



# THE LED

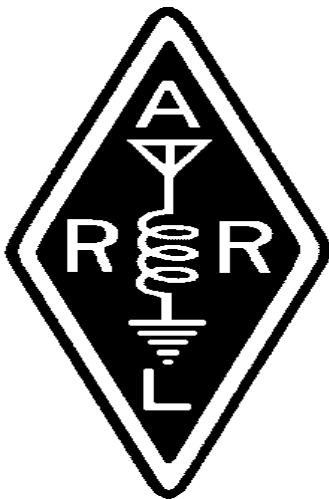
Published by the  
Livingston Amateur Radio Klub  
Howell, Michigan

# OCTOBER 2003

<http://www.qsl.net/milark>

Livingston Amateur Radio Klub  
PO Box 283  
Howell, Michigan 48844

Dated Material



NEXT KLUB MEETING  
OCTOBER 9<sup>th</sup> 7:30 P.M.  
EMERGENCY OPERATIONS CENTER  
300 SOUTH HIGHLANDER WAY

NET 146.680 SUNDAY 9 P.M.

CLUB CALL IS: KB8ZTV

## BOARD MEMBERS

President	Art	KC8WAZ
Vice-President	Melissa	KC8UTF
Secretary	Mary	KC8SER
Treasury	Clairus	KC8QQN
Program Director	Bob	K8VQC
Tech Coordinator	Chuck	W8CLK
Board Member	Paul	KC8UKF

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## COMMITTEE CHAIRPERSON'S

146.680 Repeater	Jack	KA8BOG
LED Editor	Jim	WB8AZP
VE Coordinator	Greg	AA5GO

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## .PREZ SAYS

Summer has managed to come and go in what seems to be a blink of the eye. We had a great deal of fun with the LARK picnics, and our summer meetings. Here's hoping that the fall weather will bring more members out to our meetings.

The program director is doing an excellent job of lining up interesting topics, including this month's topic: Fox Hunting. Let's "pack the house" for the October meeting!

73

Art KC8WAZ

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## . EDITORS COMMENTS



Editor's XYL Bobbi, Chef Clemmins & Jim WB8AZP

September was a busy month for me. Despite the threat of bad weather brought on by hurricane Isabel, our outdoor wedding on Catawba Island in Ohio came off without a hitch...well, actually, I did get hitched! Bobbi and I managed to squeeze in a little relaxation time afterward, and we're now both back at work.

I haven't convinced Bobbi of the need for a ham license, but I doubt if that will keep me from buying radio gear. Her hobby is fiber art (quilting, specifically) and costs just about as much as a new rig or two!

Apparently, my pleading for articles has reached many of you, and you'll find that the October edition of the LED is filled with all kinds of interesting material to read and enjoy. My thanks to all who have answered the call, and my continued pledge to support all of you who want to jot down those articles for future editions of the Klub newsletter.

Please note that my policy is to attach your name to original articles or regular columns. I do appreciate submissions from other sources, and will do my best to honor any specific conditions described in the material. As I mentioned at the last Klub meeting, we're not dealing with Time or Newsweek here, it's just a friendly little radio group newsletter.

I've had a very unique opportunity to spend time with Joe Caruso, a motivational speaker and author right here in Michigan. Joe's latest book; The Power Of Losing Control, is a great read for anyone who truly wants to improve themselves and unlock the strengths that are hidden in all of us.

One of Joe's "taglines" related to dealing with life in general is "Accept, Adjust, and Achieve". I think it's particularly applicable to all of us in the Klub, as well.

There is real power in ACCEPTING everyone just the way that they are. This doesn't mean that you have to agree with them, or even like their style for doing things. Everyone gets to be who they choose to be.

We all constantly ADJUST to the changing conditions around us. Last month, Art asked the KLUB officers to join him at the front of the meeting room. That's a real good example of adjusting to the change around us. Whatever the goal is, we often need to be prepared to adjust our course, to try new ways and embrace new ideas.

Accepting & Adjusting to our environments lead us directly into ACHIEVING more, almost automatically. With our hearts and minds open to new possibilities, we can easily accomplish just about anything.

Remembering to Accept, Adjust, & Achieve can help make a positive difference in everything that we do, including the Livingston Amateur Radio Klub. Most importantly, it can make a big difference in each of us.

See you at the next meeting!

Jim WB8AZP

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**TREASURER REPORT  
GENERAL OPERATING FUND**

FOR PERIOD SEPTEMBER 1, 2003 TO  
SEPTEMBER 30, 2003

**OPENING CASH (CHECKING ONLY)**  
\$ 287.68

**INCOME**

SEPTEMBER 50/50  
33.00

DONATION OF 50/50 WINNINGS  
33.00

MEMBERSHIP DUES  
20.00

TOTAL DEPOSIT  
86.00

**EXPENDITURES**

JIM WB8AZP, PRINTING SEPT LED  
\$26.75

PHONE BILL FOR OCTOBER, NOVEMBER,  
DECEMBER  
\$75.00

REPEATER FREQUENCY COORDINATION DUES  
30.00

ENDING BALANCE SEPTEMBER  
\$ 241.93

OPENING CASH ( CD \$1,000.)  
\$1,221.59

OPENING CASH ( CD \$500.)  
588.29

TOTAL OPERATING CASH.  
\$2,051.81

**EMERGENCY COMMUNICATIONS  
FUND TREASURER REPORT.**

PERIOD FROM SEPTEMBER 1, 2003 TO SEPTEMBER  
30, 2003

**OPENING CASH (CHECKING ONLY)**  
\$994.75

**INCOME**

LABOR DAY OPERATION CARE DONATIONS  
550.48

BALANCE SEPT. 31.  
\$ 1545.23

Respectfully submitted,

Clairus KC8QQN

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**HELP**

I am looking for a QSL route for the following countries:  
A3 - Tonga and TN - Congo.

