



10, 9, 8...

The voice of UKRA!

Volume 4 Issue 1
March 2000

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Editorial

By Mark Perman



Welcome to the first edition of 10, 9, 8 for 2000. As you will notice we have tried to further improve the Newsletter with the addition of a few more pictures and adverts. Following feedback from the last edition those of you receiving copies by e-mail will receive the newsletter in pdf format, which considerably reduces the file size and decreases the download time. You will also notice that we have adopted a cover price. As in the past members will receive their Newsletter, however non-members will be asked to pay the cover price to help with the cost of publication.

In this edition you will find a number of interesting articles including the first part of an article by Ben Jarvis on a trip to a previous LDRS where he and Charles Simpson obtained their Tripoli level III certifications. Part two of this article will be in the next edition. In the last edition we ran a short piece by Pete Davy on the Challenger Centre and the simulated space missions they are running. If you are interested in attending a UKRA co-ordinated mission do let Pete know (for contact details see Pete's Rockets ad.)

I am very pleased to announce the formation of two new Rocket Clubs, The North Star Rocketry Group (see the launch report in this edition) and the West Lancs. Rocketry Society, contact details for both groups are in the contacts section. The future of our hobby lies with the formation of clubs. My experience is that clubs have less trouble obtaining and keeping flying sites than individuals and also with a club you get the fellowship and support that is so necessary in a small hobby such as ours. Don't forget a club flying day is far more interesting as there is that much more happening, than when a few individuals are flying on their own.

In the contacts section you will find a listing of UKRA members with their County /City location along with an e-mail address. If you want to correspond on rocketry matters such as where to fly in a given area these contacts are a good place to start. Incidentally if you would like your details added to this list just send in an e-mail and the list will be updated. This listing will also be appearing on the website soon.

Just a small point on what type of information is included in the UKRA newsletter. Any article included in 10,9,8... reflects the opinion of the author. This also covers any Hints and Tips that are suggested. UKRA can not be held accountable for any information or suggestion offered. Please do not hesitate to contact the UKRA editorial team on 01905 773 249 or by e-mail liz.mark@virgin.net if there is a specific point that you would like to address.

10,9,8... is the Voice of UKRA! That also means that it is the voice for the membership. If you have any articles, comments, club details or even a hint & tip that you would like to share then please send it to the editorial team.

I hope that you enjoy reading this edition and Liz and I look forward to meeting many of you at the various flying events during the year!

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National Rocket Championship

“Aiming for the Skies”



September 1999, marked the first AspireSpace National Rocket Championship (N.R.C) launch event, the aim of which was for competitors to produce and launch the best overall sounding rocket. It was the climax of a year of hard work for the three teams of university students and gave them the chance to see whether their designs worked as predicted. The event was held at the Davy family farm near the village of Heckington, Lincolnshire one of the largest areas's of uninhabited land available for the launch of amateur rockets.

The members of the teams, who were mainly undergraduate university students, learnt and refined a variety of practical skills that they don't often learn as part of their University Degree. Thanks to our donors who include Score (Europe) Ltd., and the help and enthusiasm of UKRA members, especially Liz and Mark Perman, Pete Davy and Charles Simpson, AspireSpace has been able to inspire part of the next generation of engineers, scientists and rocketeers.

The National Rocket Championship is well on its way to becoming an established annual event, supported by both (UKRA) and UK Students for the Exploration and development of Space (UKSEDS), with the intention of giving more groups the opportunity to tackle a number of challenges culminating in the launching and recovering of their own rocket. The N.R.C. 2000 is progressing well, with entries from five teams: Bristol, Canterbury, Cranfield and Leicester Universities and a combined Manchester University and UMIST team, scheduled to take place in September 2000.

The 1999 N.R.C. Launch Event

Teams from both Bristol University and the University of Kent at Canterbury had prepared rockets, which were all launched on K550 Aerotech reloads. One team had actually built their rocket for launch in 1998, but as no other team completed a rocket in the first year of the championship, it was decided to postpone launch until other rockets were ready. Thus Bristol University Rocket Team '98 (BURT98) launched along side their successors BURT99. By launching, BURT98 became the automatic

winners of the 1998 N.R.C. However, BURT99 had to compete against the Kent Amateur Rocketry Team '99 (KART99) for the 1999 Championship.

BURT98



BURT98 had a metal skinned airframe 102mm in diameter, with an overall length of 1.81m. The total mass was 5.6kg, giving a maximum predicted altitude of 6000ft. The original payload was an experiment to control the rate of roll of the rocket by the use of canards. Unfortunately the team were unable to finish the payload and thus the rocket was launched without a working experiment.

The rocket performed exactly as anticipated, with the parachute deploying near to apogee. The rocket came to rest safely having drifted for quite a distance in the light breeze.

BURT99



The size and method of construction for BURT 99 was similar to the previous Bristol team, having a diameter of 101mm and a length of 1.4m, weighing 6.9kg. However the rocket's main experiment was a novel recovery system that had the parachute contained in a fairing at the rear of the vehicle. The parachute was designed to deploy backwards, behind the rocket.

The rocket climbed perfectly, but unfortunately the recovery system did not deploy properly under flight conditions and the rocket returned ballistically

KART99



The Kent team created a carbon fibre and wood airframe, 1.32m long with a diameter of 101mm. The recovery parachute deployed out of a side hatch in the middle of the rocket. The vehicle carried an atmospheric data acquisition physics experiment that was intended to send data to ground via a telemetry link. Problems with this interface led to the telemetry system being used, but without experimental data being transmitted.

The ascent was perfect like all the N.R.C. rockets, however the recovery system did not deploy properly. The rocket returned ballistically again causing no third party damage.

AspireSpace relied on a panel of three judges to determine the 'best ' rocket. They based their decision on the rocket flights, by inspecting the teams' rockets and on the technical reports provided by the teams: For the 1999 N.R.C these judges were Ray

Turner, Chief Engineer (Space) of Rutherford Appleton Laboratories, John Harlow, formerly Head of Future Projects for Royal Ordnance and Mark Perman of Royal Ordnance, who is a committee member of UKRA. Primarily due to the standard of their report produced, KART99 were declared the winner of the NRC 1999. However the teams now realise that the greatest prize from the competition is the skills and experience that they have gained through all their hard work.

The event also gave AspireSpace the opportunity to hold a Rocket Workshop, which was run by John Bonsor and assisted by Kenny Bradshaw of STAAR (Space, Technology Applications, Astronomy and Rocket) Research, on the Saturday whilst the teams were still busy with their own launch preparations. The workshop introduced children as young as eight years to rocketry in a safe and well supervised environment demonstrating the physics of rocketry by building a small model rocket. Open to the public, the workshop had been primarily advertised at the local primary school in Heckington, although one Father and son had travelled from as far as Kingston, Surrey to take part.



The Feedback from the teams has been very encouraging, with many students voicing the opinion that the project has challenged and inspired them whilst also considerably improving their employment chances. For example:

Chris Goff (KART99): “the project has taught us more than we could have possibly imagined

Declan Burke (team leader of BURT99): 'I was told by the people who recruited me for my internship this summer that the rocket project looked really impressive on my CV --you want that if yours is one of 5000 CVs!.'

Kas Sanz (KART99 joint team-leader): “I've learnt more doing this than in my entire physics degree so far. Simply talking to the other members of the group and consulting experts for advice has taught us all so much...working with students from other disciplines to co-ordinate the various design aspects was particularly valuable. Every week we had meetings where members from a section of the team --- say aerodynamics or structure--- would present their work. Each section had to know about and understand what the others were doing in order that their work be compatible.”

Perhaps the true measure of the success of the N.R.C. is that two of the teams that competed in this year competition have already started preparing for next years contest, the AspireSpace National Rocket Championship 2000. In spite of their rockets failing to make ‘controlled landings’, they are determined that the N.R.C. 1999 will not be their last experience with rockets!

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UKRA 2000

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(Home of Thrust Rocket Club)

Following on from the great success of previous UKRA events we are pleased to announce our 4th Annual meeting.

Join us on Garlands 600 acre site where there will be entertainment for all and on site Rocket shops.

Our experienced Event Management Team will be on hand to answer questions or provide general assistance throughout UKRA 2000. The Range Safety Team will be operating sophisticated electronic equipment to help spot and track rockets. This service will be freely available to all participating flyers and we hope to adopt this system for future events.

All flyers welcome! The weekend offers:

Rockets up to J class flown **
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Drag Races
Range Safety Officers
On site workshop area

All flying during UKRA 2000 will follow the UKRA Safety Code.

** The motor class flown by any individual is subject to their UKRA Full Membership status and Certification Level. Full details are on our Web Site.

