

The **E-VOX**

The Official **On-Line**
Newsletter of the



**Lehigh Valley Amateur
Radio Club - W30I**



Allentown, Pennsylvania (Lehigh County) - USA

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Repeaters

146.340/146.940 (PL 71.9)

147.735/147.135 (PL 167.9)

Simplex: 147.420

RACES NET

Every Monday at 7:30 (ET)

146.34 / 146.94 (PL 71.9)

All are welcome !



W30I Home Page: <http://www.w3oi.org>



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The March Meeting will be held at the Red Cross Building at 7:30.

Program: "River Monitoring" - Rod (KB3HFZ)




LVARC / RACES NET

Don't forget to check into the Monday Night LC/LVARC/RACES Net on 146.94 (PL 71.9) with an alternate frequency of 147.735/147.135 (PL 167.9)
The Net begins at 7:30 pm local time (EST).

Many club announcements will be heard there !

Monday Night RACES/ARES Check In Summary 2004

<u>Month</u>	<u>Number of Check-Ins</u>	<u>Number of Mondays</u>
January	86	4
February		5





This Month In Ham Radio

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	ARES RACES Net 7:30 KB3GZV KB3GZW ₁	LVARC Meeting Red Cross 7:30				ARRL Int. DX Contest (Phone)
ARRL Int. DX Contest (Phone) 7	ARES RACES Net 7:30 NOKIA			YLISSB QSO Party SSB		RSGB Commwlth CW Contest Wisc. QSO Party ₁₃
RSGB Commwlth CW Contest UBA Spring CW Contest Wisc. QSO Party ₁₄	ARES RACES Net 7:30 N3MFT		St. Patrick's Day 		LVARC VE Test Session 7:00 pm	SARL VHF/UHF Contest Russian DX Contest AGCW VHF/UHF Contest ₂₀
SARL VHF/UHF Contest Russian DX Contest AGCW VHF/UHF Contest ₂₁	ARES RACES Net 7:30 AK3M					CQ WW WPX SSB Contest Oklahoma QSO Party CLARA & Fam QSO Party ₂₇
CQ WW WPX SSB Contest Oklahoma QSO Party 9K 15-Meter Contest ₂₈	ARES RACES Net 7:30 KB3CKD			St. Patrick's Day 		

**LVARC Meeting - Tuesday March 2, 2004
6:30 pm at the Red Cross Building**
LVARC VE Test Session - Friday March 19, 2004 7:00 pm



PA QSO Party Gives Birth - submitted by Bob (WB3W)

Those of you that have worked the **PA QSO** party know that it is a real "fun" event, low pressured, and probably the most "polite" and "friendly" contest or event that you can work. It's popularity and good-natured attitude has prompted a new offspring contest encompassing all of the mid-Atlantic sections, and even stretching into Virginia.

The first annual **Mid-Atlantic QSO Party**, an old-fashioned QSO party focusing on the states of Delaware, Maryland, New Jersey, New York, Pennsylvania, Virginia, and West Virginia, and Washington D.C., will be held on May 8-9, 2004.

Participants from all corners of the world are invited to join the low-pressure atmosphere, have some fun, and maybe even win an award or plaque.

You can check out the details at <http://www.qsl.net/magso/> and also join their reflector mailing list to stay up to date on activities. Many of the current PC logging programs authors are feverishly working on new modules to their programs and are providing updates on this reflector mailing list.

The new QSO Party (nicknamed **MAQP**) is to provide an opportunity so that amateur radio operators can enjoy the fun of participation in a regional QSO Party, which combines many of the diverse interests and pursuits of active amateur radio operators.

It provides every amateur who participates the opportunity to enjoy the esprit-de-corps that comes from sharing a common bond that has been exhibited in the past during the **PA QSO** Party and extended into a larger regional area provided by the **MAQP**.

In short, the purpose of the **MAQP** is for each amateur radio operator to have fun, enjoy the event, and seek whatever level of participation they desire.

Mark the date on your calendars and check the web site listed above for the event rules and logging requirements.



LVARC Dinner Meeting Postponed until February 17, 2004

Severe weather forced the postponement of the LVARC dinner meeting which was scheduled for Tuesday February 3, 2004. The dinner meeting was postponed until Tuesday, February 17, 2004.