The ARRL outgoing QSL Service does not serve either of these countries and I cannot find any bureaus listed.

Can anyone help me? Give me a call at 517-521-4488 or drop me an email at ke8z@earthlink.net

Thanks,

Dave KE8Z

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## **SECRETARY'S REPORT**

### **GENERAL MEETING**

09/12/03

Art, N8WAZ, called the meeting to order at 7:30. The Pledge of Allegiance was recited.

#### PRESENTATION

Tim, WB8HRO, gave a presentation on packet radio, Part II. Thanks Tim on the demonstration of the KAWIN program and how to pass traffic using it. There was a question and answer period after the presentation.

#### REPORTS

Secretaries Report: Mac, N8RBA made motion to accept the Secretaries Report. Bruce seconded the motion. Motion passed.

Treasurers Report: Clairus, KC8QQN, gave the Treasurer Report. A few questions were asked which she answered. Dave, KE8Z, made motion to accept the Treasures Report. Mac, N8RBA, seconded the motion. Motion passed.

#### **OLD BUSINESS**

OPERATION CARE: There was a discussion as to which checking account the funds should be deposited in. Dave, KE8Z, made a motion to deposit the money into the Emergency Communication Fund. Mac, N8RBA, seconded the motion. Motion passed. Mac, N8RBA, gave us the real run down on what goes on during the mid-night shift. The stories brought laughter from all present. Thanks Mac for sharing "the rest of the story" with us. Thanks are also due to all who gave up some of their time for the good of the club. Also, special thanks goes out to Clairus, KC8QQN, the chairperson, for all the work she put into Operation Care.

#### NEW BUSINESS

FOX HUNT: Jim, WB8AZP, made a motion that the Program Director consider planning a Fox Hunt. After a discussion, Dave, KE8Z seconded the motion. Motion passed. Bob, K8VQC, will give a presentation on Fox Hunting at the October meeting. All those interested in this enjoyable aspect of our hobby should plan on attending this meeting.

YOUTH GROUP: Unless 10 kids show up for the next meeting the youth group will be cancelled.

ARES – RACES: There will be a class on October 4<sup>th</sup>.

PICNICS: Tim, WB8HRO, thanked Bob, K8PBA, and Rita, WA8IAQ, for doing the picnics.

CANOPY: Jerry, N8DY, gave a report about the end panels for the canopy.

NEW DIRECTORS: Jim, WB8AZP, will be Co-Program Director. Chuck, W8CLK is the new Technical Director.

REPEATER: Duane, N8WMN, brought up the problems with the Lima, Ohio and Canada repeaters. They were referred to Chuck, W8CLK, to look into.

50/50: We sold a total of \$66.00 worth of tickets. Mary, KC8SER, was the winner of \$33.00 and she immediately donated it to the Klub's General Operating Fund. She also won one of the many other door prizes, donated by Jim WB8AZP.

Mac, N8RBA, made a motion to adjourn. Dave, KE8Z, seconded. Motion passed.

Respectfully Submitted

Mary, KC8SER

## **SECRETARY'S REPORT**

### **BOARD MEETING**

Called to order at 7:45

Bob, K8VQC, made motion to accept Secretaries report. Melissa, KC8UTF, seconded motion. Motion passed.

Paul, KC8UKF, made motion to accept Treasurers report. Bob, K8VQC, seconded. Motion passed.

OPERATION CARE: It was reported that \$558.00 was made by the club. Clairus, KC8QQN, reported 100%

participated. A big thanks to everyone. Certificates were made for each donor.

Correspondence: The contract from Dave, KE8Z, for the storage area was received. Also, two tickets were received to a hamfest in Indiana.

Repeater: No report.

Technical Director: We had two volunteers, Jim, WB8AZP, and Chuck, W8CLK, for the position of Technical Director. After much discussion, Chuck, W8CLK, was appointed Technical Director and Jim, WB8AZP, assistant Program Director.

Fox Hunt: Bob, K8VQC is going to check with club members to see if there is any interest in having a Fox Hunt.

Youth Group: Paul, KC8UKF, is hoping to have 10 youth to participate. If not there will be no youth group.

Awards Banquet: No report at this time..

ARES/RACES: Emails were sent asking for volunteers to participate in a state exercise. We will use a phone list next time. More practice is needed at a slower pace.

Picnic & Swap: There was a discussion about a picnic and swap. No action taken.

Cabinet: A file cabinet has been donated to the club for the treasure to use. It will move from one treasure to the next with the records. The donor wishes to remain anonymous.

New members: A discussion was held on how we can attract new members. We are still working of this one.

Board Meetings: Board meetings will be held on the first Monday of the month, in the EOC library starting at 7:30 P.M.

Clairus, KC8QQN, made motion to adjourn. Melissa, KC8UTF, seconded motion. Motion passed.

Respectfully Submitted,

Mary KC8SER

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### L.A.R.K. DINNER

The next L.A.R.K. dinner will be Thursday, October 9<sup>th</sup>, from 5:30 to 6:45 PM, at The New China King, 1104 East Grand River, Howell. Hope to see you all there. We have a lot of good conversations! Please try to let me know if you are planning on attending, so we can give the restaurant a tentative count

33 and 73 Laurene WA8IAQ

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### WEIRD

Aoccdrnig to a rscheearch at Cmabrigde Uinervtisy, it deosn't mtttaer inwahrt oredr the ltteers in a wrod are, the olny iprmoetnt tihng is tahtthe frist and lsat ltteer be at the rghit pclae.The rset can be a total mse and you can sitll raed it wouthit porbelm. Tihs is bcuseae the huamn mnid deos not raed ervey lteter by istlef, but the wrod as a wlohe.