Please contact us for further details and directions or visit our Web Site on

<http://www.ukra.org.uk/index.html>

Change the Delay

By P Davy

If you need to change the delay in your re-load kit use the charts below to find the most suitable delay. The delay kits come complete with spacer rings if required. Please note that a medium delay in say a H123W will not be a medium in a blue thunder. This is due to the different burn times of the propellants. A good tip when changing delays is to place the delay you are not using (and spacer ring) in a self seal plastic bag with the RDK number

29mm RMS Delay					
Hardware	Motor	RDK-01	RDK-02	RDK-03	RDK-04
29/60	F37W		Short~6 sec	Medium~10 sec	Long~14 sec
	F62T	Short~6 sec	Medium~10 sec	Long~14 sec	
29/100	G54W		Short~6 sec	Medium~10 sec	Long~14 sec
	G104T	Short~6 sec	Medium~10 sec	Long~14 sec	
29/180	G75J			Short~6 sec	Medium~10 sec
	H128W		Short~6 sec	Medium~10 sec	Long~14 sec
	H238T	Short~6 sec	Medium~10 sec	Long~14 sec	
29/240	H97J			Short~6 sec	Medium~10 sec
	H180W		Short~6 sec	Medium~10 sec	Long~14 sec
	H220T	Short~6 sec	Medium~10 sec	Long~14 sec	
29/360	I200W	Currently only certified with a Long delay~14 sec			

38mm RMS Delay						
Hardware	Motor	RDK-05	RDK-06	RDK-07	RDK-08	RDK15
38/240	H73J				Short~6 sec	Medium~10 sec
	H123W		Medium~10 sec	Short~6 sec	Long~14 sec	
	H242T	Short~6 sec	Long~14 sec	Medium~10 sec		
38/360	H112J				Short~6 sec	Medium~10 sec
	I161W		Medium~10 sec	Short~6 sec	Long~14 sec	
	I357T	Short~6 sec	Long~14 sec	Medium~10 sec		
38/480	I154J				Short~6 sec	Medium~10 sec
	I211W		Medium~10 sec	Short~6 sec	Long~14 sec	
	I300T	Short~6 sec	Long~14 sec	Medium~10 sec		
38/600	I195J				Short~6 sec	Medium~10 sec
	I284W		Medium~10 sec	Short~6 sec	Long~14 sec	
	I435T	Short~6 sec	Long~14 sec	Medium~10 sec		
38/720	J350		Medium~10 sec	Short~6 sec	Long~14 sec	
38/1080	J570W		Medium~10 sec	Short~6 sec	Long~14 sec	

FAI Space Modelling.... Just "Spaced Out.."

by Stuart Lodge BMFA UK Representative on the FAI:CIAM Space Modelling sub-Committee

CONTEST SPACE MODELLING...What's that !? It's what the World does when it gets together to fly rockets. Rocket contests are about Performance and Quality...events based upon flight duration, altitude achievement and scale modelling.

FAI Rules ok...

The Federation Aeronautique Internationale governs international Space Modelling and an array of contest disciplines has come together over the past ~35 years. These are listed below :-

S1-Altitude	S2-Payload
S3-Parachute Duration	S4-Boost Glider
S5-Scale Altitude	S6-Streamer Duration
S7-Scale	S8-RC Rocket Glider
S9-Gyrocopter Duration	S10-Rogallo Duration
S11-Futuristic	

Other events originate from the National Association of Rocketry (NAR) in the USA. NAR classes include Egg Lofting - flown much like S3 - and Super Roc - an event for very long rockets. But we'll focus on the popular FAI categories e.g. S1, S3, S4, S5, S6, S7 & S8. Motor impulses vary, being 2.5Ns ("A") for S3 & S6...hence S3A & S6A and 5Ns ("B") for S1, S4 & S5...giving S1B, S4B & S5B and so on. S7 is flown on up to 80Ns impulse, giving scope for clusters, parallel & series staging and lots of motors..., all of which contribute to the flight score.

FAI competitions include the World Space Modelling Championships (WSMC) and the European Space Modelling Championships (EuSMC), alternating on a biennial cycle : Participation in these is the zenith of achievement in Space Modelling. In addition, there are Open International events in the Czech Republic, Slovak Republic, Yugoslavia, Slovenia, Macedonia, Poland, Ukraine, Germany, Switzerland, Turkey et al. The number of participating countries is increasing steadily. Open Internationals provide the venues

for Space Modelling's World Cup series, in categories S6A-Streamer Duration, S7-Scale and S8E-RC Rocket Glider, where points are accumulated throughout the summer, just as in professional cycling and skiing. There are 15 such events around Europe in 2000.

The Contests..

Duration contests are flown over a series of rounds, like Free Flight aeromodelling events. For S3A-Parachute Duration & S6A-Streamer Duration, a maximum time (max) of 300s & 180s respectively, is set to limit the impact of one lucky flight. Fly-offs are employed to break any ties. S4B-Boost Glider & S8E-RC Rocket Glider have maxes of 180s & 360s. Reading the air and spotting thermals is vital.

S1B-Altitude & S5B-Scale Altitude

These classes are also flown in rounds, but each flight is monitored by theodolite-equipped trackers, usually half a kilometre distant. At the rocket's apogee - or normally the ejection point, where coloured dye is spat out - the flight is marked and the altitude

Trigonometrically crunched.

S3A-Parachute Duration & S6A-Streamer Duration

Are flown with small, light rockets ! The FAI defines minimum size limits for contest rockets and in the case of S3A & S6A these dimensions are >350mm long and >30mm diameter for >50% of the overall length. Typically, these models are moulded from glass fibre or epoxyglass over a specially made mandrel...so thin that a newspaper can be read through the body wall. Particularly for S6A, low weight is vital and finished rockets of <5g are the norm at international level. Fins are cut from epoxy impregnated balsa and kept just large enough to provide stability - there is no one shape that appears to offer an edge...

The cutting edge comes from the recovery system. S3A parachutes are often cut from very thin ("quarter mil") aluminised Mylar or equivalent polyethylene sheet and rigged with up to 20 shrouds in thin thread. Diameters vary according to conditions and the air time being aimed at...700mm (28") diameter for 5 minute maxes and larger for fly-offs. S6A streamers are something of an art-form...thicker aluminised mylar is a common selection, the starting point being a rectangle of ~1000mm x 100mm... 10:1 aspect ratio. Pleating the Mylar and ironing-in the creases, concertina-like, is the next stage, usually for at least 2/3 of the overall length - Mrs Lodge reckons it's the only time Loggi lifts an iron ! Some modellers use simple pleats, others box pleats...all use some kind of pleats! There's a trend to use orthodox pleats for the 2/3 of the streamer nearest the model and rolling up the trailing remainder and ironing flat...producing the "Scorpion's Tail" format... This imparts a bias, or curl, causing violent flapping, retarding the model's descent.

Specialist motors are vital and Czech Delta, Slovakian Vypomo & Ukrainian MRD slug it out across the S-classes. Only 2.5Ns impulse is allowed - and statistical motor testing undertaken. For these light models...12-15g with streamer/parachute and motor, low thrust-long burn characteristics are needed - typically A2-5 & A1-5, as are altitudes of ~250m (~800')...

S1B-Altitude & S5B-Scale Altitude

The simplest objective in Space Modelling, to boost higher than the other guy ! S1B models have the same 350x30mm specification as S3A & S6A, but often look different as the class is best flown two-staged - the top stage at least 18mm in diameter. S5B is flown with scale models of dimensions >750mm long and >40mm diameter for >20% of the overall length. Typical sounding rocket prototypes include Nike Cajun, Nike Tomahawk, Taurus-Tomahawk & Dragon-III. Simple recovery systems - usually small streamers - are used for both sections of two-staged models.

A complete understanding of motor thrust-delay combinations is prerequisite in both S1B & S5B. Two-stage motor combinations for the former include A2-0+A2-7, 1NsA2-0+4NsA1-7...and others, remember the total impulse must not exceed 5Ns : Esoteric impulse combinations are specialities of these European manufacturers. Flown single staged, with a light streamer duration model, a B1-7 motor will get a good result. For S5B, similar pairings are employed, although as these scale models are bigger and heavier, more thrust is needed for the bottom booster: A7-0+A2-5 is a normal set.

S1B models can reach nearly 1,000m (>3,000') two-staged and 600m (~2,000') single-staged : Two-stage S5B prototypes reach 300-500m (1,000'-1,600'). And yes, it's better to go with two stages, because the bulk of the model can be dumped at an early stage, leaving the top-stage "pencil" to streak to apogee. Trackers are hard pressed to see these flights and it's normal to spoon coloured powder pigment into the top stage, to put a "splodge" in the sky at ejection, improving the chances of a score.

S4B-Boost Glider & S8E-RC Rocket Glider

Demanding but spectacular; the zip of a rocket and the grace of a soarer. S4B models used to resemble a chuck glider with a motor pod, but modern developments with variable geometry/wing area and slew-wings have made the class more complicated.

