

the

Monitor

November

The MRCS Officers

2012

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Next Meeting: Wednesday, Nov. 7 - Video 7 Meeting 7:30

Place: EAA Building, Mettetal Airport, Plymouth, MI

What's In This Issue:

Upcoming Midwest RC Society Swap Shop -
Lithium Polymer Batteries: What you need to know - October Midwest Meeting -
September Show and Tell - Upcoming Events

**Upcoming Midwest RC Society
24 Annual
R/C Swap Meet**

**Sunday, November 4, 2012
9:00 a.m. to 12:00 p.m.**

Location

**Northville Senior Center Community
Center
Northville, MI**

**Admission Charge
\$5.00 per person**

**(active duty military, kids under 12, and
women are admitted FREE)**

**Vendor Table Cost
\$20 - \$25 per table, depending on
location**

**The Vendor table cost includes on
admission, Vendor setup time is 8:00 a.m.**

**Advance table reservations are
HIGHLY recommended.**

Last year we sold out in advance!

**For Information call Rudi Reinhard
248-631-8205 or email
wwtbi@comcast.net**

Directions

**Take the 8 Mile Rd. Exit off of I-275 and
go west 2.5 miles on 8 Mile Rd. to
Center Street**

**Go south, left, on Center Street for 0.5
miles and then turn left, west, on Main
Street.**

**The Northville Senior Community
Center is located at 303 W. Main St. in
downtown Northville.**

**There is FREE parking in the back of
the building, off of Cady Street.**

**This is the BEST and LARGEST swap
meet in southeastern Michigan!**

Helicopter Frequencies

21, 27, 29, 39, 41

Sailplane Frequencies

11, 12

Lithium Polymer Batteries: What you need to know

Presentation to the Midwest RC Society
By Ken Myers

The sources are listed first. There are many **opinions** about Lithium Polymer battery care and feeding, and very few facts. The suppliers inflate their claims, present false information and the manufacturers are really unknown to the end users.

The following is the 'best practices' information as presented by the sources and compiled by Ken with other information he has garnered over the Internet, from flying associates and personal use.

Sources

Thunder Power FAQs:

<http://thunderpowerrc.com/html/faq.html>

Thunder Power Safety Warnings:

<http://thunderpowerrc.com/PDF/THPSafetyWarnings.pdf>

Thunder Power Battery Disposal:

<http://thunderpowerrc.com/PDF/DISPOSAL-OF-LIPO-BATTERIES.pdf>

Gens Ace Use and Care:

http://www.rc-battery.com/app/menu.php?op=show_tips&id=42

Charles Langley aka everydayflyer on RC Groups

Li-Po General Information



Li-Poly batteries should not be charged in or on a vehicle.

Reading a Li-Poly Label or Its Specifications



A Li-Poly cell's nominal voltage is stated as 3.7 volts. 11.1 volts is the nominal voltage for 3 cell Li-Poly battery. The fully charged voltage may be 12.45v (4.15v per cell) to 12.6v (4.2v per cell). It depends on charger.

The battery illustrated has a capacity (C) of 2200mAh (milliamp hours), which is 2.2Ah (amp hours). It is rated for a 25C maximum amp draw. 25 is the multiplier for the capacity (C) in Ah. The manufacturer or supplier sets the recommended discharge rate. The recommended maximum discharge rate for the example battery is; 25 (the multiplier) * 2.2Ah (the capacity) or 55 amps.

C-Rate	Minutes
1	60.00
2	30.00
3	20.00
4	15.00
5	12.00
10	6.00
15	4.00
20	3.00
25	2.40
30	2.00
35	1.71
40	1.50
45	1.33
50	1.20
60	1.00
65	0.92
70	0.86
75	0.80

The recommended charge currents for the example battery are;

2C normal: $2 * 2.2\text{Ah} = 4.4$ amps (30 minutes)

4C fast: $4 * 2.2\text{Ah} = 8.8$ amps (15 minutes)

5C max: $5 * 2.2\text{Ah} = 11$ amps (12 minutes)

The burst amps notation really means nothing.

Time is directly related to the C rate. It is the time it takes to empty or fill pack at a given static C-rate.