From an Estate

Donald Meinhart-N3FEA (SK)

Icom 746 with hand mic, power cord, owner's manual and shipping box \$800.00

Give Dentron SWR meter with radio or sell for: \$5.00

Astron 35 amp metered power supply \$90.00

MFJ 1622 portable antenna \$40.00

AEA PK-232 computer interface for Packtor, CW and RTTY \$75

Yaesu FC 757 automatic antenna tuner (10-160 meters) \$75

Dummy load \$20

Blue 20 amp power supply (basement) \$40

Small TV antenna rotor \$15

MFJ 432 memory keyer \$35

Small square speakers \$2.00 each

Plastic morse code key \$2.00

Crimping pliers in plastic case (basement) \$3.00

Cobra desk mic / CB stuff (basement) \$10.00

Turner blue / white hand mic CB (basement) \$1.00

Call Carolyn at 610-758-9747 if interested in any items listed.



LVARC VE Test Session Calendar

The Lehigh Valley Amateur Radio Club (W3OI) offers testing for amateur radio licenses and upgrades.



Testing is held the **third Friday of each month at the Red Cross Building beginning at 7:00 pm. REGISTRATION is necessary. To register, contact Mark (AK3M) at AK3M@rcn.com or call 610-865-9183.**

For the 2004 year, test sessions will be held on: **Friday February 20, March 19, April 16, May 21, June 18, July 16, August 20, September 17, October 15, November 19 and December 17.**



ANTENNAS and ACCESSORIES



http://www.antenex.com/c_search.asp?txtFunction=browse1&selFamily=...&selMarket=H&selApplication=...



RACES NEWS

Remember, ALL stations are welcome to check into the LC Monday Night RACES/ARES/LVARC Net but that does NOT mean you are a member of LC RACES. If LC should need RACES operators, **ONLY THOSE WITH ACTIVE RACES ID**

CARDS WILL BE PERMITTED TO PARTICIPATE! To officially join LC RACES, complete the form found on the club's web site and mail to Jeff (N3MFT). There is NO fee to join.





**2004 Dues Are Due
LAST NOTICE**

**DUES ARE DUE
THIS MONTH**

Anyone who does not pay dues will be dropped from the LVARC role and will be treated as a new member if he wishes to join after this month.

- Regular Dues (includes autopatch) \$17.00**
- Family Dues \$3.00**
- Associate (non-ham) \$5.00**

Send your dues to:

**Paul Ryan (NOKIA)
5814 Lindbergh Street
Orefield, PA 18069-2250**

**or pay Paul at the
January, 2004 meeting**

or pay at the club's web site.

**Make checks payable to:
The Lehigh Valley Amateur
Radio Club**

**** Please notify Paul of change of
address, email or phone
number(s) ****

**Why Join/Renew
Membership In
the LVARC ?**

**Why should you join the
LVARC? What do you get for
your membership? What does
the LVARC have to offer?**

You get great programs, a monthly newsletter, dinner meetings, soon to be Tech classes, Field Day, a terrific web site, informative, friendly members, a holiday party, special programs (Operation Ho Ho), participation in community activities, group ARRL purchases, a dedicated RACES/ARES program, pizza meetings, access to an autopatch and **much more!!**

**I'm gonna
re-new now !!!**

**LAST MONTH
TO PAY DUES**





LVARC Activities/Events

Mark your Calendar

PRINT, CLIP and POST



- Monday March 1 --- LC RACES/ARES Net - 7:30 pm (146.94)
- Tuesday March 2 --- LVARC Meeting - 7:30 PM (Red Cross Bldg)
- Monday March 8 --- LC RACES/ARES Net - 7:30 pm (146.94)
- Monday March 15 --- LC RACES/ARES Net - 7:30 pm (146.94)
- Friday March 19 --- LVARC ARRL VE Test Session - 7:00 pm
- Monday March 22 --- LC RACES/ARES Net - 7:30 pm (146.94)
- Monday March 29 --- LC RACES/ARES Net - 7:30 pm (146.94)

2
0
0
4

There will be additions and deletions to the above dates.
Listen to the Monday Night Net, the newsletter and
announcements at meetings for changes.