Fundamentally there are contradictions to overcome - Centre of Gravity (CG) locations at 50-70% wing chord for gliding flight would result in violent looping in the boost segment. The motor pod is set at the front of the glider, the loaded motor advancing the CG to near the wing's leading edge. It is usual to eject the motor at apogee, recovering the casing under a small streamer. Very lightweight radio control has recently been employed in S4B, although there are moves by the FAI to ban this development.

S8E is a radio controlled class, the gliders bigger and employing lightweight two-channel radio...by definition, they retain their motors for the entire flight. Russian research in this class has evolved folding wings and very exotic construction. Elsewhere, fixed wings are employed, with the models varying from traditional balsa/tissue, through to pressed foam wings and composite fuselage structures. As ever in Space Modelling, S4B & S8E models must be kept light for their performance to be competitive.

Propellant needs are low-moderate thrust motors with fairly long burn times. S4Bs load B2-2 or B2-3 motors and S8Es pack hefty E5-0RC units, the latter burning for nearly ten seconds...long enough for the best models to get to 300m (~900') : S8E is spectacular ! The skills of the pilots are vital, as they ride out the fizzing boost before seeking the best air to score maxes.

S7-Scale

Scale models of anything involve research, advanced constructional skills and megas-commitment...scale model rockets are no different. Degree of difficulty points tempt the modeller towards complex prototypes - Arianes, Saturns 1, 1B & 5 and Soyuz -

fill the judging halls at major events. And they've gotta be just perfect, right down to the last rivet; paintwork must be accurate and brilliantly applied and they must fly perfectly to display special effects. Dilatantes need not apply!! Seriously, S7's the big time !

Summary

Contest Space Modelling is a bit different - different skills need polishing and different kit accumulated. An example of the latter is the Tower launcher - or Rampa - which does away with the need for a launch lug, the rocket being supported between three parallel poles. Piston launchers are even better, where the rocket's motor locates on a cylinder containing a piston, pressure builds as the motor lights and the rocket effectively fired from a gun... Efficiency is the keyword in the craving for that last metre ! But there is a feeling that the performance in some classes - typically S1B & S3A - is vastly in excess of that required, leading to missed tracks and lost models. The FAI is in the process of reviewing the contest categories, in order that these be made more popular to young people. Many believe that contest space models should be much bigger, more spectacular and hence more exciting to spectators. Of events outside the FAI portfolio, Egg Loft duration under 10Ns is the commonest and most popular example. Occasionally this class is tagged on the FAI event suite in international events. It's flown just like S3A-Parachute Duration, normally over three rounds, with the better two scores counting. Oh yes, make a souffle and it's a ZERO !

FAI Space Modelling is serious, but the contests are the forum for international communication and lasting solidarity. The World's finest exponents of model rocketry are to be found on the World Cup circuit and the WSMC & EuSMC. You've just gotta boost it higher and keep it up longer than the other guy... And to think, some people use Viagra!

FAI World Records

THE COMPENDIUM of Space Modelling World Records are presented below. There is a question mark over some of these records...a few have been superseded, but I reproduce the array as it arrived from BMFA HQ:-

S1-Altitude S1A A. Mitiurev-USSR 21 04 87 974m S1B A. Mitiurev-USSR 23 04 84 1160m S1C Victor Kovalev-USSR 25 12 85 1194m S1D Vladimir Minakov-USSR 21 04 87 1396m

S2-Payload Altitude S2A Evgeny Christov-USSR 24 10 80 701m S2B Victor Kovalev-USSR 21 04 87 1357m S2C Evgeny Christov-USSR 25 04 85 1382m

S3-Parachute Duration S3A Igor Smatov-USSR 19 04 89 1h0m30s S3B Oleg Belous-USSR 23 04 85 53m48s S3C Sergei Illin-USSR 24 04 83 1h7m25s S3D Evgeny Christov-USSR 08 04 83 33m22s

S4-Boost Glider Duration S4A A. Stakhovsky-USSR 15 10 81 48m15s S4B V. Myakinin-USSR 15 10 81 32m19s S4C V. Myakinin-USSR 13 10 81 2h22m0s S4D

V. Myakinin-USSR 06 10 81 4h1m25s S4E L. Pienkowski-POL 30 05 98 4m21s S4F
V. Myakinin-USSR 13 10 81 3h28m0s

S5-Scale Altitude S5A Victor Kuzmin-USSR 25 04 85 422m S5B A. Mitiurev-USSR
21 04 87 772m S5C Vladimir Minakov-USSR 04 09 88 1545m S5D Sergei Illin-
USSR 21 04 87 1572m S5F Victor Kovalev-USSR 24 04 88 1635m

S6-Streamer Duration S6A Dumitru Tudorel-ROM 15 08 84 16m48s S6B Ivan
Lipovic-USSR 22 04 86 16m41s S6C Vladimir Kirov-BUL 31 08 81 18m44s S6D
Ivan Ivanov-USSR 23 04 87 11m08s

S8-Rocket Glider Duration S8A Piotr Malczyk-POL 03 05 91 22m04s S8B Krasimir
Tasev-BUL 13 05 84 11m43s S8C Emil Petrov-BUL 30 08 85 14m26s S8D Sergei
Ilin-USSR 24 04 88 27m40s And for [Radio] Control Freaks... S8E Gunther
Gschwilm-GER 20 06 92 36m55s S8F Alexei Koriapin-USSR 24 04 88 24m08s

S9-Gyrocopter Duration S9A Radojca Katanic-YUG 09 05 98 3m23s

S10-Rogallo Duration S10A Andrei Angelov-BUL 16 04 89 9m07s S10C Georgi
Lulev-BUL 23 04 89 4m25s S10D Ivan Ivanov-USSR 24 04 89 5m10s

When browsing through this array of excellence, take into account that many rule
changes have occurred since. Certainly in the case of S1, S3, S6 & S5, the records
quoted were set with much smaller models than are permitted now. And October 1981
was a pretty heady time to be boost gliding in the old CCCP...

British Records..

S1B-Altitude Stuart Lodge-GBR 19 09 97 569m (1850') @ World Air Games,
Ankara, Turkey

S3A-Parachute Duration Stuart Lodge-GRB 4 06 99 37m21s @ "2nd Giuseppe
Mazzaracchio Memorial" Mikulas Cup, Liptovsky Mikulas, Slovakia

S6A-Streamer Duration Stuart Lodge-GBR 22 08 99 3m46s @ BSMA Champs,
Yatesbury, England

NAR Helicopter Duration 2.5Ns Stuart Lodge-GBR 17 06 88 1m25s @ St Leonhard
Modellraketen Festival, Germany

NAR Helicopter Duration 5Ns Stuart Lodge-GBR 16 06 90 2m57s @ St Leonhard
Modellraketen Festival, Germany

NAR Helicopter Duration 10Ns Stuart Lodge-GBR 5m35s @ St Leonhard
Modellraketen Festival, Germany

NAR Super-Roc Duration 10Ns Stuart Lodge-GBR 17 06 88 7m38s @ St Leonhard
Modellraketen Festival, Germany

NAR Egg Loft Duration 10Ns Stuart Lodge-GBR 30 06 91 7m29s @ Cosford, England

I HOPE the following is of use too...2000 Calendar

13th World Space Modelling Championships for Seniors & Juniors Liptovsky Mikulas-SVK 10-17 September S1B-S3A-S4B-S5B-S6A-S7-S8E + World Cup

RAK2000, Oberkulm-CH 28-30 April S6A-S8E WC+S4B, S8E/P & non-FAI

8th Bratislava Cup, Bratislava-SVK 6-7 May S6A-S7-S8E WC + S8E/P & S9A

Stip Cup, Stip-FYROM 13-14 May S6A-S7-S8E WC+S4B

Sazena Cup, Sazena/Prague-CzR 20-21 May S6A-S8E WC + S9A & S8E/P

3rd Novi Sad Cup, Novi Sad-YUG 17-18 June S6A-S7-S8E WC + S9A

Yangel Cup Tie, Dnepropetrovsk-UKR 23-25 June S6A-S7-S8E WC + S4B

2000 Dupnica Cup, Dupnica-BUL 7-9 July S6A-S7-S8E WC+S3A-S4B

2000 Plock International, Plock-POL 14-16 July S6A-S7-S8E WC

1st Canterbury Cup, Stalisfield-Canterbury-UK 4-6 August S6A-S8E WC + S4A, S8E/P, S9A & non-FAI

2000 Prilep Cup, Prilep-FYROM 11-13 August S6A-S8E WC + S4B

2000 Henryk Szendzielorz Memorial, Rybnik-POL 18-20 August S6A-S7-S8E WC+S4B

2000 Liptov Cup, Liptovsky Mikulas-SVK 15 September S6A-S7-S8E WC *Event parallel with WSMC*

1st Beograd Cup, Belgrade-YUG 1--2 October S6A-S7-S8E WC + S9A

22st Ljubljana Cup, Kamnik-SLO 13-18 October S6A-S7-S8E WC + S3A-S4B-S5B & Show Models...and fun, fun, fun !!!

