



BRITISH RADIO CAR ASSOCIATION

Bikes Section Handbook 2016



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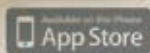
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Contents

Chairman's Introduction	4
Section Officials & Contacts	6
How to use this book	7
Construction Rules	8
Procedural Rules	11
National Series Information	13
All about the Bike class	18

Chairman's Introduction



Bikes, Electric & IC

Introduction

1/5th bikes have grown over the past few seasons, with several World Championship events, the first at Brookland ('06). Last year in Valencia and this year in Germany, so the future is looking good. Bikes vary in design but follow common construction rules to keep them in scale and a fair representative of the real thing. RTR versions of Electric and Nitro bikes are available from the likes of Thunder Tiger, specialist companies such as KP Designs, RG, Lightscale and NF have developed racing chassis with the latest technology and materials to assure a performance enhancing package. The engineering prowess of individuals is actively encouraged, and scratch built specials are frequently seen on track, including the popular Moto3 style stock bikes which utilise the smaller front wheel on the back.

Race Entry

Bikes are performing regularly at Clubs, including Adur, Aldershot, Cotswold, Craigavon, Mendip, Halifax and Southend with a 5 round National season planned for 2016. The busiest place for information and an up to date entry list would be the Moto-5 forum which can be found at www.moto-5.com. Also emailing any of the bike contacts listed under the BRCA bike section will enable them to send you any relevant details or information



regarding race entry. Please feel free to come along to any of the meetings even if you just want to ask questions or have a bike that you want us to look over. The bike racers are very friendly and always willing to help newcomers get their bikes up and running.

Race Procedure

The format for our National series consists of 3 or 4 qualifying rounds of at least 5 minutes (time depending on entry numbers and race director) based on your 3 fastest consecutive laps. This gives you the opportunity to pull into the pits make adjustments and then go out again for another try. Plus it's not so critical if you crash and have to be marshalled, your heat isn't lost completely. There are then 2 finals which are of 10 minute duration with each final counting individually towards your points tally in the championship.

Technical Rules

Bikes are basically split into three classes - Superbike, Nitro and Stock with a fourth class of sidecars which are based on the real three wheel designs, the rules for these being a little open to encourage development.

Alan Leighton – Bike Section Chairman

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How to use this section handbook

This booklet is aimed at competitors or officials for the Bike class, enabling them to have the information required for the class at all times, however it should prove useful to all club racers too as we hope it will give the reader more information about our national series.

The information contained herein should be read in conjunction with the Association Handbook as the General Rules contained in the handbook apply to us all, at all events, and in any circumstances take precedent over sectional rules. It is every member's responsibility to ensure they have read and understand – ask an executive official as appropriate for clarification if you don't – the general rules.

The application of the rules works thus:-

The Association General Rules apply at all events we go to, including most club racing as we are all members of the association at all times, Sectional Rules (as in this book) apply at Nationals plus other events, e.g. regionals, as sanctioned by the section committee. Sectional rules do not apply at clubs, unless the clubs wish them too and it is entirely the clubs choice either way.

Changing a Rule

Every rule in this booklet and the Association Handbook was proposed and voted in by one of your fellow racers – none of the committees can simply 'make up' a rule. If you don't like a rule you can easily try and have it changed (though the first thought should be to find out the rationale of why one of your fellow racers proposed it in the first place perhaps?) If you're happy a rule needs changing get somebody else to agree with you – a seconder – and then write/email to one of the following people:-

Section Rule to be changed – Section Secretary – who will liaise with you to ensure it's then voted on at their section conference.

Association General Rule including the Constitution – Association Secretary - who will liaise with you to ensure it's voted upon at the Association annual general meeting.

You should endeavour to be at any meeting where a rule change, you have proposed, is taking place as it will be discussed, possibly amended, plus you'll almost certainly be asked to elaborate on it.

Summary

'The Rules' should be the easy bit of our sport, but they're not as we're all passionate about our sport and should want to have an input into how it's run, make sure you have your say, the Association works because people get involved and make a difference.

If you don't like how something is being done, you should offer to do it yourself, every Association official is a volunteer and they are doing a role because it needs doing. However it is as much your responsibility to do that task as it is theirs – just that they volunteered to do it before you had the opportunity to offer to do it better.

