

### **New Charger.**

The ORCA Lithium Battery 'Balance Charger' from BRC Hobbies is for 1-4S Packs and has a variable charge rate of 0.5 to 2A. This new charger is full of features to enable the safe charging of Lithium battery packs, particularly since it not only charges the packs but also balances the individual cells as it does so. The unit has a clear LCD screen which gives both a visual and numerical indication of the status and voltage of each cell within the pack throughout the charge period. You can select charge rates between 0.5 and 2 amps (in 0.5A segments), and the unit has auto cut-off when it is finished charging.

#### **SPECIFICATIONS.**

- \* Size 130x89x40mm
- \* Weight 219g
- \* Li-on/Li-Polymer Battery
- \* Input voltage 9-13v
- \* Input current: 5A DC
- \* Cooling fan
- \* Output Current: 0.5A - 2A (Adjustable)
- \* Auto-Cut off when battery cell fully charges
- \* Auto Charging Current Adjustment at Voltage Peak Region

The charger has JST-XH type ports for 2S 3S and 4S packs and includes a set of connector cables to enable various packs to be connected. It also has the ability to charge 2 x 2S packs at once!

A very useful charger for the safe charging and balancing of Lithium battery packs and available at a very reasonable price.

### **Orca LiPo Transmitter Battery.**

Also from BRC Hobbies, this is a 3S 2600 mAh Lipo battery designed to fit Futaba/JR transmitters. It is a small and light unit (98 mm x 23 mm x 30 mm and 150 gms) and has excellent capacity. It has been designed to operate at continuous low current (which is the kind of load created by a transmitter) and is not suitable for use as a power pack. It obviously needs to be charged using a suitable LiPo charger/balancer and NOT the normal charger supplied with the transmitter, and for safety it should also be removed from the transmitter for each charge. It is fitted with a standard Futaba type connector and simply plugs into the transmitter socket exactly as the original Nickel battery does.

An interesting development, which takes advantage of the higher energy density of LiPo batteries, this battery is maybe the forerunner of a move into wider applications for LiPos in the modelling world, but with all of the usual caveats regarding safety.

### **LiPo cell voltages.**

I have placed great emphasis in recent months on checking the individual cell voltages of series lithium packs to avoid imbalance. I have just enough space to include a little unit which is ideal for this and which is also available from BRC Hobbies. It is the HiModel 1 to 4S LED Lithium battery cell voltage checker. You will see from the photo that the tiny little unit is plugged into the balancing lead of a pack and it then begins to read the voltage of each cell in turn. At a rate of about 2 second intervals it scrolls through the cells (including an "error" reading for cells which are not present with 2S and 3S packs) and as you will see from the reading of 3.71(volts) in the photo it reads to two decimal places. It draws minimal current from the pack so can be left in place during a flight allowing readings to be checked before and after discharge. A very useful and remarkably low price unit.

### **Lithium Testing.**

There are no Lithium test results included this month. I am trying to keep some variation in the topics I cover each month (I try not to bore my readers too much), but rest assured, testing is on-going and more results will be available in due course. There are also a few modifications to the testing which I hope to make so that the range of packs is increased. An example of this is the need I have to increase the load unit capacity. When I set the 60-amp limit to the original ALU (Active load unit) I was thinking of the kind of current that flyers models might pull in sports flying. I should have realised that developments in Lithium cell production would increase both the capacity of individual cells and the maximum discharge rate. Since this latter value is expressed in multiples of the former (e.g. 25C) the manufacturers' limiting currents have shot up, and since I do need to test at the maximum loads the manufacturers allow, the original 60 amps is now a significant limitation to the test equipment. This is in hand however, and I will hopefully be able to use much-increased loads before long.

One other aspect of the testing, which you may be interested in, is the comparison element. Even allowing for the "disclaimers" I have included in previous columns (such as the amateur nature of my equipment compared to commercial test laboratories and the inherent danger of attaching too much significance to results based on single test samples), there has been a surprising amount of feedback. Most of this has been very supportive, and some, as I'm sure you can imagine in a competitive commercial world, has been less so. I'll leave it to you to guess which hat fits which head.