'For Queen & Country From London to LDRS to level 3...with a few detours.
By Ben Jarvis

September 20th 1992.

US Air flight US002 touches down at Gatwick Airport, London, England. On board is the UK model rocket team returning from the 'World Space Modelling Championships' in Florida. With the team is a very overexcited 16 year old who has, after meeting the local Florida prefecture of the 'Tripoli' rocketry association, discovered his true calling in life.....high powered rocketry.

That overexcited 16 year old was me.

A little over a month later I received my first issue of High Power Rocketry magazine, the monthly publication of the Tripoli association. It was the Nov/Dec 1992 issue with coverage of the 'LDRS 11' event at Black Rock desert in Nevada. I remember reading an article by a guy called Alan Cooper about his trip to this incredible event, without a doubt it's my favourite article that has ever appeared in that magazine. Reading that article on that day six years ago a flame was lit inside my head, one day, I promised myself, one day I would go back to America...and I would go to LDRS, the greatest rocket launch event in the World.....one day.

(Rapid passage of time with little comment to prevent article taking up a whole issue of '10,9,8' by itself.)

Antony Barton, my best rocket buddy, and me had planned to go out to LDRS together in 1994. Due to neither of us having enough money the idea was scrubbed.

Antony and I swore we'd go out to LDRS the next time it was at Black Rock. LDRS 14 was at Black Rock...it came and went...we didn't go because we didn't have the money.

Antony and I agreed we would go in 1997 because it was his 18th birthday and my 21st birthday, he would just have left school and I would just have graduated from University. Having just left University I was in debt and Antony also couldn't get the money....another LDRS passes us by.

(Please note the recurring theme.)

Before I even graduated I promised myself that the moment I had a job and could afford it I'd be going to LDRS...nothing was going to stop me this time.

At 'UKRA 97' the first annual flying event of the UK Rocketry Association I met this other rocket nut by the name of Charles, nice guy, cool rockets, cool camera (he was a photographer at the time.) He said to me "I'd really like to make it to LDRS some time, that would be really cool." In passing I mentioned to him that I had been planning to go for a long time and, money pending, I'd be going to LDRS 17 in 1998 with Antony. He said to keep in touch and let him know if we were going so he could tag along.

September 1997:

I met up with Charles again at a regional High Power launch. We got chatting some more about LDRS and he said he'd start making some enquiries about cost of plane

tickets etc and I said I'd look in to the event itself. I already knew that the event was to be held at Bonneville in 1998, I checked out the Tripoli web-site and other sites to try and get some more info. It suddenly occurred to me that BALLS was to be held the weekend before LDRS so being the Geography drop-out that I am I went to find an atlas to see how far Bonneville was from Black Rock. It looked about a six-hour drive, that wasn't so bad, the drive we make up to the Scottish Rocket Weekend is nine hours, plus we'd have two days in which to do it. Things slowly began to fall in to place.....

December 1997:

After talking it through several times Antony decides that he won't be able to afford to go. It's a real pity, we had planned on both going out there together for so long but I wasn't going to let it stop me, one way or another I was going to LDRS.

January 1998:

Certification.....

I have to take this opportunity to do my Tripoli Level 3 cert flight! I became Tripoli level 2 at UKRA 97 courtesy of Rolf Orell, prefect of Tripoli Sweden, there was no way I could really do a level 3 flight in the UK at the time so what better opportunity than a trip to Black Rock to do it!

Every rocket I build starts with a name a name and a 'feel' of the sort of character the rocket's going to have. My original Level 3 rocket which I designed back in 1997 was called 'Thunder Child', I loved that name, one of my other hobbies is storm photography so I thought it would fit just right, I even got as far as designing a logo, paint scheme, choosing a font for the name etc. Then I found out that Sue McMurray, head of Tripoli Motor Testing had already got a rocket called 'Thunder Child'! I was really annoyed, I couldn't use someone else's name, I'd have to find another!

I sat sketching out this new rocket on a rainy day in January trying desperately to think of a name what would sum up the whole experience and essence of a Level 3 cert, or any cert for that matter? Then it struck me....'Transient Glory'...it was perfect, I was happy again.

February 1998:

Charles has found that TWA seem to be the cheapest source for our tickets. TWA's hub is St Louis, what a coincidence! I have a friend in St Louis, I wonder if she'd be happy for us to drop in on our way through? Once again fate has dealt us an ace, she'd love for us to come and stay for a couple of days on the way. We need to make final arrangements and book these tickets as soon as possible.

I ring up Ky Michaelson who seems to be one of the head honcho's in the NERO / BALLS arrangement gang to ask him about Cert flights, motor availability and pre-registration. Once again everything looks good, plus Ky tells me about his plan to

launch two 'CATS' prize attempt rockets in to space from the desert on the 1st of August, the day before BALLS...This is gonna be cool!

March 1998:

So.....this rocket....just how scary is it going to be? I've built big rockets before, yeah, a level 3 rocket shouldn't be too hard...should it? The thing is...although building a level 3 rocket shouldn't be too hard....building one that can be carried several thousand miles in a suitcase is a little more difficult!

Charles checks with TWA and apparently we can only take two pieces of luggage and neither can be greater than 62" in total dimensions (i.e.: height plus length plus width can't total more than 62"!) I had already chosen the motor I wanted to use for the flight and this had a great effect on the design of the rocket. Everyone seems to use AeroTech M1419's and M1939's, great motors I'm sure but I have this thing about being different, come on...if you're travelling halfway round the world to certify you might as well do it with some style! The motor I had decided to use was the Kosdon M2240 Sledgehammer reload. It's only a very low 'M' but 1/4 ton of thrust for two seconds sounded pretty cool to me!

One way or another this rocket had to work and it had to stay together. My original design was admittedly a little over the top. I planned to use a 1/4" walled 4" dia aluminium tube for the airframe with a solid wood nose cone and welded-on aluminium fins. After some 'constructive criticism' from a number of people I decided to change the plan a little. Ok, so the next best thing, lets make a composite rocket. I've always wanted a Dynacom Rocket and have admired their hand made fibreglass products for some time so I sent an e-mail to Eric Haberman who I had spoken too on a number of occasions and asked his advice.

I sent him my initial sketches for 'Transient Glory', he also gave me some additional advice but generally thought that my design was sound. After considerable further discussion the order was made and the parts were shipped.

June 1998:

So...this package finally arrived.....I won't go in to a full construction description about the rocket but for the benefit of anyone else planning a level 3 I will give a very brief description of the principles behind the rocket. The overall principle behind the whole project was the 'K.I.S.S' principle (keep it simple stupid!)

Building the rocket strong enough to handle the boost phase didn't worry me too much, the Dynacom components were beautifully made and I built it with so much epoxy and glass cloth that there was no way even a Kosdon motor could break it.

The whole ethos of the project was to think of every thing that could possibly go wrong and make changes to prevent it. I had seen a lot of level 3 projects and similar sized rockets fly on imported HPR videos and read about them in HPR magazine so it was really a matter of analysing what methods work and what don't then applying that to my project. The area that seems to kill most rockets of this size and performance is

recovery. I immediately eliminated one thing that could go wrong by making the rocket single stage recovery. If you put two chutes in a level 3 rocket then both have to open perfectly and downrange drift is not exactly a major concern at Black Rock or Bonneville. The whole recovery rig was made using man-rated climbing gear. I used the 'anti-zipper' method on the separation point with a bulkhead on the top of the booster mating in to the bottom of the recovery tube with an electronics bay above the recovery tube with all charges firing downwards thus blowing the booster off the bottom in the way most rockets blow the nose off the top. I used 'U-bolts' on all recovery hard-points and I used three styrene 'shear pins' to secure the separation point during boost.

My parachute was a specially made 'lightweight' Pro-XP R12-C parachute from Rocketman which I ordered from Ky and arranged to pick up when I arrived at Gerlach, the small town on the edge of the desert where we'd be staying. For recovery electronics my theory was to go for extreme redundancy to get my single parachute deployed. I used a Cambridge IAX-96 accelerometer and a BSR Timer 2B. In total I had four deployment charges, set to fire in sequence. The first was to be fired by the IAX's apogee detection system, the second would be the first channel of the timer set to about two seconds after the predicted apogee, the third would be a larger charge set off by channel 2 of the timer set to four seconds after the predicted apogee and the final one would be a barometrically fired 'super-charge' fired at 2000ft by the IAX as a kind of 'last resort' in case the chute became jammed in the recovery tube.