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### LARK MEETINGS / PROGRAMS

#### TALLYHO!

Once, only nobility and the very rich were able to enjoy the sport of Fox Hunting but today there is a new group of people who can participate. The new foxhunters don't go out on horseback – although they could – and they don't use a pack of dogs to chase the poor little fox all over the countryside. No, today's foxhunters are a little more technologically advanced and instead of horses and dogs, they use radio receivers and directional antennas. Fox hunting within the HAM radio community really means finding a hidden transmitter. Individuals or teams start from a specific location and then attempt to find a transmitter that has been hidden somewhere usually within range of their receivers.

Today's "FOX" is a low powered transmitter sending out messages. A controller periodically keys the transmitter and sends messages or identification usually using CW. The equipment used by the hunters can be very sophisticated or very simple but the basic idea is to determine the direction from which the signal is coming, head off in that direction, and keep at it until you find the "FOX".

In preparation for an upcoming Fox Hunt, we'll spend some time at the next LARK meeting talking about the process and some of the equipment used. We'll learn about things like triangulation, signal nulls, attenuators, multipath signal reception, and a whole lot more.

Foxhunting can be a very pleasant activity but it also has a practical purpose. Many Ham clubs or ARES/RACES groups have very active fox hunting teams who assist the Civil Air Patrol (CAP) in locating downed aircraft. All aircraft carry Emergency Locator Transmitters (ELT's) that activate when a plane crashes. These devices transmit on 121.500 MHz. and provide a signal to track much like the one used during a foxhunt. One of the repeaters in the mountains near Denver Colorado continuously monitors 121.500 MHz. When it detects an ELT signal, it sends out a special CW message that alerts the Fox hunting team. Fox hunting teams also assist in locating intentional repeater jammers, radios with a "stuck mike", or RF noise sources.

If you are an experienced foxhunter we could sure use your help. Please call Bob K8VQC at 810-632-4528. Any of you who have specially designed fox hunting equipment should bring it along to the meeting and share your experiences (the good, the bad, and the ugly) with the other Klub members.

Bob K8VQC

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## ACCIDENT REPORT

This one needs an introduction, so you won't be lost at the beginning. This man was in an accident at work, so he filled out an insurance claim. The insurance company contacted him and asked for more information. This was his response:

"I am writing in response to your request for additional information, for block number 3 of the accident reporting

form. I put 'poor planning' as the cause of my accident. You said in your letter that I should explain more fully and I trust the following detail will be sufficient. I am an amateur radio operator and on the day of the accident, I was working alone on the top section of my new 80-foot tower. When I had completed my work, I discovered that I had, over the course of several trips up the tower, brought up about 300 pounds of tools and spare hardware. Rather than carry the now unneeded tools and material down by hand, I decided to lower the items down in a small barrel by using the pulley attached to the gin pole at the top of the tower. Securing the rope at ground level, I went to the top of the tower and loaded the tools and material into the barrel. Then I went back to the ground and untied the rope, holding it tightly to ensure a slow decent of the 300 pounds of tools."

"You will note in block number 11 of the accident reporting form that I weigh only 155 pounds. Due to my surprise of being jerked off the ground so suddenly, I lost my presence of mind and forgot to let go of the rope. Needless to say, I proceeded at a rather rapid rate of speed up the side of the tower. In the vicinity of the 40-foot level, I met the barrel coming down. This explains my fractured skull and broken collarbone. Slowed only slightly, I continued my rapid ascent, not stopping until the fingers of my right hand were two knuckles deep into the pulley. Fortunately, by this time, I had regained my presence of mind and was able to hold onto the rope in spite of my pain. At approximately the same time, however, the barrel of tools hit the ground and the bottom fell out of the barrel."

"Devoid of the weight of the tools, the barrel now weighed approximately 20 pounds. I refer you again to my weight in block number 11. As you might imagine, I began a rapid descent down the side of the tower. In the vicinity of the 40-foot level, I met the barrel coming up. This accounts for the two fractured ankles, and the lacerations of my legs and lower body. The encounter with the barrel slowed me enough to lessen my injuries when I fell onto the pile of tools and, fortunately, only three vertebrae were cracked. I am sorry to report, however, that as I lay there on the tools, in pain, unable to stand and watching the empty barrel 80 feet above me, I again lost my presence of mind. I let go of the rope..."

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## WRITE TO SUPPORT THE FREQUENCY PROTECTION ACT

The Frequency Protection Act of 2003, IF PASSED, will



ensure Amateur Radio has adequate frequencies on which to operate. In short, the FCC will be prohibited from arbitrarily taking frequencies they have assigned to us away from us. Your help is needed to support this act which has been introduced into the US House of Representatives as HR 713 and into the US Senate as S 537.

The first action needed is to encourage as many representatives and senators as possible to cosponsor these bills. Many members of Congress will not consider co-sponsorship of comparatively small, technical bills like HR 713 and S 537 without concrete evidence of support from their own constituents. We Amateurs have not yet provided meaningful support of these bills. Now is the time to do it. Please help Amateur Radio make a statement on The Hill, by sending your Representatives and Senators letters asking them to be a co-sponsor. I'm doing this.

Too busy to send a letter? Send a QSL card that simply says "Support Amateur Radio. Cosponsor HR 713 or S 537."

Still too busy? Follow the instructions below to find your representative and senators and see if they list E-mail addresses.

Regardless of how you do it, please write.