### **New NiMh batteries.**

The advent of LiPo batteries has been so staggering over the last couple of years that it feels strange to be working with a new brand of nickel cells. Many flyers are still happily using NiMH (and even NiCd) packs but the last time I tested any was back in November 2006. Manufacturers of these cells have been continuing their development programmes so that specifications have been steadily improving, and remember that there are some areas where NiMh cells still have an advantage over LiPos (e.g. cyclic life and robustness).

New manufacturers have appeared on the scene (mainly of Chinese origin) and they have matched (and in some cases exceeded) the products of the well-established sources. Enrichpower is one such organisation (produced actually by Shenzhen Vigor Power Battery Co., Ltd.) and Overtec have packaged these under their Tornado Professional label. The units included here are 2/3 AF size (17 mm diam. X 27 mm long) and have a rated capacity of 1500 mAh (it was only a few years back that the famous Sanyo 500AR of the same size had a capacity of only 500 mAh). Not only that, but according to the manufacturers specification this cell can sustain discharges up to 30 amps. You will see from the photographs that the cells are absolutely standard in size, weight, packaging etc. so it was simple to do some testing on the 8-cell pack I had available.

The pack was cycled a few times to bed it in and then subjected to discharge testing at currents up to 30 amps. As ever with the current crop of NiMH cells the capacity does seem a little low compared to the specified value but you have to remember that the specified value is based on a discharge rate of a mere 0.2C (0.3 amps). You will see from the data in the graphs that the pack was able to handle the discharge levels (up to 20C if we use the Lithium approach to discharge levels) without any obvious problems even if the voltage and capacity values were much reduced as the load increased. I did two additional discharges. One at 15 amps to allow a comparison with my previous 2/3 A test results (November 2006) as shown in graph 2, and one repeat run at 10 amps to check for any loss in performance which might have resulted from the high loads. In fact there was a slight loss, but only 2 or 3 %, so that seems to indicate that these are very durable cells.

The results of my test show that these cells are an excellent power source, particularly in applications which do not demand very high power outputs or extended duration. They are as good as the original sub-C NiCd's were (1200/1500 mAh cells), and at a fraction of the weight. Their application in sports flying is still well justified and they remain an economic approach to this area.