Charles has decided that he too wants to do his level 3. At the moment he's only level 1 but figures he can do his level 2 closer to the actual time, or possibly even when he gets to the US. He decides on a similar design of rocket to me only using different construction materials. His rocket 'Pyrogenesis' is all constructed from aluminium and is slightly longer than 'Transient Glory'.

July 26th 1998:

After several panics, disasters and minor nervous breakdowns my level 3 rocket is built, painted, lacquered and ready for packing. I decided to take two other rockets with me to fly before and after my cert flight. The first was a modified LOC Aura called 'Ike' (Kick the baby!!!) Which had 1/8" phenolic fins and a solid nose cone. The second was a scratch built 2.6" rocket called 'Terminal Velocity' which had a double walled airframe and used an ACME fin canister with it's fins mounted through the wall of the 2.6" tube. This was designed to be capable of withstanding flight on a K550 and employed another IAX-96 accelerometer for recovery.

July 27th 1998:

Charles arrives from his home in Lincolnshire to help pack and get all our stuff ready. We drive in to central London to the offices of RDF television to pick up 'Death or Glory', a rocket Charles built for a TV show that he needs to use for his level 2 cert flight. We drive back to my house and he preps the rocket and loads up a J350W reload. Ken 'Bomb' Lau came round to see how we were getting on and we all bundled back in to Charles' car and drove to one of our local flying sites.

It was a beautiful English summers afternoon at Fryent country park....the early evening sun cast long shadows across the fields of gently swaying grass as insects flitted between the wild flowers. A tractor could be heard working the fields in the distance.....

5!.....4!.....3!.....2!.....1!.....LAUNCH!!!!!!! The beautiful evening calm was shattered



Charles 'Safety and Technical' Simpson uses the well known 'Smack it with an axe' technique of motor retention for his Level 2 rocket before we left for our epic trip.

by the sound of an AeroTech J350 tearing in to the sky as 'Death or Glory' lifted off for Charles' level 2 cert flight.....arcing over at apogee the huge heavy rocket lazily deployed it's chute at about 900ft and floated back gently in to the field.

I shook Charles' hand and signed his papers.....we were now both ready for level 3....look out America.....'Team Worry' are coming.....

Wednesday July 29th.....far too early in the morning.

The engine pitch begins to increase, the runway shimmers through the heat haze of the jet-efflux as we're pushed back in our seats by the acceleration. Twenty seconds later the runway falls away below us and 'Team Worry' bid a final farewell to Great Britain.

The hours pass agonisingly slowly. Sitting there at 30,000ft watching the icy coast of

Greenland pass below us I reached in to my flight bag and got out a tatty, plastic covered issue of 'High Power Rocketry' magazine. It was the Nov / Dec 1992 issue. I turned to page 23 and began reading an article by Alan Cooper...the same article that six years ago had started this whole adventure off. It seemed so long since I had first read those words and seen those pictures, so many years I'd dreamt about actually going...it was hard to believe that I was actually doing it....it was actually happening....I was going to LDRS.

Wednesday July 29th.....far too late in the evening.

Now I'm sure Springfield Illinois is a lovely place, but when you've been sitting cramped up on a plane for over ten hours you just don't need to be told that you're being diverted there because of a storm over St Louis!

Finally after hours of delay flight TW 720 touches down in St Louis. US customs don't seem too worried about the contents of the two wooden crates we have with us and half an hour later we emerge from St Louis airport and meet up with my friend Cory who gives us a lift straight to her parent's bar to meet her friends and have a drink or five. Those apple vodkas were sure nice.....

Thursday July 30th.....I think

I wake up to the sound of thunder, perhaps it's just my head? A fork of lightning strikes ground about half a mile away and the window shakes with another clap of thunder....Ok so it's not my head.

We spend the day sightseeing in St Louis, heading up the Gateway arch in an egg (really!) and visiting the headquarters of a rather famous brewery (the one with the toads). Charles and I are making a list of everything we need to buy when we get to Reno tomorrow.

Friday July 31st.....early in the morning again.

Back at St Louis airport we say our farewells and board our internal flight...destination Reno Nevada. The internal flight is quick and easy. As we're passing over Utah the pilot announces "If you look out of the left side of the plane you'll see the famous Bonneville Salt Flats." I stick the cam-corder as close to the window as possible and sure enough...stretching out below us is a vast expanse of white interrupted only by the arrow straight line of I80 stretching away to Salt lake city to the east and passing through Wendover to the west. The little 'entry road' which sticks out on to the flats is clearly visible from the video I shot.

We touch down in Reno late morning. The sun is beating down from a crystal clear Nevada sky. We pick up our rental car and head out in search of supplies. Scott Bartell gave us a few recommendations of things we must buy when we arrived, this included a BIG water cooler, some 'Gatorade' powder and a sun shelter.

Cruising through the shopping malls of downtown Reno we found the watercooler etc real easy but the shade was proving to be a real problem. We ended up in this bike shop talking to a cycle dude about 'Ez-up's and whether there was some kind of sunshade shortage in Reno. He said "Hey man, I know where you could try, 'Twin city surplus'." He gave us vague directions and off we went. After half an hour we finally pulled up outside a run down building which, according to the sign out front was in fact 'Twin City surplus'. We parked up and headed in. There was an armoured vehicle and a pile of ammo crates outside, something told me this was going to be a cool store!

I was certainly not wrong. The store had an air to ground missile hanging from the ceiling and not only did they sell sun shelters of every size and description, they also

sold Kevlar tape, camo' rip-stop nylon by the yard and chemical light sticks. We spent far too much money and headed out on the long road to Gerlach. To my amazement, we reached a junction in the center of Sparks and the left turn was actually signposted 'Gerlach'.



A rain storm hovers over Pyramid lake as we pass through the bleak Nevada terrain on our way to Black Rock.

Dark storm clouds hovered above the mountains around Pyramid lake as we drove through the stark Nevada terrain. Late afternoon and we drive through 'Empire'. In the distance is a dark mountain range sitting above a brilliant white expanse. As we get closer a tiny town is visible nestling at the foot of the mountains. A sign flashes past at the roadside, I catch the words 'Gerlach club'. I begin filming through my camcorder, I zoom in on the town in the distance, there in the middle of the street is a building with a stepped white roof "Charles...I think I can see Bruno's!" Charles is unconvinced. The telltale shape of that building is engrained in my mind and the closer we get the more certain I am that we're nearly there.....this is it...we're actually about to reach Gerlach.

A little fat dog lazily gets up and moves out of the way as we pull up outside 'Bruno's country club', probably the most famous motel in the history of rocketry and land speed records. I took a moment to just stand there and look up at the sign, trying to convince myself that I really was there. We stroll in to the bar and sit down. We glance around at the other people sitting in the dimly lit room trying to see any signs that some of them are out here on the same pilgrimage as us. I start chatting to Charles and after a while a young guy sitting with some friends on the other side of the bar gets up and comes over "You guys here from England?" He asks."Yeah, we're here for the BALLS rocket event" a smile of mutual insanity creeps across his face and he introduces himself and his colleagues. Apparently they're here from a University where they've been building a composite rocket with lots of complex electronics on board which they were hoping to fly on an M1939. Unfortunately it wasn't finished in time so they decided to just come out to watch.



Charles locks up the car out the front of the infamous 'Bruno's Country Club' just after we arrived in Gerlach.

After a while Charles and I get up and head to our room to un-pack. We open the rocket crates and begin to carefully inspect the components of our level 3 rockets to make sure no damage had occurred during the trip. Apart from a couple of minor paint scratches everything is fine.

We hang out in the bar as the sun sets over the desert, walking back to our hotel room we spot a familiar face getting out of a car, it's Ky Michaelson. I go over and introduce myself and can't help but ask about progress on the CATS rockets. Charles and I were both disappointed to hear that due to legal reasons and problems with the FAA no CATS prize attempts were to be made at the event. Ky joined us in the bar and showed us a small portion of the evidently huge amount of paperwork and red tape he had been working through over the last few months to try and get his rockets in the air, it was obvious that he was also very disappointed.

Saturday 1st August.....after a well earned lay-in

Charles and I sit frantically stuffing hash browns and egg in to our mouths at about half past nine in the morning. We want to head out to the playa as soon as we can and get our spot on the flight line. Although the event hadn't officially started yet we were told that there *would* be flying today.

Gerlach was like a ghost town, we had obviously not yet got the hang of it as all the rocket people had apparently left for the desert over an hour ago. With only a vague idea of which direction they had gone we drove off out of Gerlach in the general direction of Black Rock. Now Black Rock is one of those places that words really can't do justice to. I've heard people from the east coast of the US say how amazed they are by the sheer size of the place but having never seen a field bigger than a few hundred acres in my life...to say I was impressed is a real understatement. Driving

round the perimeter road we can see a shimmering dark line out on the far side of the playa. From our high vantage point the flight line is easy to spot. We carried on driving, past the sign marking the entrance to 'Guru road' , a local landmark of great weirdness and down to the second entrance.