To learn the names and addresses of your representative and senators, go to:

<http://www.house.gov/writerep/> Representatives.  
<http://www.senate.gov/contacting/index.cfm> Senators.

You will need to know your ZIP+4 postal codes.

When you write, be aware that the following already are sponsors of the bills. Please write to express your continued interest in the legislation and to thank them for being sponsors. The current sponsors are:

US House of Representatives:

From Kentucky: None  
From Michigan: Bart Stupak (1st Dist.)  
From Ohio: Paul Gilmore (5th Dist.), Ted Strickland (6th Dist.),  
Patrick Tiberi (12th Dist.)

US Senate:

From Kentucky: None  
From Michigan: None  
From Ohio: None

When you can take the time to write a letter, you can use the following sample letter as a starting point. Then insert information about Amateur Radio emergency activities or other benefits we have given to the state and congressional district. Don't have time to modify the letter? Simply remove the "localization sentence" and send it as a boilerplate letter.

NOTE TO CLUBS: Why not get in on the act and write as a club to Representatives and Senators in your members' districts? Be sure to include the number of members in your club in the letter.

NOTE: Please send a copy of your correspondence via e-mail to ARRL HQ at [specbill03@arrl.org](mailto:specbill03@arrl.org) and to [k8je@arrl.org](mailto:k8je@arrl.org). Thanks!

Sample Letters are:

Use this version to write to your congressperson (US Representative) regarding HR 713. It will be most effective if you customize this letter; however, if you do not have the time to do this, feel free to send it without the customization information. A version for your US Senator follows.

<YOUR NAME>  
<YOUR ADDRESS>  
<CITY, STATE ZIP>  
<DATE>

Dear Representative \_\_\_\_\_:

As one of the nation's more than 670,000 federally licensed radio amateurs, I urge you to co-sponsor HR 713, the "Amateur Radio Spectrum Protection Act of 2003," sponsored by Rep. Michael Bilirakis (R-FL).

This bill is a nonpartisan, non-controversial measure designed to help protect the radio frequencies used by Amateur Radio volunteers throughout our nation in providing emergency communications assistance during times of disaster. Most recently, radio amateurs have aided government and private relief agencies after the terrorist attacks of September 2001, during the severe forest fires which engulfed many parts of the Western United States last summer and during the huge power outage in the/northeastern part of the county just a few

weeks ago. In <your state or locality> Amateur Radio operators assisted <name of agencies served> during <name/describe the emergency in which assistance was provided>. When other means of communications fail, Amateur Radio operators very often become the only reliable source of communications for the effected areas.

Your co-sponsorship of HR 713 will help ensure that Amateur Radio operators have access to the needed spectrum, essential to their public service role. I look forward to hearing from you. Sincerely,

<YOUR SIGNATURE>

Use the following version to write to your senator regarding S 537. It will be most effective if you customize this letter; however, if you do not have the time to do this, feel free to remove the customizing sentence and send it as the boilerplate letter.

<YOUR NAME>  
<YOUR ADDRESS>  
<CITY, STATE ZIP>  
<DATE>

Dear Senator \_\_\_\_\_:

As one of the nation's more than 670,000 federally licensed radio amateurs, I urge you to co-sponsor S 537, the "Amateur Radio Spectrum Protection Act of 2003," sponsored by Sen. Michael Crapo (R-ID). This bill is a nonpartisan, non-controversial measure designed to help protect the radio frequencies used by Amateur Radio volunteers throughout our nation in providing emergency communications assistance during times of disaster. Most recently, radio amateurs have aided government and private relief agencies after the terrorist attacks of September 2001, during the severe forest fires which engulfed many parts of the Western United States last summer and during the huge power outage in the northeastern part of the county just a few weeks ago. In (your state or locality) Amateur Radio operators assisted (name of agencies served) during (name/describe the emergency in which assistance was provided). When other means of communications fail, Amateur Radio operators very often become the only reliable source of communications for the effected areas.

Your co-sponsorship of S 537 will help ensure that Amateur Radio operators have access to the needed

spectrum, essential to their public service role. I look forward to hearing from you.

Sincerely,

<YOUR SIGNATURE>

Incidentally, I got most of the information for this item from the ARRL web site, [www.arrl.org](http://www.arrl.org). Go there to learn more about this bill. When you get to the ARRL home page, search for Frequency Protection Act.

The main thing for you to do is to write your representative and senators. The more of us who write the more influence we will have. Please take care of this before you forget. Many thanks for your help.

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## K8OCL

### Used Amateur Radio Equipment for Sale

### All Gear is working and Sold AS-IS

10Meter FM Mobile Transceiver, 10 watts output - Alinco Model DR-M03 (Quantity 2) with mobile magnetic mount antenna

160-10M HF Transceiver, 100 watt output - Yaesu FT-757

2M FM HT Transceiver w/batteries and charger, 6 watts output - Icom IC-T2H

2M FM HT Transceiver w/new battery and charger, 1 watt output - Icom IC-2A

2M FM Mobile Transceiver w/TNC, 50 watts output - Alinco DR-135T/E

2M FM Mobile Transceiver, 50 watts output - Icom IC-2100H



70cm FM Mobile Transceiver, 35 watts output – Yaesu FT-4700

70cm FM HT Transceiver w/power supply (no batteries), 1 watt output – Kenwood TH-41BT

70cm FM HT Transceiver w/batteries, 100 mw output – Alinco DJ-S41

Floppy Drive Hewlett Packard OMNIBOOK laptop Model HP F1472A

Lithium-Ion Battery Module Hewlett Packard OMNIBOOK HP F1466A

12 VDC – 7A Astron Power Supply

12 VDC – 12A Astron Power Supply

9.6 VDC Battery charger/Eliminator – LR Taylor

Antenna Tuner MFJ Versa Tuner (100 watts) – MFJ 901B

PC P2 with CD burner and DVD viewer. Includes monitor, etc.