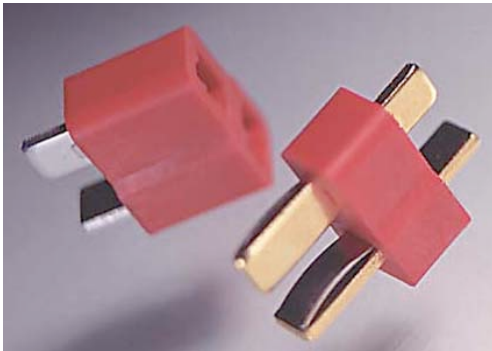
The example battery, when charged at a 5C rate, requires a charger output greater than $12.6\text{v} * 11$ amps or 138.6

watts.

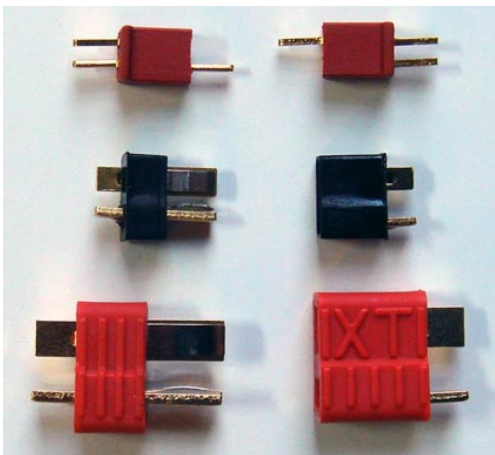
High charge rate Li-Poly batteries, when combined with a good charger, reduce the time required in the immediate area of a charger because the charge time is shorter.

Power lead connectors: Battery to ESC

Common types are the Deans Ultra and Deans Micro Plugs. Similar connectors, but NOT Deans are the ribbed XT, Mini T-plug and Micro.



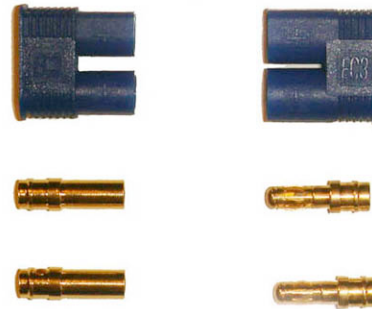
Deans Ultra



T-plugs



Anderson
Power
Poles - APP



EC3 similar to
larger EC5



JST aka BEC or
P connector
Used with small
planes and low
current
applications.



Bullet Connectors
are available in
various sizes
ranging from 2mm
and up.

Larger ones are
used for larger amp
loads.

They are not
totally inter-

changeable by brand.

They are most often used for motor to ESC connections, but they are also used for the battery to ESC connections in high amp applications.

4 Major Balance Plugs, Taps, Nodes or Node Connectors

Polyquest (PQ): Enermax, E-tec, Extreme Power, Fliton, Hyperion, Impulse, MaxAmps, Pache, Poly RC, Polyquest, True RC and Xcite

(above uses JST XH connector by skips pins)

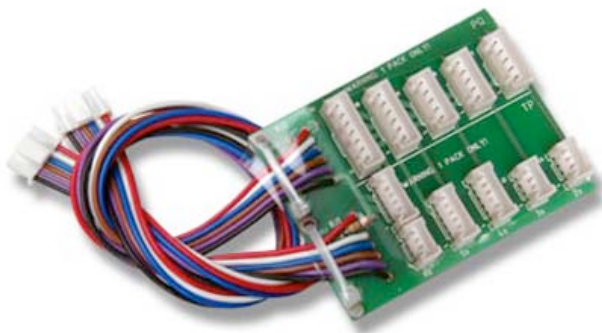
Thunder Power (TP): Apex, Danlions, EVO, Flight Power, Kong Power, MPX, Outrage, Tark Power, Thunder Power and Vislero

Align JST XH (AL): 3E Models, ABF, Air Thunder, Align, Common Sense RC V2, DN Power, Dualsky, Dynam, E-flight, Electric Power, Electrify, Energy EC, Esky, E-Watts, Exceed RC Fusion, Fully Max,

GE Power, Grayson Power, Hextronix, HI Model, Hobby City, Hobby Loong, Hurricane Flight Systems, Imax, LOSI, Mega Power, Mystery, PowerSource, Protec, Rhino, Tenergy (rev polarity), Tower Hobbies, Trinity, Turborix, Vampower (new), Venom and WOW RC, X-Caliber and Zippy

(above are obviously the most popular)

Kokam JST XE: Apogee (but you need to remove lock), Core, Graupner, Kokam, New / Neu Motors, Orion Avionics and Vampower (old)



Suppliers of chargers can supply adapter boards for various types of balance connectors.

Here's the RUB!