Proposed LVARC 2004 Programs/Activities (This is only a PROJECTION of activities-subject to change)

- March** - Rod (KB3HFZ) - **River Monitoring**
- April** - Lou (KF2WO) - **HF Tubes**
- May** - Frank (W3FTU) - **Old Radio Restoration**
- June**
 1. **Preparation for Field Day** - at the business meeting
 2. **Field Day - June 26 & 27, 2004 (Camp Serranova)**
- July** - Paul (NOKIA) and Robin (KB3GZV) - **Aviation Communications**
- August** - Bob (N3QZR) - **Echolink**
- September** - TBA
- October**
 1. **Nomination of officers for 2005**
 2. **Phil (KB3HMK) - Geocaching**
- November** - **Close nominations for officers**
- December**
 1. **Election of officers for 2005**
 2. **Operation "Ho Ho"**
 3. **Annual Holiday Party, 2004**



Need Small Emergency Lighting? de Mark (AK3M)

Check out *Lightblasters*. They provide unique small LED lights for various purposes. There are several mounts available, magnetic, suction cup etc. and come in various colors.

A good addition to your "Ready Bag or your pocket!" They also make call sign pins!



<http://www.fewture.com/lightblaster/>

DON'T FORGET

The LVARC VE program. If you know someone who would like to become a ham or if you want to upgrade your license, the LVARC can help!

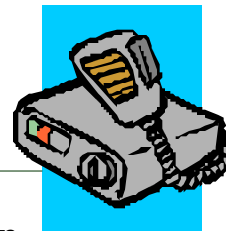
Contact Mark (AK3M) for details
(610-865-9183 or AK3M@rcn.com)





A Nice List of Local Repeaters for You to Save in Your HT or Mobile

courtesy Frank (W3FTU)



VHF

<u>Freq.</u>	<u>PL</u>	<u>Call</u>	<u>Location</u>
146.940	71.9	W3OI	ALLENTOWN
147.135	167.9	W3OI	ALLENTOWN
146.700	151.4	W3OK	NAZARETH
146.865	100.0	N3EFW	TANNERSVILLE
147.045	131.8	WA3MDP	BANGOR
145.310	-	W3AI	PERKASIE
145.190	-	N3ZA	TELFORD
145.490	114.8	K3TI	READING
147.210	-	K3DBD	POTTSTOWN
145.370	131.8	W3EEK	POTTSVILLE
147.030	-	W3QV	ROXBOROUGH
146.985	131.8	K2RF	SPLIT ROCK NJ
147.255	131.8	W3HA	JIM THORPE
145.210	123.0	WB3EYB	HARRISBURG
147.225	151.4	WA3VHL	ALLENTOWN WEST
146.910	-	W3BN	READING ECHOLINK

UHF

444.900	151.4	W3OK	NAZARETH
449.375	151.4	N3ZVR	PALMERTON
443.700	151.4	KA3HJW	WIND GAP
442.950	131.8	WA3BXW	SPRINGTOWN
444.250	131.8	WA3BXW	TANNERSVILLE
444.150	131.8	N3KZ	ALLENTOWN U.P.
442.100	131.8	N3KZ	BIG BOLDER U.P.
443.800	131.8	N3KZ	VALLEY FORGE U.P.
442.200	131.8	N3KZ	WILKES BARRE U.P.
442.850	131.8	N3KZ	PRINCETON NJ U.P.



WHOSE CLUB IS THIS ANYHOW? - submitted by Jim (KA3UQP)

Do any of us think about our club responsibilities? Do we just attend the meeting, have our coffee and donut and LEAVE?

Who sets up the chairs? Who makes the coffee? Who serves and then cleans the kitchen? Who puts all of the chairs back in storage along with the platforms, flag and PA system?

In brief, its WORK to hold a meeting for us. I would like to see everyone responsible for his own seating-- get a chair from the stack and put it back after the meeting.

How about the coffee and donuts we enjoy after every meeting? We just take it for granted that refreshments will be there.

Whose club is this? Its OUR club. We need everyone to help a little. Don't leave it up to "the other guy." Please, if you want coffee and donuts after a meeting, call an officer and let him know you will help.

Please spend a few minutes after the meeting to secure the room.