VOX Tape Recorder Optimus CTR-116

Power Strip West Mountain Radio RIG runner 4005 (6 outlets) Cassette

Automatic Voltage Regulator 220 & 110 VAC with International Adaptors

Automatic Voltage Regulator – Extremely Heavy Duty, Severe Service (Brown Outs) (90-150 VAC input = 110 VAC output) Wt. approximately 50 pounds!

RF Directional Wattmeter Dielectric 1000-A w/2-30 MHz 1000W & 400-1000 MHz 5W watt slugs

CB Radio SSB&AM, Lafayette Telsat SSB-50A w/manual and base antenna

FRS HT Midland Model 75-501

FRS HT Radio Shack Catalog No. 21-1815

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### VE TEAM NEWS:

Well, we held our every other month test session in September and for the first time we had no one show for an exam. I've been running test sessions between here and Texas for probably 7 yrs now or better (not consecutively) and this was the first time I have ever had a complete no show. Maybe the ARRL's plan to make things easy to get more members is not working. I know that having to compete with cell phones (especially the Nextel with the walkie talkie feature), and computers makes it hard to figure why any one would even want to be a ham. Hmmmmmmmmmm maybe a lot of it might have to do with the fact that making contacts on the air waves is kind of a challenge, not a sure thing like a telephone. There is a risk that the band might not be open, or maybe it is noisy from a close by thunderstorm; there are a lot of factors that can make it more of a challenge which believe it or not some people still enjoy, but I guess they will continue to do away with requirements for licenses until they no longer exist.

Well I hope for all our sakes that it works. I can picture somewhere in the future when terrorists strike our country again and take out all the computers and power, and the only way to get messages through is CW and there will be no one on the other end to receive it. Well to all who are interested there will be another exam session on November 11th at 7:00pm.

73 Greg AA5GO

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### ADDITIONAL NOTES FROM THE TREASURER.

Repeater frequency coordination dues have been paid. I appreciate each one that brought this to my attention.

I also wanted to send a special thanks to Mary KC8SER for her donation of the 50/50 drawing winnings.

As they say, no job is done until the paperwork is finished. The newspaper has now published a thank you letter for the local merchants that helped out with our Operation Care efforts. I would like to thank Chuck W8CLK for his hard work in creating certificates of appreciation for each of the merchants and personally delivering them. I think he had a motive behind delivering them to the Great Harvest Bakery 'cause they would not let him leave each store without a nice thick slice of their great bread. All of the merchants were delighted with the visit and award.

Thanks to Mary KC8SER and Irene KA8MVW for all their help with Operation Care. It is great to see so many step up to the plate and take action, and it didn't kill any of us. Hehehe. 73's

CLAIRUS KEEP  
KC8QQN



## What is HSMM Radio?

BY

John Champa, K8OCL

What is this HSMM stuff we hear about on the LARK repeater? What kind of radio do I need to use that? Is this something cool and fun that I might enjoy? Is it expensive? Can I afford it? Will I understand how it works? What can it do?

First, HSMM stands for High Speed Multimedia radio. It is not a specific operating mode, but more of a direction or driving force within amateur radio.

Second, HSMM, although digital radio, it is NOT primarily keyboard radio communication, as in packet radio. Amongst the capabilities of HSMM most used

locally in Livingston County are digital voice (DV) and digital video (ATV). Yes, you can type keyboard messages back and forth (chat mode) as in PSK31. You can also do file transfers as in RTTY, but at significantly higher speeds! Plus, if there is a server on the radio network, you can do e-mailing and maybe even surf the Internet by sharing a high-speed Internet connection with another amateur. That is why it is called multimedia radio.

NOTE: If you use one of the local HSMM repeaters to share high speed access to the Internet, don't forget amateur radio content restrictions, e.g. no porn, no commercial business e-mails, etc. Don't worry about pop-up ads. Pop-up ads, although a nuisance, are no more illegal than an ATV station transmitting an outdoor scene inadvertently picking-up a billboard in the station camera.

NOW WHAT? So you may ask, how can we use this? Imagine being at an emergency scene and being able to send live video images of what is happening back to everybody on the HSMM radio network, back to the EOC, and without using expensive ATV equipment. All that is often needed is just your laptop computer, a special PCMCIA card, your digital camera, and a small antenna. Except for the inexpensive special card and the antenna, you may already have all this gear!

So, now that you know what it is, how about a little history to show how it evolved?

### BACKGROUND

A survey conducted by the ARRL Technology Task Force, of League members and other amateurs revealed that the number one amateur radio interest in new technologies was in high-speed digital radio networks. Some suggestions were:

High-speed radio data links up to 20 mega bits per second (M bit/s)

Ethernet at 2 mbps on 10 GHz

Encourage development of a high-speed amateur digital radio network

High-speed digital audio/video radio

In January 2001, the ARRL Board of Directors voted unanimously that the ARRL should develop high-speed radio digital networks for the amateur radio service. The ARRL President appointed a group of individuals knowledgeable in the field from the international amateur community and industry. The group would report to the Technology Task Force, and its chairman is your fellow

LARK member and the author of this article. One of the work project leaders is Neil Sablatzky, K8IT, and Randy Beard, KC8MSB, Mark Williams, AB8LN, Larry Dopkowski, KB8QJE, Ernst Kiefer, N8EK, Rick Pugh, WR8W, Jim Kvochick, WB8AZP, Jon Harris, KC8VAB, and other members of LARK also play key roles. These were the humble beginnings of the High Speed Multimedia (HSMM) Working Group, and they are taking place right here in our own Livingston County.