From above the desert looked big...but once you're actually ON the desert...it looks HUGE!!!! The distant line of cars had disappeared below the curvature of the planet (yeah...it's that big!) So we first decided to follow the tracks that were clearly visible in the soft ground assuming they had been made by the early arriving rocket folk. A few miles out the tracks diverge and we're left trying to decide which ones to follow. A Volvo drives past us at speed looking like it knows where it's going. We decide to follow it. After five minutes the Volvo begins to turn and then turns again, we begin to realise that he has no more idea of where he's going then we do. On the horizon in all directions we can see the dust trails of lost cars driving around in frantic search of the flight line.

Charles is sure we want to head left so off we go leaving the dazed Volvo behind. Because of the bizarre optical illusions every discarded beer bottle and piece of tire on the horizon could just as easily be a line of cars. Finally we see something big and black in the distance and head towards it as fast as we can. As we get closer the black object is joined by a long line of other black objects, either lots of people have got lost together or it's the BALLS 8 flight line.

We pull up on the end of the line and get out. The heat is less than I had thought it would be (it was still before ten in the morning.) Rocketeers are busy setting up sunshades and shelters and un-packing rocket equipment. We park up and walk along the growing line of cars, campers, tents and shelters admiring some of the hardware already being unpacked and prepared. We meet Bruce Kelly, president of Tripoli and say hi then head down to the far end of the flight line to meet the University guys who's huge black tent was what we saw on the horizon as we approached. Now these guys know what they are doing, the tent is enormous and is apparently made from a parachute. They have their trailer parked under the tent, it was surprising how cool it was in there.



Our makeshift sun shelter just after we arrived on the first morning of 'BALLS'. The temperature on the desert reached 125 degrees in the shade.

After a while we headed back and set up our somewhat flimsy shelter. We unpacked the rockets and laid them along the front of our pitch. For a final touch we hoisted the British flag on the pole of our shelter then headed out to fulfil our A.P. cravings.

To find out how Ben and Charles got on see the next edition of 10, 9, 8.

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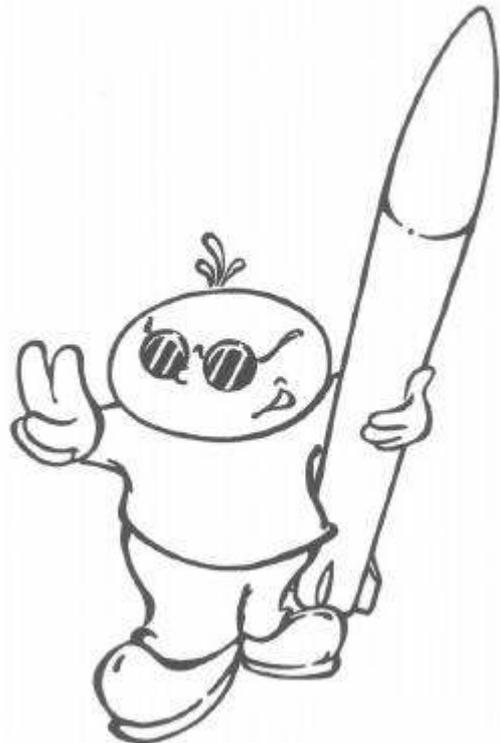
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Launch Report - North Star Rocketry Group.

By Darren Longhorn

Baildon Moor 12.30 P.M. 26/02/00. Considering the weather was the usual gusty wind, we had a pretty good launch. Attending were Brian Best, Pete & Angela Waddington, Darren, Shaun & James Longhorn.

Not in any particular order...

- Pete flew his Spudnik on an A10-3T
- I flew my Centuri saucer on a B6-0, for a low flight.
- Brian flew his MoonDog GTI, modified for an 18mm motor, on a B4-2, nice straight flight.
- James flew his scratch built 'Jammy Dodger' on it's maiden flight on a B6-4. The nose cone detached, but Brian found it later, and there was no other damage. This was James' first scratch built rocket.
- I flew my Mk5 on a cluster of 4 x C6-7, (which redeemed itself after the last attempt). Bit of a wobbly flight in the wind, and the descent was a bit fast on a streamer, but it shortened the walk. Cracked fin needs repairing, but it will probably fly again.
- James flew his Quest Tomahawk, on it's maiden flight.
- Brian and I flew our Estes Phoenix's on a D12-3s, nice flights, unfortunately mine cracked a fin on landing.
- Shaun flew the KB-1, arced into the wind, but that meant for a short walk.
- Brian flew his Mini MOORS lander twice, once on an A10-3T and once on an A3-4T, while Pete flew his Mini Marz lander, on an A10-3T.
- Brian also flew his unfinished Sat V look alike on a B4-2 for it's first flight.
- Pete flew his 40th anniversary Alpha (eventually, after several attempts) on an MRC A8-3 Tracker.
- Brian flew his twin Alpha (imagine two Alphas, with two fins each that weren't separated at birth). Would have been great but only one engine lit.
- We also had a UFO drag race, my Centauri saucer (C6-3), Brian and Pete's Quest UFO (C6-0 & B6-0 respectively). The sky was too busy to tell who won!
- Brian flew his Rogue Aerospace Interdictor on a C6-5. This was great. A really lazy spin made for a cool flight. Rather a long walk for recovery, but no damage.

Afterwards we retired to the pub for an NSRG 'committee' meeting. We don't have regular launch days, but organise them on an ad hoc basis. Now that the web site is up we will try to put dates on with as much advance notice as possible. We must stress that our launch site is for model rocket flying only.

NSRG (North Star Rocketry Group)

Contact: Darren J Longhorn: darrenlonghorn@geocities.com

We fly locally on Baildon Moor, West Yorkshire. (Model rocket flying only)

See website for flying dates.

www.NorthStarRocketry.org.uk

Pushing the Envelope

By Charles Simpson

This is a term we have all heard from time to time. It get used a lot in the business world, but what does it mean? Simply put, it means to push the upper limits of whatever endeavour you are currently engaged in. To go one better, that little bit faster or in our case that little bit higher! With this premise in mind, the H Altitude competition was commissioned. The idea is to provide a format, under which all UKRA high power flyers can compete on a level playing field. Now admittedly, this does exclude the model fliers, but this is because it is unlikely that a model flyer will have committed to the expense of buying an altimeter of some description.

The next question that most people ask is "Why H motors". Ok that's a fair question and the reasons are as follows. We could have chosen I's or even G's to go either side of the H, but it was decided that the H would be better because of the wider range of motors and the higher total impulse than a G and the lower cost than that of an I. It was also decided that the H motor available were more than sufficient to achieve a more than respectable altitude. The next decision that had to be made was that of determining height. The more traditional tracking scopes and mounted protractor methods were discarded almost straight away due to the high altitudes expected from the rockets. This leaves only one option an altimeter. Now with so many altimeters on the market nowadays, this also required definition. What criteria did the unit have to match in order to be acceptable and ensure that everyone was using the same format for measuring the height. This again came down to two options, barometric (ie using air pressure at peak to calculate altitude) or accelerometer derived (ie using the rockets velocity and time travelled to calculate altitude). It was decided to use Barometric derived altitude calculations due to the fact that an accelerometer derived altitude has to assume the rocket is travelling vertically throughout its flight, and we all know that this is usually not the case.

Now that the basics are in place, the rocketeer is free to experiment with the weight of the rocket, the configuration, fin shape, recovery system, length, materials and many other aspects of the design and construction. The usual provisos will, of course, still be relevant. RSO on the day will of course judge if the rocket is suitable for flight and will, no doubt, ask you about many of your rockets features such as recovery, weight and motor power and anything else that the RSO may wish to satisfy himself of, prior to your flight.

The rules are summarised as follows :-

- The rocket must carry a barometric altimeter
- The rocket must be built using a minimum of metallic parts.
- The rocket must utilise an "H" motor from the UKRA recommended motor list.
- The UKRA safety code must be adhered to, in full.

With that all out of the way, I can now tell you, that there is a Trophy for the competition, sponsored by Berus Aerospace and Pete's Rockets. It has 10 years worth of small plaques on it. Each years winner will have his name, altitude and launch site

placed on it and will keep the trophy for one year or until that next competition, whichever happens first. The results will also be logged onto the UKRA website for all to see!

It only now remains for me to wish all competitors, good luck and tell you that this year, the H altitude competition will take place at the UKRA 2000 event, so get building.