ARES - submitted by Jim (KA3UQP)

What is the AMATEUR RADIO EMERGENCY SERVICE (ARES) and what does it do? Sponsored by the AMERICAN RADIO RELAY LEAGUE (ARRL), ARES is prepared to provide emergency radio communications support for local public safety officials and relief organizations wherever and whenever required. ARES is normally called up by LEE County Emergency Management prior to State and County Emergency Management full activation and RACES callup. In emergency operations wherein Emergency Management is not involved, the ARES Emergency Coordinator (EC) may go directly to other County ARES organizations for additional manpower assistance, if required. When RACES is activated, ARES Communications Assistance Teams (CAT) can be provided, from other Counties, when requested by Emergency Management.

Each County has an ARES Emergency Coordinator (EC), appointed by the ARRL. We ECs participate in numerous ARES related activities that the reader is probably not aware of. Operations are via packet radio, 2 Meter Civil Defense repeaters and 75/40 Meter ARES Nets. Via packet radio, we are in constant touch with all South Florida Section ARES officials. Much informational traffic is handled via this media. A weekly South Florida ARES net on 75 Meters, for ECs only, provides us with updated information. ECs also receive a monthly newsletter from Newington in which various ARES operations throughout the country are discussed and information concerning the various agencies that are served is given. ARES members are kept informed via the weekly net on the 146.88 Civil Defense repeater and the monthly meeting at the LEE County Emergency Operations Center (EOC).

ARES Emergency Nets on 75 and 40 Meters have been activated a number of times since my appointment as EC. These have occurred during the serious flooding in the North Florida Panhandle and when several potentially dangerous tropical storms were approaching South Florida. Packet radio communications provided me with additional information, including storm tracking. Had any of these events required our assistance, I would have activated LEE County ARES on the 146.88 repeater.

Gil Gilpin, W3SRU-LEE County EC

(from the Ft. Myers Amateur Radio Club newsletter, the "Modulator")



LC RACES/ARES Net Control Operator Schedule



Feb 2	N3MFT (Jeff)	Mar 1	KB3GZV/KB3GZW (Robin/Dorian)
Feb 9	AK3M (Mark)	Mar 8	NOKIA (Paul)
Feb 16	KB3CKD (Greg)	Mar 15	N3MFT (Jeff)
Feb 23	KA3UQP (Jim)	Mar 22	AK3M (Mark)
		Mar 29	KB3CKD (Greg)



The weather is starting to get better. The days are getting longer and the sun is warmer every day. All this can only mean one thing A FOX HUNT!



The LVARC will be hosting its first Spring/Summer Fox Hunt in the near future. Get out those antennas, fill the tank with gas and once more, let's drive around the county and stuff ourselves afterwards all the while bragging how we *could have been first* if it wasn't for

Listen to the Monday Night Net and announcements at LVARC meetings for more information.



LV HF Net ?

Anyone interested in an HF Net for the Lehigh Valley? This net would NOT be limited to LVARC members, rather open to ALL hams in the Lehigh Valley. The net would also not be RACES/ARES related. Perhaps it could begin as an *informational* net and see where it goes from there. If you are interested in a participating in a such a net, contact Mark (AK3M) at AK3M@rcn.com.



E-VOX material Needed!!!

Have equipment for sale? Have amateur radio information to share? Have something funny to tell or show? Send your submission for inclusion in the newsletter to Mark at AK3M@rcn.com .



THINK ITS BEEN GOLD IN THE LEHIGH VALLEY?



Above, is a picture of ice on Little Egg Harbor on January 17, 2004. When salt water freezes, its COLD!



Keep Your E-Mail Current



In order to continue to receive e-mail regarding the LVARC, please be sure that your e-mail address is current.

If you have changed your e-mail address or if you have not received e-mail from me (Mark - AK3M) and you are currently a member of the LVARC, please contact me at AK3M@rcn.com and/or Paul at NOKIA@arrl.net .



ARRL to Propose New Entry-Level License, Code-Free HF Access

NEWINGTON, CT, Jan 19, 2004--The ARRL will ask the FCC to create a new entry-level Amateur Radio license that would include HF phone privileges without requiring a Morse code test. The League also will propose consolidating all current licensees into three classes, retaining the Element 1 Morse requirement--now 5 WPM--only for the highest class. The ARRL Board of Directors overwhelmingly approved the plan January 16 during its Annual Meeting in Windsor, Connecticut. The proposals--developed by the ARRL Executive Committee following a Board instruction last July--are in response to changes made in Article 25 of the international Radio Regulations at World Radiocommunication Conference 2003 (WRC-03). They would continue a process of streamlining the amateur licensing structure that the FCC began more than five years ago but left unfinished in the Amateur Service license restructuring Report and Order (WT 98-143) that went into effect April 15, 2000.