There is no standardization for power lead connectors or node/balance connectors. What works for the end user is “best”. For the moment, the leading balance connector type appears to be the JST-XH wired most negative to most positive with no pins skipped. The Deans and its “offshore” cousin, the “T-plug”, connectors seem to still have a bit of an edge, but they are no longer supplied on many of the popular batteries.



batteries, and the “banana” plugs on the Gens Ace are

A new “King of Power Lead Connectors” is on the horizon. The XT-60 (left), found on Hobby King



becoming popular, because they are supplied with their brands of batteries.

Li-Poly Storage and Safe Handling

Li-Poly batteries contain a lot of energy. They require special attention and care when in use and in storage.

It is best to charge them in a REAL Li-Po Sack brand sack. The Li-Po Sack Plus is a good storage vessel and can be used for transportation. A fireproof safe, ceramic dish with lid or ammo box also make decent storage vessels.



Li-Po Sack Brand Li-Po Sack Plus



Ammo box

Good Charging Practices and Safety Precautions

Li-Po batteries should always be balance charged using the node/balance connector with a charger designed specifically for Li-Po batteries.

Charge only out of the airframe.

Charge only in an isolated area, away from flammable materials and use a safety container such as a Li-Po Sack, Li-Po bunker, etc.

It is extremely important to NEVER charge lithium polymer batteries unattended!

Closely observe the charging Li-Poly batteries and charger.



If a battery swells during a charge, disconnect it immediately. Move the battery to safe observation area. Follow the disposal recommendation.

Shorts can cause fires. The ignition may be many, many minutes later. Place a shorted battery in safe observation area. Follow the disposal recommendation if necessary.

Don't charge packs with a RESTING cell voltage below 3 volts per cell. Follow the disposal recommendation to get rid of the pack. Note that that is a RESTING voltage of 3 volts.

Don't discharge a battery below 3v per cell UNDER LOAD. In other words, don't set an LVC circuit of an ESC to trip at less than 3 volts.

Never fly a Li-Poly to the ESC's low voltage cutoff (LVC) circuit's set point.

A punctured or ruptured battery may cause a fire. Follow the disposal recommendations but without discharge. Possibly, depending on where you live, burying it might be an alternative.

Do NOT deeply discharge a Li-Poly pack.

For longer Li-Poly Battery life, use the 80% Rule. Examples of the 80% Rule:

Stated 4500mAh * 0.8 = 3600mAh usable

Stated 3000mAh * 0.8 = 2400mAh usable

Stated 2250mAh * 0.8 = 1800mAh usable

Stated 2100mAh * 0.8 = 1680mAh usable

Stated 1800mAh * 0.8 = 1400mAh usable

Stated 1000mAh * 0.8 = 800mAh usable

Learning to fly to 80% Capacity

Step 1: fly the plane in a normal manner for about 3 minutes using timer.

Step 2: Land, remove the pack and charge it. Note the Ah/mAh returned to pack.

If mAh returned is greater than the 80% number, reduce the flight time. Repeat Step 1.

or

If mAh returned is less than the 80% number, add to flight time Repeat Step 1

Repeat Steps 1 and 2 until the normal flight time is established for the plane, flying style and the pilot.

What happens over 80%, say 82%? Nothing, that is close enough.

When to dispose of battery

While it is difficult to determine, a Li-Poly should be disposed of when the capacity has decreased by 20%.

If the battery is swollen or puffed it should be disposed of as soon as possible.

If the resting cell voltage has gone below 3 volts per cell, the battery should be disposed of.

If the battery has been shorted and results in any of the previous three conditions, it should be disposed of.

Battery Disposal

The chemicals used in Li-Po batteries are said to be "environmentally friendly".

To dispose of them in common household garbage, discharge the pack to less than 2.9v resting per cell. Even lower is much better, and 0 volts is ideal if possible. After discharging the pack, insulate the output wires and wrap the battery for disposal in the common household "garbage".

Storage

Store Li-Poly batteries at room temperature between 40 and 70 degrees F.

If the pack is going to be stored for longer than one week, it should be stored at a resting voltage

between 3.8V/cell to 3.9V/cell, which is approximately 50% charged.

Other Pertinent Li-Poly Information

New Li-Poly packs are shipped with approximately a 50% charge. A 50% charge shows a resting voltage of about 3.8v to 3.9v per cell.

Li-Poly packs puncture easily. Keep them away from sharp objects such as; bolts, screws or other sharp objects that might protrude into the battery area of aircraft. Secure the battery well in the aircraft.