## THE HSMM WORKING GROUP

The working group's first focus is on creating the skills within the amateur radio community that are necessary to build and support portable and fixed high-speed radio based local networking. That's where amateurs interested in HSMM radio can offer the most value to local RACES and ARES organizations, as well as to homeland security and other emergency communications efforts at the present time.

During Field Days and simulated emergency tests (SET) we encourage amateurs to hone their skills in doing rapid site-surveys and deploying broadband HSMM radio networks in the field. For example, some clubs put all their Field Day stations with their laptop-based log books onto one radio local area network (RLAN) so, for example, if you are working 20M you can see that the 15 meter band has just opened up because that tent's logging score is going through the roof (HI). You get the idea. Use your imagination. The possibilities are almost without limit.

In this process of everyday use of HSMM radio, we are trying to understand how to enhance the reliability of our mainstream radio network connections. Through various emergency communications training programs we will be trying to incorporate information to help local hams to be the people that deploy these high-speed microwave radio networks on demand.

One way you can become involved today is by adapting off the shelf IEEE 802.11 gear to operating within amateur radio regulations. This equipment is also known as WiFi equipment, and is commonly available at computer equipment retailers. As sold, the equipment operates in the 2.4 GHz ISM bands under part 15 rules. The 802.11b standard was developed about 6 years ago for the purpose of providing a wireless alternative for office LAN installations. This wireless capability was to allow office LANs to be deployed without the expense and nuisance of running CAT5 cable to each computer. Due to the increase of homes with multiple computers as well as rapidly falling price points for WiFi equipment, WiFi

hardware has had a significant penetration into the home market place. In fact, in a recent CQ survey (What You Have Told Us, CQ, September 2003, p.40) 8% of the respondents reported already using some kind of wireless networking, so there is already a growing understanding of the technology within the amateur ranks. A number of Livingston County amateurs already use WiFi in their homes.

The equipment as purchased has significant operating limits. Due to the Part 15 operating rules, power is severely curtailed. Remember, just like cordless phones, this hardware has to allow uncoordinated operation of many unlicensed devices with minimal interference. In addition, many users of this technology adopted it because it allowed unencumbered connectivity for a laptop computer. By nature of the fact that a laptop is battery powered, most client cards offer only a small fraction of the power authorized under Part 15 rules, in order to maximize battery life.

Depending on your needs, as an Amateur neither of these considerations is a limit on your use of the WiFi technology. While a system as sold may have a range of only 50 to 100 feet, proper setup of a system under amateur regulations can provide coverage far in excess of that distance. In fact, one of our HSMM Working Group's test networks, called the Hinternet, in Livingston County Michigan can easily do 5-15 miles ranges, at speeds of up to 54 M bit/s (half-duplex) using small mast mounted dish antennas in conjunction with off the shelf consumer grade hardware.

## GETTING STARTED IN HSMM RADIO

Getting operational with this equipment is a bit more complex than going to Universal Radio, buying an HF, VHF, or UHF rig and going home and connecting a key, microphone and antenna. Because this is data radio local area network (RLAN) equipment, it expects to be communicating with a computer, or more precisely with software running on a computer. So you first must decide what interfaces you are going to need to connect to your computer. Luckily, equipment is available for all the standard computer interfaces: Ethernet, USB, and PCMCIA.

If you use a laptop in your station, get the PCMCIA card. We recommend the type with an external antenna connection.

If you have a PC, get the WLAN (Wireless LAN) adaptor type that plugs into either the USB port or the RJ45 Ethernet port. Select the one best suited to your computer and your experimentation.

This is your heart of your new digital radio station. It is a computer-operated HSMM 2.4 GHz radio transceiver and it will probably set you back about \$60-\$80. It is usually easier if you start off teaming up with another ham radio operator living nearby, and do your initial testing in the same room together. Then as you increase distances going toward your separate station locations, you can coordinate using a suitable local FM simplex frequency. On our radio test networks we most often use 446.00 MHz, the National Simplex Calling Frequency for the 70cm band, for voice coordination.

Go to the local OfficeMax®, Radio Shack®, ABC Warehouse®, or other consumer electronics outlet and purchase some economical and readily available wireless local area network (WLAN) devices. We recommend that you select devices that state they comply with IEEE 802.11b and are WiFi compatible. Because these devices are made by numerous manufacturers each using different techniques to achieve the same thing, there were initial complaints about interoperability between devices of different manufacture. An industry group known as the WiFi consortium, was formed to provide testing and certification of 802.11b devices. If the equipment is WiFi certified, it will interoperate with any other WiFi certified equipment, thus easing your initial installation and troubleshooting by assuring that device compatibility is not the root cause of a start up problem. These devices operate on 2.4 GHz band using direct sequence spread spectrum (DSSS) modulation at speeds up to 2 mbps and complementary code keying (CCK) modulation for speeds of 5.5 and 11 M bit/s. Operating speed is automatically selected by the equipment based upon signal to noise and signal strength of the operating channel. These 802.11b devices are usually the least expensive, are the easiest to work with, and offer the good propagation.

If you can afford a few extra bucks, move up to the newer IEEE 802.11g devices. 802.11g is a relatively new standard that increases the speed of the channel from 11 M bit/s maximum to 54 M bit/s maximum. They also operate on the same 2.4 GHz frequencies, but use a form of modulation called orthogonal frequency division multiplexing (OFDM) to achieve the higher data rates. OFDM requires significantly more signal strength and signal to noise ratio in order to achieve 54 M bit/s

throughput but appears to tolerate multipath effects caused by radio signal reflections better than CCK modulation, so it may offer better propagation characteristics in certain cases.