"Change in the Amateur Radio Service in the US, especially license requirements and even more so when Morse is involved, has always been emotional," said ARRL First Vice President Joel Harrison, W5ZN, in presenting the Executive Committee's recommendations. "In fact, without a doubt, Morse is Amateur Radio's 'religious debate.'" The plan adopted by the Board departs only slightly from the Executive Committee's recommendations.

The "New" Novice

The entry-level license class--being called "Novice" for now--would require a 25-question written exam. It would offer limited HF CW/data and phone/image privileges on 80, 40, 15 and 10 meters as well as VHF and UHF privileges on 6 and 2 meters and on 222-225 and 430-450 MHz. Power output would be restricted to 100 W on 80, 40, and 15 meters and to 50 W on 10 meters and up, thus avoiding the need for the more complex RF safety questions in the Novice question pool.

"The Board sought to achieve balance in giving new Novice licensees the opportunity to sample a wider range of Amateur Radio activity than is available to current Technicians while retaining a motivation to upgrade," said ARRL CEO David Sumner, K1ZZ. "It was also seen as important to limit the scope of privileges so the exam would not have to include material that is inappropriate at the entry level."

As an introduction to Amateur Radio, the Novice license served successfully for most of its 50-year history. The FCC has not issued new Novice licenses since the 2000 license restructuring, however. Under the ARRL plan, current Novice licensees--now the smallest and least active group of radio amateurs--would be grandfathered to the new entry-level class without further testing.

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Anticipating assertions that the new plan would "dumb down" Amateur Radio licensing, Harrison said those currently holding a ticket often perceive the level of complexity to have been greater when they were first licensed than it actually was. "Quite frankly," he said, "if you review the questions presented in our license manuals throughout the years, you will be surprised how they compare to those of today."

Technicians and Generals

The middle group of licensees--Technician, Tech Plus (Technician with Element 1 credit) and General--would be consolidated into a new General license that no longer would require a Morse examination. Current Technician and Tech Plus license holders automatically would gain current General class privileges without additional testing. The current Element 3 General examination would remain in place for new applicants. ARRL already has proposed additional phone privileges for Generals in its "Novice reframing" petition, RM-10413, but the FCC has not yet acted on that petition.

Morse Code Testing Retained for Extra

At the top rung, the Board indicated that it saw no compelling reason to change the Amateur Extra class license requirements. The ARRL plan calls on the FCC to combine the current Advanced and Amateur Extra class licensees into Amateur Extra, because the technical level of the exams passed by these licensees is very similar. New applicants for Extra would have to pass a 5 WPM Morse code examination, but the written exam would stay the same. The League's plan calls for current Novice, Tech Plus and General class licensees to receive lifetime Element 1 (5 WPM Morse) credit.

"This structure provides a true entry-level license with HF privileges to promote growth in the Amateur Service," Harrison said. "It also simplifies the FCC database by conforming to the current Universal Licensing System (ULS) structure and does not mandate any modifications to it."

Sumner concurred. "The Board started out by recognizing that three license classes was the right number when looking down the road 10 or 15 years," he said. "We need a new entry-level license."

"On the other hand, there's nothing particularly wrong with the existing Extra class license," he continued. "The change in the international regulations notwithstanding, the Board felt that the highest level of accomplishment in the FCC's amateur licensing structure should include basic Morse capability."

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Sumner and Harrison say the current Technician entry-level ticket provides little opportunity to experience facets of ham radio beyond repeater operation. "The quality of that experience," Sumner said, "often depends on the operator's location."

Among other advantages, Sumner said the plan would allow new Novices to participate in HF SSB emergency nets on 75 and 40 meters as well as on the top 100 kHz of 15 meters. The new license also could get another name, Sumner said. "We're trying to recapture the magic of the old Novice license, but in a manner that's appropriate for the 21st century."

Proposal Includes "Novice Reframing" Band Plan

The overall proposed ARRL license restructuring plan would more smoothly integrate HF spectrum privileges across the three license classes and would incorporate the "Novice reframing" plan the League put forth nearly two years ago in a Petition for Rule Making (RM-10413). The FCC has not yet acted on the ARRL plan, which would alter the current HF subbands. The Novice reframing proposal would eliminate the 80, 40 and 15-meter Novice/Technician Plus CW subbands as such and reuse that spectrum in part to expand phone/image subbands on 80 and 40 meters.