UKRA Council News

By M Perman

In the last Newsletter a request was run for members to volunteer for the vacant posts on the Council. I am pleased to tell you that so far two members have volunteered and have been co-opted, they are Darren Longhorn and Steve Randall. The current list of council members is therefore:-

- **Chairman** - Mark Perman
- **Vice-Chairman** – Michael Williams
- **Secretary** - Liz Perman
- **Membership Secretary/Treasurer** - Hugh Gemmell
- **Head of Safety and Technical** - Charles Simpson
- Pete Davy
- Rick Newlands
- John Bonsor
- Robert Wark
- Ben Jarvis,
- Richard Osbourne
- Bob Arnott
- Darren Longhorn
- Steve Randall

There is still a vacant post on the council. If you would like to volunteer to help with the running of UKRA and help build a safe and secure future for our hobby send your resume to Hugh Gemmell at the UKRA PO Box and the Council will be pleased to consider you for co-option.

The Council is currently meeting monthly with meetings split between Lincolnshire and Worcestershire. The last meeting was held in Lincoln and lasted for 5 hours covering such topics as:-

Treasurers Report, Membership Report, Safety and Technical Report – including update of the Safety Code, Web Site Report, BMFA Report, CAA Report, Newsletter Report, UKRA Events/Support to clubs, UKRA documentation, Links with other bodies and UKRA advertising and merchandise

The Council has been in contact with Traplet Publications of Worcestershire who publish a range of Hobby and Model Magazines. Traplet kindly provided copies of there current magazines including a copy of a book by Stuart Lodge on Model

Rocketry, which we will be offering as a prize in the next edition of 10, 9, 8. Traplet also produce hobby videos and the council is currently in discussion on the production of a UK rocketry video. Hopefully we will have more news next time.

Finally congratulations to Hugh and Kate who got married on the 26/02/2000.

British Rocketry Oral History
Programme
co-sponsored by

British Interplanetary Society

2nd Annual Conference

at

Charterhouse School

April 6/7th 2000

The conference will examine the period 1955-1965 with particular emphasis on the work of Saunders-Roe, Ansty and the Royal Aircraft Establishment.

For further details contact L.F.Wright@livjm.ac.uk or 0151-281-1134
or CN Hill, Charterhouse School, Godalming, Surrey GU 7 2DZ

Quest Payloader Modifications

By Michael Williams

It started as a kit review.....

When I originally planned this short article I was going to compare two starter kits that were easily available at the time for less than ten pounds. I also wanted to compare the products from two different manufactures. It very soon stopped being any such thing. Here goes anyway.

Most of the small kit built rockets I see at events in the UK are made by Estes and nearly all the rest coming from Quest. The first rocket I built for this review was an Estes Flash. It cost me £9.99 and went together in about an hour. It has an 18mm mount and is designed to fly on B and C engines. The fins are mounted "through the wall" and are extremely strong as a result. The rocket also has a large payload section, 11 inches long with an inch diameter. The colour scheme is black, red and sparkly silver flashy bits. The rocket comes with 3mm launch lugs. You also get a substantial motor retaining clip and the kit will stand on its fins. The only thing that looks slightly out of place is the newer style shock cord mount that sticks out of the side of the airframe, in a rather ugly and un-aerodynamic way.

My Quest choice turns out to be rather different. It was the Quest Payloader. In its "factory built" state this rocket would have been a horrible disappointment. You know faults get serious when you have to resort to a list:

- This is a fat rocket, performance on recommended C motor would be pretty poor.
- The fin mount involved a couple of plastic doughnut like rings that went round the outside of the airframe. These also held the launch lugs and were as about as aerodynamic as a CD rack.



The picture above is of the two kits discussed. The Estes Flash is on the left and the Quest Payloader on the right. If the Payloader had been built as per the instructions then their would be a pair of red plastic rings visible that hold fins/launch lugs. you would also see a black stripe between airframe and payload. The upper white stripe is insulating tape holding the nose cone on. You can just see the engine mount poking out of the bottom, no motor is fitted and the motor retainer was not used.

- The thing was designed to come down on two parachutes and in two parts. On most of the sites I use that would mean that the nose cone and payload section would be lost forever.
- The payload section was held to the airframe by a coupler only 6mm in length. This meant the rocket would wobble on the launch pad. The kit supplied “shims” to help hold the thing together. Maybe designing it right in the first place would have been better.

This kits only major advantage over the flash is that its payload section was a more useful shape, at 1.5 inch diameter. A PP3 battery can be inserted comfortably into the payload section, but without up rating the motor you would have trouble getting the thing off the ground.

The changes made to the Quest Payloader are as follows, thanks to Richard Osbourne for some of the suggestions used here:



The picture shows the through mounted fins, launch lugs and motor mount. The new blast ring can also be seen. This was located in such a way that an Estes D12 would stick out of the back of the rocket by about 2mm. This is then held to the motor mount with a wind of masking tape. The launch lugs need to be held away from the side of the body tube so that the launch lugs will miss the side of the payload section

- The black plastic coupler between airframe and payload needed to be made longer. I used a Dremmel Multi to sand down the decorative part of the coupler (it shows as the pretty black section on a factory built rocket). This produces a much

more reasonable 17mm coupler. This job took a surprisingly long time and made a terrible mess (sorry to the Perman's and their washing up!)

- I replaced the twin parachute design with a single one. In addition the payload and airframe were joined with elastic shock cord. It would be possible to attach this via a length of Kevlar string to the engine mount (see later) but I adapted it to fasten to the airframe sidewall using the Estes folded cardboard and white glue technique. Using just one of the supplied parachutes is likely to bring the kit down rather quickly but still perfectly safely.
- If the Payloader had been an Estes kit it would have been given a 24mm motor mount. Quest don't make a 24mm motor, which may explain why this model didn't get one. The Estes 24mm D-12x is easily the most popular single motor at the Thrust rocket club meetings I help organise and it seemed the most obvious upgrade to this kit. So, the motor is inserted into a piece of cardboard tubing from a bacofoil package. This is almost perfectly 24mm internal diameter. About 3mm of cardboard tube was allowed to protrude out of the back of the airframe to help attach the motor. The supplied motor retention clip might be made to work but would be extremely difficult as the gap between the outside of the motor tube and the inside of the airframe is so small. A piece of an old Aerotech E-motor was used as a blast ring. This is phenolic and more suitable than cardboard, though cardboard would be perfectly satisfactory.
- I cut slots in the side of the airframe and trimmed the fin roots so that the fins pass through the airframe and touch the motor tube. This is where problems may develop, as this is the way that the motor is aligned with the airframe.
- The gap between the motor mount tube and the airframe needs to be filled in so that the ejection gasses don't escape backwards.
- The red plastic doughnuts are now missing so that the launch lugs need to be changed. Their needs to be a 4mm clearance for the launch lugs because the payload section is wider than the airframe.

Once that lot is done you have quite a different rocket than Quest intended. Prior to flight it should be swung tested. My rocket passed without need of modification, but if nose weight were required it would be easy to fit.

I flew the rocket at the Thrust event on 21st November and it flew very well on a D12-5, altitude was hard to judge but 1,000ft feels about right.



Modified coupler.

Note: All decoration and detail have been filed off the coupler. The whole black section now passes inside the airframe.

International Rocket Week 2000

**Kelburn Country Centre
Largs Ayrshire
August the 21st - 28th**

Open Experimental Flying 1/2A to K Possibly M Class
Competition Flying
Aquajet Flying
Talks
Social Events
Camping On Site
Quality Food On Site
Family Entertainment On Site
Local Hotel & B/B Accommodation
Local Attractions Including Viking Festival

Further Information:	http://www.gbnet.net/orgs/staar http://www.scotroc.force9.co.uk/largs/ E-mail largs@ecosse.net
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**Contact: John Bonsor, 15 Smith Avenue, Longbar, Glengarnock
Ayrshire, Scotland, KA14 3BN**



Rocketry Contacts and Flying Dates

By Liz and Mark Perman

All dates are subject to confirmation with the relevant clubs, please check prior to attending. Please let us know about others and we will include them. Also if your details are listed below please let us have the Main Contact, Flying Dates and Information for inclusion in the next issue.

One of the most commonly asked questions by members and people enquiring about model rocket flying in the UK is "where is my nearest club/rocket contact". Obviously we have member's details but we do not give them out without permission. As a way of increasing contacts within the hobby UKRA is publishing a list of individual contacts. If you are prepared to let your details be published do let Hugh Gemmell know via the UKRA PO box address.