Bike Construction Rules – 2016

1. Racing classes

1.1.a 1/5th Stock Class (Moto2 / Moto3)

Power source: Mardave G2 sealed 'silver-can' brushed motor or 17.5T brushless powered by blinky/non turbo speed controllers only.

Hand-out G2 motors will no longer be supplied, motors must be clearly marked with the Mardave branding and codes and must not be modified in any way.

Motors or brushless combinations found to be falling outside of these rules must be withdrawn from the race meeting. Rider penalties range from loss of qualifying results with that motor for

a first offence through to disqualification from the meeting for a second offence No front brake or any mechanical brake on either wheel allowed.

Any battery type allowed up to the max 7.5V nominal voltage including lithium polymer.
No Weight Restrictions

1.1.b 1/5th Anderson M5 Race RTR Kit.

Must be run as "Box Stock" no modifications allowed.

Receiver can be swapped out to make use of other radio equipment To be run as a subclass of the G2 Stock class

1.2 1/5th Superbike Class (MotoGP Electric)

Any type and size of motor allowed, including brushless.

Front brake allowed (see point 2.4 below for specification).

Any battery type allowed up to the max 7.5V nominal voltage including lithium polymer.
No Weight Restrictions

1.3 1/5th Nitro Class (MotoGP Nitro)

To have no restriction to fuel tank or engine size or type. No Weight Restrictions

1.4 Sidecar Class

Power source: Stock class motors as described in section 1.1.a may be used. Nitro power source is open.

Overall size to be 435mm in length by 220mm in width maximum. Sidecar chassis must fit within the shell.

No Weight Restrictions

Single rear wheel drive, Single front wheel steering. The use of a steering gyro is allowed.

Any battery type allowed up to the max 7.4V nominal voltage including lithium polymer.

2 Construction rules

2.1. Appearance

The essence of the sport is radio control motorcycle racing and as such all Bikes and Sidecars entered should be realistic in appearance, neatly finished, and complete with bodywork and rider all of which should be painted.

All fairings, bodywork, seat units and rider figures should be to scale and appropriate in both style and colour. Scrutineering has the final decision as to what constitutes a reasonable representation and the penalty for failing to comply.

2.2.A 1/5th On Road Dimensions

Wheelbase -	Max: 320 mm	Min: 280 mm
Rear Wheel Diameter -	Max: 95 mm	Min: 80 mm
Front Wheel Diameter -	Max: 95 mm	Min: 80 mm
Any Tyre width -	Max: 35mm	
Height of bike inc. rider -	Max: 300mm	Min: 240 mm
Weight -	Unlimited	

2.2.B Sidecar Dimensions

Overall dimensions	Length	Max 435mm	
	Width	Max 220mm	
	Height	Max 120mm including rider	
Wheelbase -		Wheels must fit within the shell	
Rear Wheel Diameter -	Max	63 mm	Min 38 mm
Front Wheel Diameter -	Max	63 mm	Min 38 mm
Sidecar Wheel Diameter -	Max	63 mm	Min 38 mm
Any Tyre width -	Max	45mm	
Weight -		Unlimited	

2.2.C Sidecar Construction Limits

Electronic gyros are allowed to aid stability.

The track of the centre of the driving tyre can have a maximum offset of 25mm from the track of the centre of the front tyre.

Sidecar wheel can be positioned freely, but sidecar wheel centre must be in front of the driven wheel centre. Sidecar wheel steering by radio control is not permitted, but changes to steer and geometry due to suspension movement are allowed. At all times must conform to overall dimensions above.

2.3 Tyres

Any solo bike tyre specifically designed for bike use.

Sidecar Tyres are open within dimensional limits.

Tyres must be black except for sidewall detail.

Non slimey and odourless tyre additive to be allowed, but only at circuits that allow it.

Tyre caps are allowed in all classes.

2.4 Brakes

Brakes either disc or drum are allowed in the 1/5th Superbike and 1/5th Nitro. Only braking via the speed control allowed in every other class.

2.5 Transmission

In keeping with full size motorcycle design.

2.6 Body shells and Rider Figures

The shape must be realistic; scale representations of actual racing motorcycles and

sidecars although a generic design is acceptable, and must include a rider figure. Paint scheme is left open to each individual and models can be finished in the rider's own design.