The ARRL license restructuring design calls for no changes in privileges for Extra and General class licensees on 160, 60, 30, 20, 17 or 12 meters. Novice licensees would have no access to those bands.

See page 19 for the band proposals

**From the ARRL website
January 20, 2004**



ARRL
The national association for
AMATEUR RADIO

**Proposed Phone/Image HF Subbands
(Includes Novice Reframing Proposal)****80 Meters**

Extra: 3.725-4.000 MHz (gain of 25 kHz)
General: 3.800-4.000 MHz (gain of 50 kHz)
Novice: 3.900-4.000 MHz (new)

40 meters

Extra: 7.125-7.300 MHz (gain of 25 kHz)
General: 7.175-7.300 MHz (gain of 50 kHz)
Novice: 7.200-7.300 MHz (new)

15 meters

Extra: 21.200-21.450 MHz (no change)
General: 21.275-21.450 MHz (gain of 25 kHz)
Novice: 21.350-21.450 MHz (new)

10 meters

Extra and General: 28.300-29.700 MHz (no change)
Novice: 28.300-28.500 MHz (no change)

Proposed CW/Data-Exclusive HF Subbands (Includes Novice Reframing Proposal)

80 meters

Extra: 3.500-3.725 MHz
General: 3.525-3.725 MHz
Novice: 3.550-3.700 MHz

40 meters

Extra: 7.000-7.125 MHz
General: 7.025-7.125 MHz
Novice: 7.050-7.125 MHz

15 meters

Extra: 21.000-21.200 MHz
General: 21.025-21.200 MHz
Novice: 21.050-21.200 MHz

10 meters

Extra/General: 28.000-28.300 MHz
Novice: 28.050-28.300 MHz



Kids Tell All - about relationships!

HOW DO YOU DECIDE WHO TO MARRY?

You got to find somebody who likes the same stuff. Like, if you like sports, she should like it that you like sports, and she should keep the chips and dip coming.
--Alan, age 10

WHAT IS THE RIGHT AGE TO GET MARRIED?

Twenty-three is the best age because you know the person FOREVER by then.
--Camille, age 10

HOW CAN A STRANGER TELL IF TWO PEOPLE ARE MARRIED?

You might have to guess, based on Whether they seem to be yelling at the same kids.
--Derrick, age 8

WHAT DO YOU THINK YOUR MOM AND DAD HAVE IN COMMON?

Both don't want any more kids.
--Lori, age 8

IS IT BETTER TO BE SINGLE OR MARRIED?

It's better for girls to be single but not for boys.
Boys need someone to clean up after them.
--Anita, age 9



"And the #1 Favorite is....."

HOW WOULD YOU MAKE A MARRIAGE WORK?

Tell your wife that she looks pretty, even if she looks like a truck.
--Ricky, age 10



How to Prolong Lithium-Based Batteries



Battery research is focusing heavily on lithium chemistries, so much so that one could presume that all portable devices will be powered with lithium-ion batteries in the future. In many ways, lithium-ion is superior to nickel and lead-based chemistries and the applications for lithium-ion batteries are growing as a result.

Lithium-ion has not yet fully matured and is being improved continuously. New metal and chemical combinations are being tried every six months to increase energy density and prolong service life. The improvements in longevity after each change will not be known for a few years.

A lithium-ion battery provides 300-500 discharge/charge cycles. The battery prefers a partial rather than a full discharge. Frequent full discharges should be avoided when possible. Instead, charge the battery more often or use a larger battery. There is no concern of memory when applying unscheduled charges.

Although lithium-ion is memory-free in terms of performance deterioration, batteries with fuel gauges exhibit what engineers refer to as "digital memory". Here is the reason: Short discharges with subsequent recharges do not provide the periodic calibration needed to synchronize the fuel gauge with the battery's state-of-charge. A deliberate full discharge and recharge every 30 charges corrects this problem. Letting the battery run down to the cut-off point in the equipment will do this. If ignored, the fuel gauge will become increasingly less accurate. (Read more in 'Choosing the right battery for portable computing', Part Two.)

