Shack HTX-10, 10 meter FM and SSB mobile transceiver for sale. It is brand new and still in the box. Asking price is \$75.

Motorola Saber I, UHF handheld radio with 12 channels. Radio does not come with battery or antenna. It is a very clean commercial radio in good condition. Asking price is \$75.

Finally, Sidney is selling his Sony Vaio Notebook VGN-T250. It is in good condition. Laptop is ultra portable with a long lasting battery and was recently upgraded with 1 GB RAM. Deal includes power supply and 5.0 MP Sony W1 digital camera. Asking price is \$1,600.

**Seller: HOSARC**

**Email: tomflushing3@aol.com**

The club is selling a Kenwood TS-440 including matching power supply and all optional filters. The club is asking \$500. The radio has never been used.

The club is also selling an Icom 1.2 Ghz repeater, including repeater, controller, duplexer, and amplifier. The club is asking \$2,500 for the entire package.

*Welcome to the following new member:*

**Marc Tenenbaum, KC2PTG**



# December 2006

Sun	Mon	Tue	Wed	Thu	Fri	Sat
					1	2
3	4	5 Board Meeting	6 Club Net	7	8	9
10	11	12 General Meeting	13 Club Net	14	15	16
17	18	19	20 Club Net	21	22	23
24	25	26	27 Club Net	28	29	30
31						

## Schedule of Events

- December — Holiday Party; Club Vote
- January — ARRL VHF Sweepstakes
- February — ARRL International DX
- March — Timonium Hamfest
- April — Kit Building Night
- May — Dayton Hamfest
- June — Field Day; HOSARC Hamfest
- July — Fishing Trip; BBQ Party
- August — No Meeting
- September — VHF QSO Party
- November — ARRL Sweepstakes



## Chairman's Report by Tom Golero, KC2CBA

Hello!

First of all, I'd like to wish everyone a happy holiday. Our November meeting was well attended, and the program was "2006 A Year in Review". It was a slideshow of photos taken at various HOSARC events during the past year. 2006 was chock-full of activities, ranging from being guest operators at a major contest station, landing 35lb plus striped bass off of Montauk, demonstrating radio at public school science fair, and getting soaked at Field Day.

It is our goal for 2007 to continue these great activities and hopefully to get some of our newer club members more involved in club activities.

Some of the ideas I have that I would like to briefly pitch are the following: a trip to Camden, NJ to operate NJ2BB aboard the USS New Jersey; more portable operations; lighthouse activation; conduct a

special event station at the club shack; high altitude operations; and another fishing trip. The possibility for club activities is limited only by your imagination, input, and enthusiasm.



*The official HOSARC QSL card*

The Board is in the process of amending the club constitution. The changes will make it easier to run for officer and board

positions. We hope that these changes will draw greater participation in the annual elections.

More than 51 people have signed up for this year's holiday party, which is absolutely fabulous. I personally am really looking forward to the party.

I hope that the trend of increased participation will continue through 2007. The attendance at the meetings has been good; let's see if we can make it even better. I am looking forward to another great year for HOSARC!

73, Tom



**NEW YORK HALL OF SCIENCE  
AMATEUR RADIO CLUB**

36 Technicians  
13 Generals  
3 Advanced  
27 Extras

**NewsFuse Editor:  
Felix Lam, K2KHV**

***Do you have a story?  
Contact the NewsFuse Editor.***

***Check us out at  
WWW.HOSARC.ORG***

*The Hall of Science Amateur Radio Club, HOSARC, was founded in 1972 and is affiliated with the New York Hall of Science, a hands-on science and technology center located in the historic Flushing Meadows, Corona Park in Queens, New York. HOSARC club members maintain and operate the amateur radio exhibit located in the lower level of the center's central pavilion. The exhibit is a fully functional radio shack, equipped with top-of-the-line, modern amateur radio equipment. The shack operates all modes on all HF, VHF, and UHF bands. Visitors to the Hall of Science can operate the kilowatt HF station, WB2JSM. The club also operates the WB2ZZO repeater on 444.200 with a positive shift and a PL tone of 136.5. You do not have to be a club member to use the repeater; all are welcome. Please join our club nets which occur every Wednesday evening at 9pm. Net control operators are Ken, K2JLK and Bernie, K2ZIR. The club meets at 8pm every second Tuesday of each month in the cafeteria of the New York Hall of Science. Come on down, and meet the gang!*



## Amateur Radio Operator's Code of Conduct

The Code has appeared in every issue of the Radio Amateur's Handbook since 1927.

The radio amateur is:

**CONSIDERATE**, never knowingly operates in such a way to lessen the pleasure of others.

**LOYAL**, offers loyalty, encouragement, and support to other amateurs, local clubs, and the American Radio Relay

League, through which Amateur Radio in the United States is represented nationally and internationally.

**PROGRESSIVE**, with knowledge abreast of science, a well-built and efficient station, and operates above reproach.

**FRIENDLY**, slow and patient operating when requested; friendly advice and counsel to the beginner; kindly assis-

tance, cooperation, and consideration for the interests of others. These are the hallmarks of the amateur spirit.

**BALANCED**, radio is an avocation, never interfering with duties owed to family, job, school, or community.

**PATRIOTIC**, station and skill always ready for service to country and community.



**The HOSARC Board of Directors:**

Tom Golero, KC2CBA, Chairman  
Dave Ellenberg, WA2KWP  
Sidney Ko, K0SID

Alvin Levine, KB2SDX  
Lenny Menna, W2LJM  
Tom Tumino, N2YTF

Ilda Schneider, KC2JOM  
James Schneider Sr., WA2UTR  
Felix Lam, K2KHV

**The HOSARC Officers:**

Allan Koenigsberg, AE2J,  
*President*  
Bernard Stein, K2ZIR,  
*Vice President*

Howard Weissman, WB2HLW,  
*Secretary*

Steve Greenbaum, WB2KDG  
*Treasurer*