#### **Contacts.**

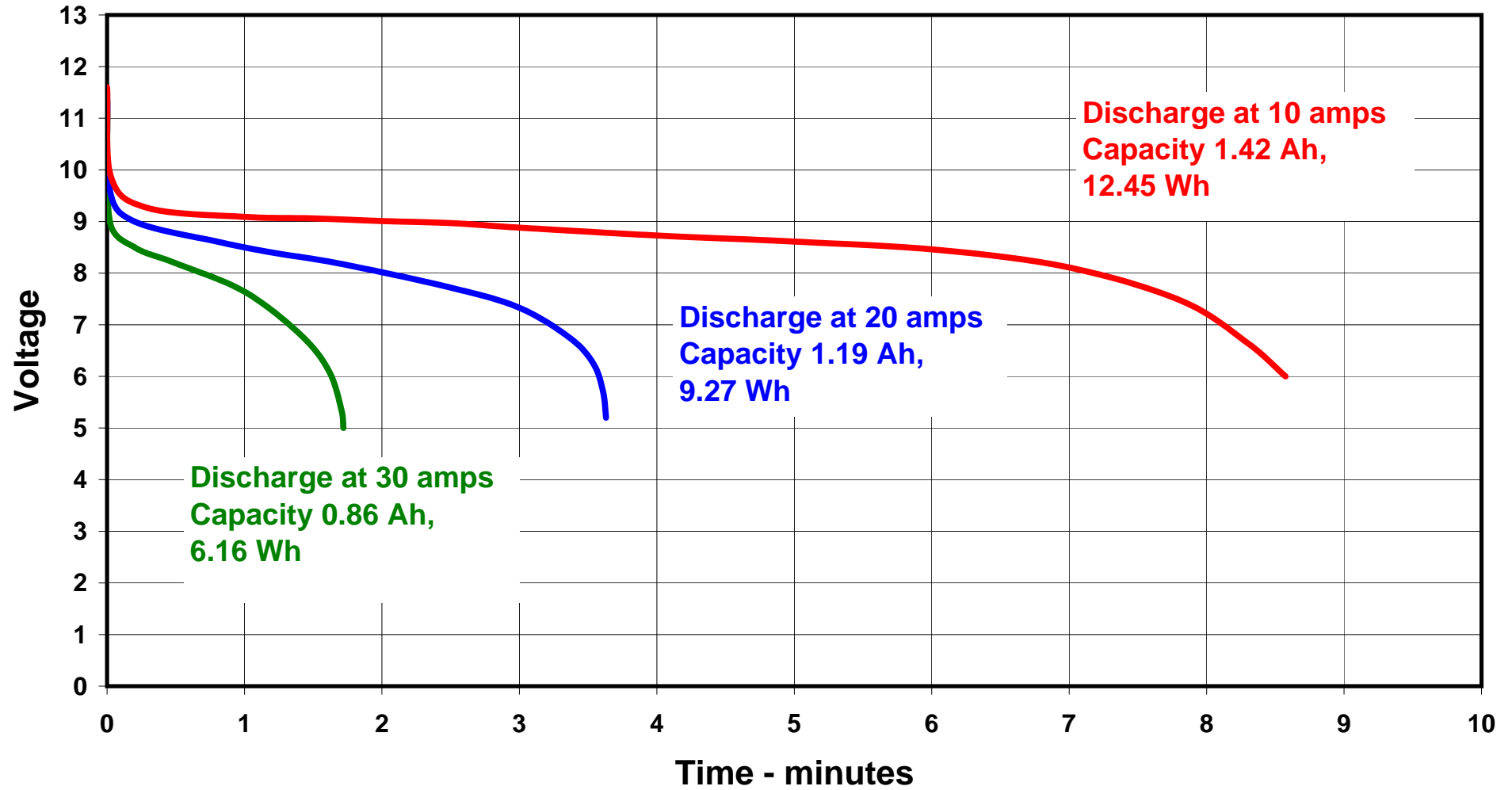
OverTec, Jesmond Dene Trading Estate, Forton, Nr Lancaster, Lancs PR3 0AT  
Tel 01524 793328 website [www.overlander.co.uk](http://www.overlander.co.uk)

BRC Hobbies, P O Box 226, Whickham, Newcastle upon Tyne, NE16 4WU Tel 0191 4887879,  
website - [www.brchobbies.com](http://www.brchobbies.com)