When purchasing your equipment there are a few things to be aware of. First make certain the supplied rubber duck antenna(s) are removable and/or there is an external antenna port. If the device does not have an external antenna connection, check Don Rotolo's (N2IRZ) article in the February 2003 CQ for details on how to modify the device. Second, look at the radio specifications for the device. The transmit power and receive sensitivity varies widely among devices. Try to buy a device with the best (highest power and lowest receive sensitivity) specifications. The best generally available equipment has 100 mW (20 dBm) transmit power and -93 dBm receive sensitivity at 11 M bit/s, while the poorest specs are 25 mW (13 dBm) transmit power and -87 dBm receive sensitivity at 11 M bit/s.

Radio at these frequencies behaves the same as radio at any other: a 6 dB power increase will double effective range. Here we're dealing with a 12 dB advantage of the higher performance equipment versus the lower. In a small Part 15 home WLAN the difference is probably not noticeable. For our purposes operating longer distances under amateur radio regulations, a 12 dB difference is critical, and can make the difference between successful experimentation and frustration and failure.

If the device does have an external antenna connection, then go to any issue of CQ Magazine and look up Nema Electronics®, CableXperts® or other cable supply source and order an 18"-24" strain relief cable, also called a pig tail. Order the type of pigtail needed for your device. It will probably cost less than \$20. If you purchased a PCMCIA card, the pigtail will have a strange looking miniature antenna connector at one end, and should have a normal N-series connector at the other.

The first thing you will need to do is install the device in your computer. If you are using a PCMCIA or USB device you will need to install drivers. If you are using a device with an RJ-45 Ethernet interface, no drivers are needed for the device, but there are drivers needed for the Ethernet port in the computer. Additionally there will be a method to communicate with this device for configuration. The included directions will explain how to accomplish this.

After you load up the software drivers on your PC, you will have 2 choices for configuring the equipment: ad-hoc and infrastructure mode. For now, set the device for “ad hoc” mode, and set it to any channel between 2 and 5 (they’re in the correct portion of the amateur band). If all is operating correctly, the two cards (yours and your buddies) should see each other and set up a communication session. Once the cards are talking, you can share files between the 2 computers in the same manner as if the computers were hardwired together on a LAN.

Once you have the cards tested and know you have a connection between them, it’s time to add the outdoor antennas and see what distances you can achieve between the 2 devices. Hook up any external commercial (e.g., Comet ®) or home-brew 2.4 GHz antenna. Shop around where the AMSAT-OSCAR 40 guys buy their Mode-S antennas for some good designs. Keep in mind, the higher the gain of the directional antenna, the smaller the main lobe will be, so aiming a high gain antenna will be more critical than aiming a low gain one. Most 802.11 equipment has a utility included that shows signal strength and signal to noise ratio. Using this utility to monitor signal strength as you aim your antenna will be of great assistance in finding the optimal aiming direction. Remember these antennas are directional in both horizontal and vertical planes, so you have to carefully aim in both azimuth and elevation to get optimum signal at the receiver.

Another thing to keep in mind is coax. Coaxial cable losses at these frequencies are enormous. Don’t even try to use RG8 cable to connect between the device and antenna. You will need to purchase the best coax you can afford in order to keep line losses minimized. In fact the antenna coaxial cable will likely be the most expensive part of the entire station, as you will want to use the lowest loss type you can handle, e.g. LMR-400, etc.

That’s all there is to it. Best of all, you may not have spent more than \$100 so far, depending on what antenna hardware you have around.

Now point your antennas at each other, and fire away. At these power levels there is not much concern for RF safety, but if you are using a high-gain antenna, it is recommended you avoid standing directly in front of the business end while on the air.

Do remember that it’s your responsibility to properly identify your station during use. In the mode you are presently in, the ad hoc or direct station-to-station mode, the most common technique is to simply ID in-mode, i.e. if you transmitting voice, simply speak your call sign into the microphone. If you are transmitting video, just hold a QSL card up to the camera. Or, you can send a ping containing your call sign. Remember that as long as the RIC (radio interface card = short for a WLAN PCMCIA card used for HSMM radio) is operating, even with no traffic, the system is transmitting!

Depending on how close your ham buddy is to your location, how high and clear over the trees your antennas are (2.4 GHz doesn’t go through trees very well), the quality of the coaxial cable you are using and many other factors, you should be able to get several miles range. Remember, these HSMM radio devices are truly QRP and run only about 30-100 mw of RF output, so be resourceful and experiment often with different antennas, etc.

If your signals are not covering the path between you and the nearest other HSMM radio station, then open a copy of any edition of the ARRL Handbook and read the sections on antennas, transmission lines and UHF propagation. Consider putting the antennas higher, getting or building higher gain antennas, using lower-loss coaxial cable, etc. until the link is achieved.

You may also find a way to mount your gear at the antenna, and avoid the expense and loss of coaxial cable, too. This is another reason to consider devices that have Ethernet output. Standard CAT5 Ethernet cable can be run up to 300 feet with no loss. In comparison, USB can only be run 9 feet without a signal booster being installed. By using an Ethernet based device, it is easy to remotely mount the unit close to the antenna and run cheap CAT5 cable back to your computer.

Running higher power is an expensive last resort. Not just because it is a sound operating practice to run the minimum power needed to maintain the communications, but also because it is just good old-fashioned common sense. Be considerate of others who may be using the band, both amateur and non-amateur. Use only the power needed for the link.