2.7 Aerodynamics

Any form of aerodynamic aid not in keeping with the full size sport is not allowed.

Fairing, body work and rider cannot be trimmed in a way that detracts from the bikes scale appearance

Rider figures hands and feet may be trimmed to allow clearance to steering, primary drive and lean angle but arms and legs must retain realistic representation of a full body figure in a racing position.

2.8 Exhaust / induction noise

The complete exhaust system should be contained within the confines of the body work and fitted in such a way as to minimise the risk of injury to marshals.

If any part of the exhaust / silencer system fails or becomes detached during a race the rider has to return to the pits immediately to have the problem rectified. Further laps with a noisy engine will result in a penalty decided by the Race Director, whose decision is final.

2.9 Battery / charger

All Batteries used as the main power source to power a bike/sidecar during a race must be charged with an appropriate charger and charging profile.

All Batteries used as the main power source to power a bike/sidecar during a race must be charged inside a suitable fireproof container as to minimise the risk of damage.

Bike Procedural Rules – 2016

3. Racing rules

Any point brought up at a meeting not covered by these rules to be ratified by 3 committee members must be confirmed by a vote of all entrants to the next National meeting.

3.1 General Rules

Entrants can choose just any number of classes to enter at each meeting, but must make sure proxy marshals are in place if needed

All bikes to have correct numbers applied, any incorrectly numbered will be placed at back of grid.

Nitro qualifying and finals to start first, followed by electric classes at Race Directors discretion.

Some clubs have local noise rules which may not allow for above.

All Qualifying heats are to be of at least 8 minutes long, but may be increased at the discretion of the Race Director if the schedule allows

Qualifying is to be a rolling start up to 2 minutes before the start of the heat.

All Finals will be of 8 minutes duration.

Start flag to be used for Nitro Finals in Le Mans Format on main straight if possible or suitable part of the track.

Electric Finals are to be a line start with a designated marshal for each heat, to be identified by the Race Director.

Starts are to be done as quickly and smoothly as possible, with a 30 second warning before the start by which time all bikes must be present for the starter to assemble the grid. Missing numbers or late arrival at the grid will result in a start from the back of the grid.

All finals will have a maximum of 8 Bikes / Sidecars per "A final", additional competitors will fill B, C, D Finals as needed up to a maximum of 8 competitors per race.

All electric classes will be subject to a random voltage check on the way to the grid, any 2S LiPo found to be over 8.44V will be deemed to have been charged incorrectly, and for safety reasons removed from the grid. The race or heat will not be held up for a battery change.

3.2 Points system

Points only to be scored from the finals, max 100 points for each separate race, e.g. then 98, 97, 96 etc.

At least one lap must be counted in a race to be eligible to score points.

Rookie Championship awards a trophy to the highest overall points scoring person not having done a BRCA Bike National before the start of the new season.

In the event of a championship draw a count back on meetings where points counted, e.g. your 8 finals (4 rounds) would be used.

3.3 Racing Format

For the first round of the new season, qualifying heats will be seeded from previous championship final standings, thereafter after the heats will be arranged in current Championship Order.

3.4 Tyre warmers

Tyre warmers will be allowed in all classes.

3.5 National meetings

3.5.1 General Rules

The National Championship will be contested over 6 rounds, with two final races per meeting scoring separately, leading to a maximum of 12 individual race results for the season. The best 8 results will count, meaning that riders who can only attend 4 of the 6 meetings still have the opportunity to compete.

All national meetings consist of 3 qualifying rounds and 2 leg finals for all competitors.

3.5.2

All Circuits hosting a national meeting must accommodate the following; Practice available on the Saturday.

Nitro heats.

Meetings to be run automatically and only stopped / interrupted by bad weather or emergency.

A designated lunch break where possible, entry and schedule allowing.

Mar shall technique, duties and etiquette to be specified at the drivers briefing, including:-

Marshals must wear high visibility jackets where supplied.

Marshals must recover and launch the machines as instructed at Drivers Briefing.

Marshals must be in place by the announcement of 30 seconds prior to race start, and remain in opposition until Race Control indicates that the race is over and all vehicles have finished.

Penalties will be made for late, absent marshal or going missing before the 'Race Over' signal.