AspireSpace

<http://www.gbnet.net/orgs/aspire/>

BIS (British Interplanetary Society)

Main Contact: General Enquiries
27/29 South Lambeth Road, London, SW8 1SZ

BNSC (British National Space Centre)

<http://www.open.gov.uk/bnsc/bnschome>

Main Contact: General Enquiries
Tel: 0171 2150807

The British National Space Centre is Britain's 'space agency'. Formed in 1985, it is a partnership, advising and acting for its partners - Government departments and Research Councils - to focus Britain's civil space activities. Its mission is to help win for Britain the best possible economic, scientific and social returns from national and international activities in space. BNSC's partners provide the funding for UK civil space activities. That funding, currently around £200 million every year, is spent 50% Earth observation, 26% Space science, 12% Satellite communications, 3% Technology and transportation, with the balance to administration, education and awareness. Overall, two-thirds of UK space spending is devoted to European Space Agency (ESA) programmes, and one third to our national programmes.

BNSC has some 40 staff working in policy teams at the London headquarters near Victoria in London, and a number of researchers at partner sites around the UK. These R&D teams are based at Rutherford Appleton Laboratory (the Central Laboratory of the Research Councils) near Didcot in Oxfordshire; the Remote Sensing Applications Development Unit, in Cambridgeshire and in Southampton; and the Defence Evaluation Research Agency, at Farnborough in Hampshire and elsewhere.

BNSC works closely with Europe in space (through the European Space Agency, its programmes and its research centres) in order to optimise our share of space activity,

and cultivates links with other space-active countries, such as the USA, Japan, Russia, China, Canada and India.

British National Space Centre, Telephone: +44 (0)171 215 0806/7
151 Buckingham Palace Road, Facsimile: +44 (0) 171 215 0936
London SW1 W 9SS

British Space Modelling Alliance

Main Contact: Stuart Lodge
E-mail: loggi.interspace@lodge28.freemove.co.uk

The BSMA is the BMFA specialist body for space modelling

DCS (The Discovery Space Club)

Main Contact: Robert Law
Phone: 01505 815100.

The DCS formed in 1987 to inform public interest in astronautics and to monitor space activities makes extensive use of information and satellite technology and participates in on-line conferences with NASA during Space Shuttle launches. DCS members have visited the Kennedy Space Centre and Cape Canaveral, witnessing 'Shuttle and other rocket launches, and have regular contacts with local space support and media organisations there. Further visits are planned. Although primarily a "space watch" group the DCS does carry out occasional model rocket flying activities (sometimes in association with STAAR Research).

EARS (East Anglian Rocketry Society)

<http://www.btinternet.com/~steve/EARS>

Contact: Steve Randall, 47 Western Ave., Felixstowe, Suffolk, IP11 9SL
Tel: 01394 274579
Email: steve@btinternet.com

EARS will start flying at a site near Cambridge in the next few months. Please let us know if you are interested. The above contact information is provided until more permanent arrangements can be made.

ERA (Eastern Rocketry Association)

<http://www.jcsoftware.freemove.co.uk/era>

ERA is an association of enthusiasts aiming to promote and develop rocketry by organising workshops and displays, putting people in touch with suppliers and clubs, finding new launch sites and generally just helping people to get the most from this exciting sport.

H.A.R.T. (Hornchurch Airfield Rocket Team)

http://ourworld.compuserve.com/homepages/hart_rockets/

KRC (Kent Rocket Club)

<http://www.btinternet.com/~y2ksoftware>

LARCS (Lincolnshire Association of Rocket Clubs)

MARS (Middlesex Advanced Rocketry Society)

<http://www.mars.org.uk/>

MARS, or the 'MARS Advanced Rocketry Society' to give it its full name, is the UK's longest running and, some may say, most successful amateur and high power rocketry group. MARS was originally founded as a small group of 'model rocket' flyers in North West London launching small kit rockets from local parks. Over its nine year history MARS has grown in to a National group of rocketeers committed to pushing the limits of non-professional rocketry, developing new rocketry technologies, breaking records and above all having fun!

NSRG (North Star Rocketry Group)

www.NorthStarRocketry.org.uk

The North Star Rocketry Group is a lightly organised group of rocketeers from West Yorkshire. We fly model rockets locally and attend events throughout the UK to launch high power rockets. Our local launch site is on Baildon Moor, in West Yorkshire. Launch dates, launch reports, photos and links will appear on the web site soon.

Contact: Darren J Longhorn: darrenlonghorn@geocities.com

North West Rockets

E-mail DATSCOPE@aol.com

North West Rockets are a small informal group of rocketry nuts who do it for fun! We are not out to break any records but do like to make rockets and fly em. As yet we do not have a site but participate in events across the country from Scotland to Southern England. Future aims are to have our own site. Speciality are upscale kits, cameras in rockets, home-made electronics and the like.....ANYBODY WELCOME TO GET INVOLVED!

PRS (The Paisley Rocketeers' Society)

Main Contact: John D. Stewart

PRS Honorary Secretary, 15 Bushes Avenue, Paisley, PA2 6JR, Scotland, UK.

Tel: 0141 884 2008.

The PRS, founded in 1936, was one of several pioneering amateur groups formed around the world during the 1920's and '30's, which took the first practical steps towards reaching space by rocket. Prior to WWII the PRS conducted some 85 flights encompassing research in rocket aerodynamics, thrust improvement and recovery methods. They also achieved the world's first stabilised 3-stage rocket flight, and

pioneered camera-carrying rockets. Since 1965 the PRS has concentrated on the development of "AquaJet" rocketry, i.e. reaction propulsion by water and air pressure.

SERF's (Southern England Rocket Flyers)

<http://www.serfs.co.uk/>

SRA (Sheffield Rocketry Association)

<http://www.cruiserd.demon.co.uk>

S.T.A.A.R. Research

(Space Technology Applications, Astronomy and Rocket Research)

<http://www.gbnet.net/orgs/staar/>

Main Flying Date:

2000 Flying event: International Rocket Week Monday 21st August to Monday 28th August inclusive.

Main Contact: John Bonsor

15 Smith Avenue, Longbar, Glengarnock, Ayrshire, KA14 3BN, Scotland, UK.

Or C/o Bobby Wark of ScotRoc. E-mail: bob@scotroc.force9.co.uk

STAAR Research, formed 1989 in Ayrshire, Scotland, has three main strands to its model and high power/amateur rocketry programme: -

- Public and educational rocketry through the "Rockets To Go!" and "Rockets Masterclass" workshops.
- Scale flight research applications, particularly on the Waverider aerospaceplane concept.
- Organisation and development of the annual International Rocket Weekend [since 1992 (formerly the Scottish Rocket Weekend/1986 to 1991)], expanded to the "International Space & Rocketry Week" from 1998.

Thrust Flying Club

http://ourworld.compuserve.com/homepages/thrust_for_space

2000 Flying dates:

Confirmed dates, March 19th, April 16th, May 28th, June 2nd - 4th, Sept 17th, Oct 8th, Nov 19th.

Provisional dates, check back July 16th, Dec 3rd.

Main Contact: Mike Williams

Tel: 01283 533848

100306.20@compuserve.com

Thrust has been in operation since 1997 and has an average group size of 20 people. All level of flyers are welcome with the range being certified up to J Class.

UKRA (United Kingdom Rocketry Association)

<http://www.ukra.org.uk/index.html>

Main Flying Date:

2000 Flying event: Friday 2nd to Sunday 4th June 2000 at Garlands Shooting Ground, Tamworth (Home of Thrust Rocket Club)

Main Contacts: Hugh Gemmell (Membership Secretary) Hugh@cruiserd.demon.co.uk
Liz Perman (Secretary) Liz.mark@virgin.net

West Lancs Rocketry Society web site is at:-

<http://www.wlrs.org.uk>

We currently have 5 members of the West Lancs Rocketry society and are based in the design and technology Dept in Edge Hill College in Ormskirk.

We hold meetings roughly once a month, although it really depends on the weather. We have facilities to use CNC machinery to produce fibreglass fins, centring rings and fin alignment jigs. We can also manufacture Vinyl Decals of virtually any size, so we can offer this facility to UKRA members providing they pay for the materials. At the moment we charge a subscription fee of £5 so that we can cover the costs of producing our Quarterly newsletter, and left over cash gets put in a Kitty for our group projects etc.

Contact e-mail address is:- club@wlrs.org.uk

Rob O'Brien

UKRA Rocket Contacts

Hugh Gemmell, Sheffield, Hugh@cruiserd.demon.co.uk

Bob Arnott, Cambridgeshire, Bobar@ocston.org

Dave Thompson, Liverpool, DATSCOPE@aol.com

Darren Longhorn, Leeds, Darrenlonghorn@geocities.com

Rick Newlands, Sussex, Rnewlands@aol.com

Richard Osbourne, London, Richard@cyberthinc.demon.co.uk

Charles Simpson, Lincolnshire, Chas@helix.ukf.net

Michael Williams, Staffs, Lawn_dart@yahoo.com

Bobby Wark, Ayrshire, bob@scotroc.force9.co.uk

Mark Perman, Worcestershire, liz.mark@virgin.net