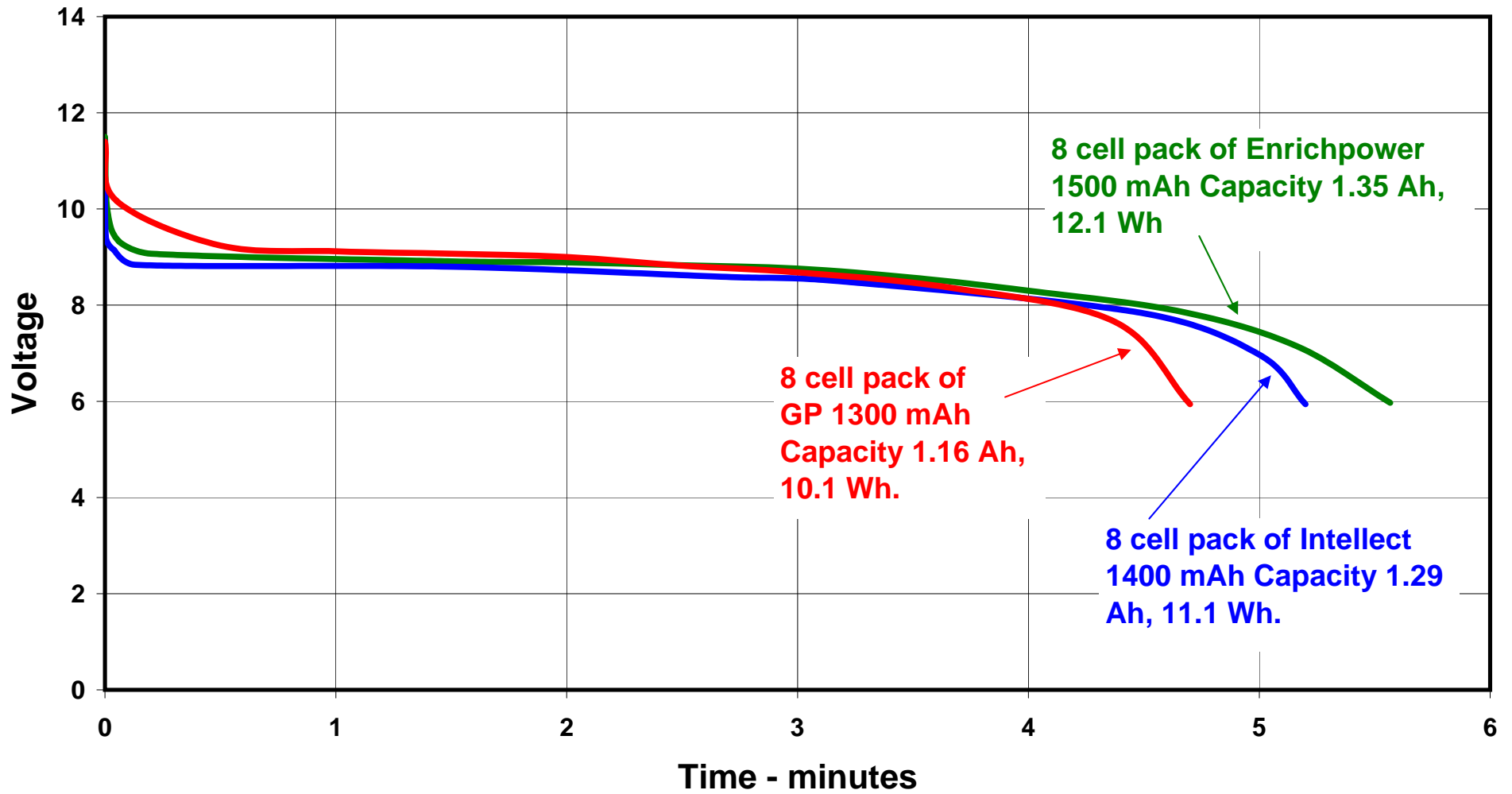
#### **Photographs.**

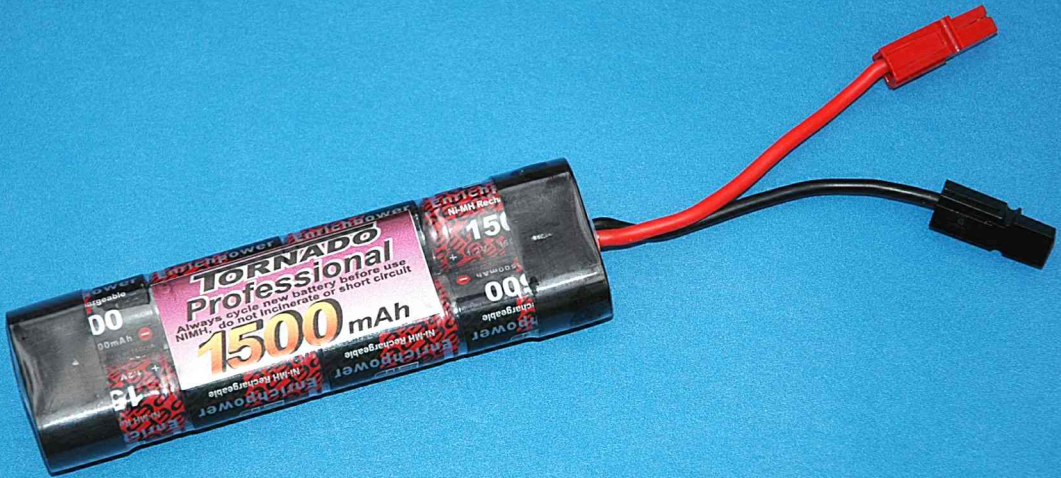
- QEFI69-1      The Orca LiPo charger/balancer.**
- QEFI69-2      The display screen of the Orca charger during operation.**
- QEFI69-3      The Orca LiPo Transmitter battery.**
- QEFI69-4      The BRC Hobbies HiModel Lithium cell voltage checker.**
- QEFI69-5      The Enrichpower 2/3 A NiMH cell.**
- QEFI69-6      The 8 cell Tornado Professional 1500 mAh pack.**
- QEFI69-7      A pair of the Enrichpower 1500 mAh cells.**