## HSMM RADIO REPEATERS

The next step up the functionality ladder is to add a “repeater” to your system. More properly called wireless

hubs or access points (AP), this device will allow several amateur radio stations to share the network (and all the devices and circuits connected to it). An 802.11b AP will sell for about \$100 and 802.11g AP for about \$140. The AP acts as a central collection point for traffic, and can be connected to a single computer or to a network. It can also be used to allow several amateurs to share one high-speed Internet connection. The AP is provided with an ESSID, which is the name it broadcasts. For our purposes, the ESSID can be set as your call sign, thus providing automatic, constant identification. To use an AP in your network the computer users have to exit ad-hoc mode and enter infrastructure mode. Infrastructure mode requires you to specify the network the device belongs to. This is what the ESSID does: identify the AP to its users, so the users can find the home system they belong to. Set your computer device to recognize the ESSID you assigned to your AP.

The AP can also be used as one end of a point-to-point network. For example, if you wanted to extend a network connection from one location to another, you could use an AP at the network end and use it to communicate to a computer at a remote location.

Using an AP allows more features and security than provided by ad-hoc mode. For example, most APs provide DHCP service, so they will automatically assign an IP address to the computers connected to the network. In addition, they provide filtering that allows only known users to access the network.

## HSMM SOFTWARE

For operating software, most amateurs are using Microsoft® NetMeeting collaborative software, which comes free with the Microsoft Windows® operating system. Other forms of open source groupware using Linux are also popular. Try using OpenH323 or Speak Freely. By connecting a microphone to the audio input of your soundcard, you can have digital voice QSOs. By connecting an inexpensive digital camera (\$20) you can do digital video QSOs. These are not the same quality as the usual ATV contacts, but the equipment is much less expensive! (HI)

## HSMM TRAFFIC

How do you keep Part 15 unlicensed traffic from accidentally using your Part 97 licensed HSMM network? A traffic separation technique that is considered acceptable

involves the use of WEP (wired equivalent protection)...NOT for encryption, but for authentication. If you use this approach under Part 97, therefore, you must publish the WEP key. We recommend that you ask that your HSMM repeater's WEP key be published on the HSMM webpage ([www.arrl.org/hsmm/](http://www.arrl.org/hsmm/)), or simply use the amateur common WEP key already designated on that webpage. Again, the WEP is used to avoid the accidental mixing of Part 15 and Part 97 traffic, i.e. authentication, NOT encryption. Another approach gaining in popularity with many HSMM stations is the use of 44 domain IP (Internet Protocol) addresses, which are only available to the amateur radio service.

## RECOMMENDATIONS

Amateurs of all license classes are encouraged, to get on the air with HSMM radio using 802.11 off-the-shelf gear under amateur regulations. It is easy, low-cost spread spectrum microwave radio experimentation. For more details and for the latest developments on all these initiatives, check out the link to HSMM WG open reflector at Texas A&M University on our webpage: <http://www.arrl.org/hsmm>.

## SUGGESTED READING

### Articles:

- Ford, Steve – WB8IMY, "VoIP and Amateur Radio," QST, February 2003, pp. 44-47.
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- Olexa, Ron - KA3JII, "Wi-Fi for Hams Part 1: Part 97 or Part 15," CQ, June 2003, pp. 32-36.
- Olexa, Ron – KA3JII, "Wi-Fi for Hams Part 2: Building a Wi-Fi Network," CQ, July 2003, pp. 34-38.
- Reinhardt, Jeff – AA6JR, "Digital Hamming: A Need for Standards," CQ Magazine, January 2003, pp. 50-51.
- Rinaldo, Paul L. – W4RI, and Champa, John J. – K8OCL, "On The Amateur Radio Use of IEEE 802.11b Radio Local Area Networks," CQ-VHF, Spring 2003, pp.
- Rotolo, Don – N2IRZ, "A Cheap and Easy High-Speed Data Connection," CQ, February 2003, pp. 61-64.

### Bios

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Gain Antenna Used For HSMM



PDA & PCMCIA Wireless Cards



PDA & Yagi Test Unit



Typical 802.11 Wireless Bridge

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## HOW TO SURVIVE A HEART ATTACK ALONE

Let's say it's 6:15PM, and you're driving home (alone of course), after an unusually hard day on the job. You're really tired, upset, and frustrated. Suddenly, you start experiencing severe pain in your chest that starts to radiate out into your arm and up into your jaw. You are only about 5 miles from the hospital nearest your home; unfortunately, you don't know if you'll be able to make it that far. What can you do? You've been trained in CPR, but the person that taught you the course neglected to tell you how to perform it on yourself.

Without help, the person whose heart stops beating properly, and who begins to feel faint, has only about 10 seconds left before losing consciousness. However, these victims can help themselves by:

- **COUGHING REPEATEDLY AND VERY VIGOROUSLY.**
- **A DEEP BREATH SHOULD BE TAKEN BEFORE EACH COUGH.**
- **THE COUGH MUST BE DEEP AND PROLONGED, AS WHEN PRODUCING SPUTUM FROM DEEP INSIDE THE CHEST.**
- **A COUGH MUST BE REPEATED ABOUT EVERY TWO SECONDS WITHOUT LET UP UNTIL HELP ARRIVES, OR UNTIL THE HEART IS FELT TO BE BEATING NORMALLY AGAIN.**

Deep breaths get oxygen into the lungs, and coughing movements squeeze the heart and keep the blood circulating. The squeezing pressure on the heart also helps it regain normal rhythm. In this way, a heart attack victim can improve their chances of getting to a

hospital. This technique could help  
save a life - yours!

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Truth is what is,  
Honesty is how you convey that truth  
to yourself and others,  
Integrity is how you live that truth  
when no one is watching.

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11 Oct 2003

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31 Oct-1 Nov 2003

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