Penalties include loss of FTD, followed by a 5-place grid penalty for persistent offenders. Exclusion from meeting remains the final sanction. This applies to stand in marshals also, but the penalties will apply to the pilot being accommodated not the substitute.

Penalties for poor conduct of any driver or his associated party at any National Meeting will result in loss of their FTD for the first offence, and dismissal from the event for a second offence.

Each venue will be required to supply a scrutineering area for machines and radios, which shall be covered where possible.

4. Radio equipment

4.1 General Regulations

40 MHz or 27 MHz radio equipment must conform to the current BRCA and UK regulations.

Riders are advised to have with them at least three changes of frequency crystals.

Foreign entrants may be able to use other frequencies, but need to be check with the race director.

2.4 GHz radio systems are allowed but must conform to the current BRCA and UK regulations

National Series Information 2016

This section contains details about the tracks that we are intending to run at for the 2016 season. It should prove useful for finding them and contains some information on their relevant facilities etc.

Cotswold Circuit

Web address: <http://cotswoldmcc.co.uk/>

Location: Kemble Airfield, near Cirencester GL7 6BA

Facilities include: Covered pits with electric, fully covered rostrum, catering and catering on race day.



Above: Cotswold track

Mendip Circuit

Web address: <http://www.mendiprcraceway.co.uk/>

Location: Mendip RC Raceway, Accommodation Road, Bleadon, Weston-super-Mare, North Somerset BS24 0AP

Facilities include: Covered pits, fully covered rostrum, camping and catering on race day.



Above: Mendip track

Adur Circuit

Web address: <http://www.adurrc.org/>

Location: The Swiss Cottage, Old Shoreham Road, Shoreham-by-Sea, BN43 5TD

Facilities include: Camping and catering on race day.



Above: Adur track

Aldershot Circuit

Web address: <http://aldershotmodelcarclub.net/>

Location: The Kiln, St. Georges Road, Farnham, Surrey. GU9 9LY

Facilities include: Fully covered rostrum and catering on both practice and race days.



Above: Aldershot track

Halifax Circuit

Web address: <http://halifaxtrack.co.uk/>

Location: Stainland Road, Halifax, HX4 8LS

Facilities include: Fully covered pits and rostrum and catering on both practice and race days.



Above: Halifax circuit

All about the Bike class

This article was kindly written for us by Joe Keaveney, Cotswold Model Car Club PRO, and is a comprehensive guide to getting started in radio control bikes. You're probably dazzled by the somewhat dizzying amount and variety of kits and equipment that seems to be essential to compete. Well - here's the thing - there's less kit needed than you think; it's more affordable now than it's ever been, and it's easier to use too!

Read on through this guide to acquaint yourself with the equipment you'll need to go racing. Then go to a club meeting at a club near you that races Bikes and talk to the racers who can show you their bikes and equipment and give you great advice on getting ready to go racing!

Radio Gear

Everyone, whether they're racing Electric or Nitro bikes, needs a transmitter and receiver, that's a given. Some transmitters are very basic; others have a vast array of options. Virtually all operate on 2.4Ghz. What's generally agreed amongst racers is that there are some features that are bordering on essential. They are:

- End Point Adjustment (limiting how much steering lock the bike has)
- Model Memory (So you can save your settings when you own more than one bike)
- Exponential settings (this can make the steering or throttle more or less sensitive around the centre point of the control, very good for making the bike easier to handle)
- Third-channel mixing. This is essential if you're racing with a bike that uses front wheel braking.

You have a choice of wheel or stick controllers. Prices for wheels start from ~£30 for the FlySky GT3B to £300+ for top of the range Futaba/KO Propo sets. Sticks start from ~£65 for the Core RCCODE to £450 for the Sanwa Exzes Z.

Transponder

Another item of equipment that you need irrespective of what bike or class you run is a transponder.

Transponders send out a radio signal that's unique to your bike - associated with every transponder is a number (normally written on the transponder itself or printed on the documentation that comes with the transponder). The RC timing software picks up this transmission from the transponder every time the bike passes the timing 'loop', and helps the software to accurately count your laps. These transponders cost from around £55 from Team MRT for the MRT PTX and from £82 from BBK Software for the MyLaps 'Harry'.