**Graph 1 - Discharge of Enrichpower 2/3 A NiMH 1500mAh 8 cell pack.**



Graph 2 - Discharge of 2/3 A sized cells at 15 amps





00  
00mAh

**TORNADO**  
**Professional**  
Always cycle new battery before use  
Ni-MH, do not incinerate or short circuit  
**1500mAh**

1500  
00mAh





**Orca**  
1.5 CELL LIPO BUCK PULS MODE M  
BALANCE CHARGER

Current Selection

**Graupner**  
**LIPO 2100**  
Beim 30  
7043.5  
11.1 V  
2.1 Ah

Nicht über 12.6V laden!  
Nicht unter 7.5V entladen!  
Nur Graupner LIPO-Ladegeräte verwenden!  
Maximaler Entladestrom 50A  
Anleitung und Warnhinweise beachten!





Powered Radio Controlled Model

1-4 CELL LITHIUM POLYMER  
**BALANCE CHARGER**

The LCD display shows three battery icons at the top. Below them are three voltage readings: 3.7V, 3.8V, and 3.8V. At the bottom left, it shows 0.0A. At the bottom right, there is a box containing the text 'P Charging'.

Current  
Selection





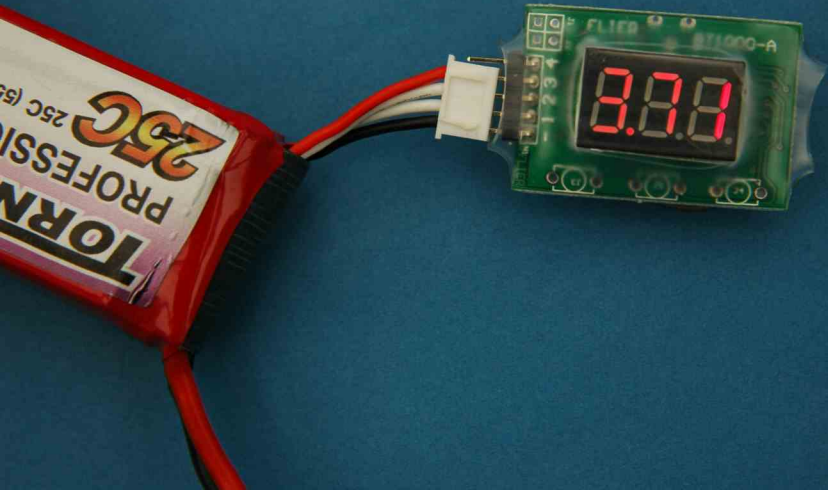
ORCA

Powered Radio Controlled Model

**Transmitter Li-Po Battery**  
Transmitter use only.  
With Over-Charge, Over-Discharge protection.  
Short Circuit protection.  
Use Li-Po charger for charge the battery only.

ORCA  
Powered Radio Controlled Model

11.1V / 2600mAh



TORN  
PROFESSIONAL  
25C  
25C (53)

FLIER  
BT1000-A

0.00

1 2 3 4 5