Temperature Considerations

Operating Temperature

Charge: 32 to 113 degrees F

Discharge: 32 to 140 degrees F

Allow a battery to cool down to ambient temperature before re-charging.

During discharge and handling do not exceed 160 degrees F.

Performance and capacity decreases markedly below 50-deg F.

Li-Poly Use as Transmitter Batteries

Some folks have been using Li-Pos as transmitter batteries. That is probably not the BEST use for them, since they may require a voltage regulator, must be removed for charging and if a transmitter is accidentally left turned on, the battery will be ruined.

Sanyo Eneloop low self-discharge (LSD) cells are excellent for use in transmitters. They have a high capacity (2000mAh), hold their charge for weeks and can be charged with the transmitter's "wall wort" charger.

Eneloops are available at COSTCO or pre-made packs are available at No BS Batteries or Radical RC.

Ray'O' Vac call their version of LSD NiMH cells a Hybrid.

October Midwest Meeting

Arthur Deane started the meeting by reviewing the improvements to the flying field. He noted that the improved roadway may extend the current flying season and allow flying to start earlier next year.

The criteria for using the flying field during the winter months should be "**Do not leave tracks or ruts**". If the ground is soft and a cars leaves ruts, the field is not useable.

He reminded us that the area east of the Frequency Board is always softer than the area west of the Board, even though it is on higher ground.



The photo of the entry before it was 'fixed' reminds us of what **we do not want to happen!**

Scott Rellinger gave the treasurer's report. It looks like, with the proceeds from the Swap Shop, we should end up in the black. If you have questions concerning club finances, please contact Scott or any officer.

It was noted that **Lynn Morgan** had recently won the District IV sportman class for the year. **Verne Koester** came in a very, very, very close second in his last meet of the year.

Lynn Morgan headed up the Flying Demonstration for the Plymouth Cub Pack 293 on the evening of September 25, 2012. Lynn was assisted by **Jim Lapham, Larry Markey, Bill Brown** and **Arthur Deane**.



Our own Jim Lapham in scoutmaster uniform far left center



Bill Brown covers the basics of flight



Larry Markey flew his big, impressive Carbon Cub -
Smoke On!



‘Scoutmaster Jim’ shares his knowledge

The scouts made a very nice contribution to MRCS! Thanks!

Arthur opened the officer nominations by noting that all of the current officers have agreed to serve

again. Elections will be held at the November meeting. Remember that there is still time to nominate yourself for any position! The current officers:

President: Arthur Deane

Vice-President: Ken Myers

Secretary: Lynn Morgan

Treasurer: Scott Rellinger

Safety Officer: David Stacer

Field marshal: Bill Brown

Director: Jim Lapham

Director: Rich Sievert

Rudi Reinhard, Swap Shop Chairman, noted that 2/3 of the tables had been sold by the September meeting. We need help with the setup at 7 a.m. and tear down at noon. We also need people to man the coffee booth, admissions table, raffle ticket sales, club info booth and back door security.

It was also moved and passed that the \$25 initiation fee would be waived for folks who join at the swap meet.



September Show and Tell

Barry Jones shared his model of the ocean going tug, the “Irishman”. It is superbly detailed with many, many white metal fittings. The power system consists of a 12v starter battery and twin brushed geared motors with counter rotating props. The speed control has forward and reverse, with motor mixing capability. It was difficult to find a transmitter that

To change your email address contact Ken Myers at kmyersefo@mac.com

The 2012 membership application is available at the club Web site,
<http://www.midwestrcsociety.org>,
for downloading with the link on the homepage.

IMPORTANT: Channels 36 & 56 May NOT be used at the 7 Mile Rd. Field

Upcoming Events:

November 4, Sunday, Midwest Swap Shop from 9 - noon, see information in this issue.

November 7, Wednesday, Midwest monthly meeting. Aviation related Video at 7 followed by the monthly meeting at 7:30. The meeting is held at the EAA Building, Mettetal Airport, Plymouth, MI. The airport is at the intersection of Lilly and Joy roads and the EAA building is the first building on the right when entering the airport.

**Barry's Tug
Cont. from page 7**

could do it all. The hull is fiberglass with styrene and brass for the structures. The lights and spot lights are wired really work well. It looks fantastic, with or without the lights on. Great job Barry!



Midwest RC Monitor
Editor: Ken Myers
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The Next Meeting:

Date: Wednesday, November 7, 2012

Time: 7 p.m. video - 7:30 meeting

Place: EAA Building, Mettetal Airport, Plymouth, MI