Aging of lithium-ion is an issue that is often ignored. Lithium-based batteries have a lifetime of 2-3 years. The clock starts ticking as soon as the battery comes off the manufacturing line. The capacity loss manifests itself in increased internal resistance caused by oxidation. Eventually, the cell resistance will reach a point where the pack can no longer deliver the stored energy, although the battery may still contain ample charge. Increasing internal resistance is common to cobalt-based lithium-ion, a chemistry that is found in laptops and cell phones. The lower energy dense manganese-based lithium-ion, also known as spinel, maintains the internal resistance through its life but loses capacity due to chemical decompositions.

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There are no remedies to restore lithium-ion once worn out. A momentary improvement in performance is noticeable when heating up the battery. This lowers the internal resistance but the condition reverts back to its former state when the temperature drops.

If possible, store the battery in a cool place at about a 40% state-of charge. Some reserve charge is needed to keep the battery and its protection circuit operational during prolonged storage. The most harmful combination is full charge at high temperature. This is the case when placing a cell phone or spare battery in a hot car. Running a laptop computer on the mains has a similar temperature problem. While the battery is kept fully charged, the inside temperature during operation rises to 45°C (113°F).

Removing the battery from the laptop when running on fixed power protects the battery from heat but some battery and laptop manufacturers caution against it. They say that dust and moisture accumulating inside the battery casing could damage the laptop. The dealers will be happy to provide you with a new pack when a replacement is needed a little sooner.

A large number of lithium-ion batteries for cell phones are being discarded under the warranty return policy. Some failed batteries are sent to service centers or the manufacturer, where they are refurbished. Studies show that 80%-90% of the returned batteries can be repaired and returned to service.

Some lithium-ion batteries fail due to excessive low discharge. If discharged below 2.5 volts per cell, the internal safety circuit opens and the battery appears dead. A charge with the original charger is no longer possible. Some battery analyzers (Cadex) feature a boost function that reactivates the protection circuit of a failed battery and enables a recharge. However, if the cell voltage has fallen below 1.5V/cell and has remained in that state for a few days, a recharge should be avoided because of safety concerns. To prevent failure, never store the battery fully discharged. Apply some charge before storage, and then charge fully before use



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All personal computers (and some other electronic devices) contain a battery for memory back up. This battery is commonly a small non-rechargeable lithium cell, which provides a small current when the device is turned off. The PC uses the battery to retain certain information when the power is off. These are the BIOS settings, current date and time, as well as resource assignment for Plug and Play systems. Storage does shorten the service life of the backup battery to a few years. Some say 1-2 years. By keeping the computer connected to the main, albeit turned off, a battery on the PC motherboards should be good for 5-7 years. A PC should give the advanced warning when battery gets low. A dead back-up battery will wipe out the volatile memory and erase certain settings. After battery is replaced, the PC should again be operational.

Simple Guidelines



Avoid frequent full discharges because this puts additional strain on the battery. Several partial discharges with frequent recharges are better for lithium-ion than one deep one. Recharging a partially charged lithium-ion does not cause harm because there is no memory. (In this respect, lithium-ion differs from nickel-based batteries.) Short battery life in a laptop is mainly caused by heat rather than charge/discharge patterns. Although memory-free, apply a deliberate full discharge once every 30 charges to calibrate batteries with fuel gauge. Running down the battery in the equipment does this. If ignored, the fuel gauge will become increasingly less accurate. The battery life will not be affected. Keep the lithium-ion battery cool. Avoid a hot car. For prolonged storage, keep the battery at a 40% charge level. Consider removing the battery from a laptop when running on fixed power. (Some laptop manufacturers are concerned about dust and moisture accumulating inside the battery casing.) Avoid purchasing spare lithium-ion batteries for later use. Observe manufacturing date. Do not buy old stock, even if sold at clearance prices.

About the Author

Isidor Buchmann is the founder and CEO of Cadex Electronics Inc., in Vancouver BC. Mr. Buchmann has a background in radio communications and has studied the behavior of rechargeable batteries in practical, everyday applications for two decades. Award winning author of many articles and books on batteries, Mr. Buchmann has delivered technical papers around the world. Cadex Electronics is a manufacturer of advanced battery chargers, battery analyzers and PC software. For product information please visit www.cadex.com.

<http://www.batteryuniversity.com/parttwo-34.htm>