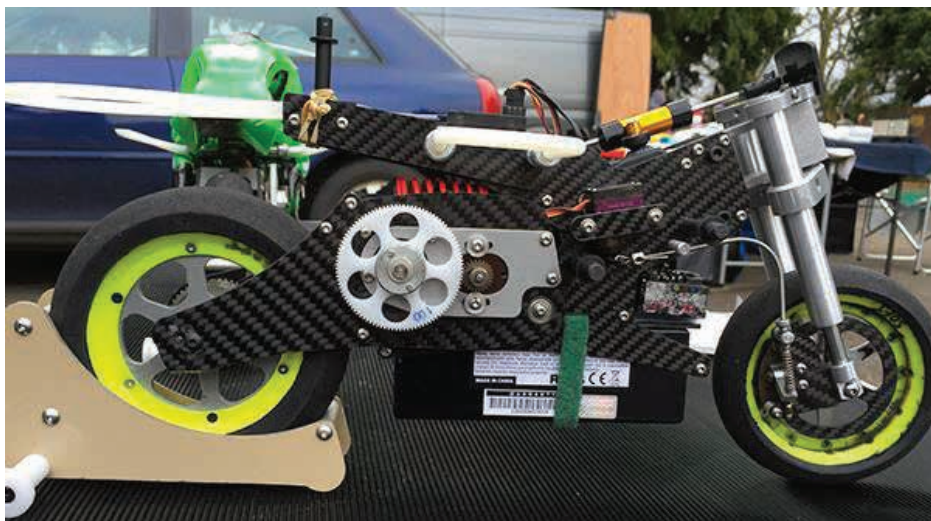
Bike Types

R/C Bikes provide something a little different from the usual car racing. They look fantastic on the track, with extreme lean angles, power slides and wheelies. Weighing in around 2Kg and reaching speeds in excess of 70kph bikes offer an amazing spectacle in any weather. Wet or dry, you will see bikes battling for every inch of tarmac.

Piloting a 1/5th bike is an acquired skill, as is setting one up to be on the pace of the leaders, but that is the main attraction. Many RC Bikers are real bikers, some are even ex-racers still looking for the ultimate thrill but with that extra safety factor!!

Electric bikes use much the same equipment as the Electric cars, but there are less rules - essentially the MotoGP-e class has no rules other than that the bike must use a 7.4V battery pack, whilst the Moto2/3 class stipulates the use of a 17.5T brushless motor (in 'blinky' mode) or Mardave G2 brushed motor. The difference between Moto2 and Moto3 is the rear wheel - Moto3 uses the same size wheel front and rear, whilst Moto2 uses a larger, MotoGP-e sized wheel. Nitro (MotoGP-n) bikes can use any engine size(!), whilst Sidecars are electric, and again utilise the Mardave G2 brushed motor.

For up-to-date and detailed information, the best option is to have a chat with our bike racers at your club who will give you all the info you need to get started in bikes. The following pages detail the equipment you'll need that are specific to RC Bikes. Read on! The most obvious purchase you'll need to make is the bike itself! They come in two flavours - battery-powered (Electric) and engine-powered (Nitro/ I.C.) Let's look at what's available.



Electric

Electric on-road bikes are today mostly available as kits from a variety of specialist manufacturers, and use the same electrics, cells and control gear as 1/10th Touring Cars. It may still be possible to find either of the Ready-to-Run bikes done by Thunder Tiger (SB5) or Anderson (M5-Race), however the SB5 has been discontinued and the M5-Race is no longer widely available in the UK. Spares should still be available online for both, but for the Thunder Tiger may need some looking up to find.

The SB5 RTR was relatively inexpensive and various Thunder Tiger and 3rd-party upgrades were available to take it to a very high spec race bike. The Anderson M5-Race has a lightweight gyro in the back wheel for added stability and is aimed at the beginner and casual user.

It also has a series of upgrades leading to a non-gyro back wheel to enable it to be used for racing, but to get to that point you are probably better off getting a better race-ready chassis in the first place.

For a newcomer starting out, a second-hand bike may be the way to go - there are usually one or two available within the UK racing community, so it is worth asking the question on Moto-5 Forum or Moto-5 Facebook.

In the UK, the two most accessible kits are the M3R Moto-3 bikes, and the KPDesigns range of Moto-GP style bikes, both of which are made in the UK.

The M3R is based on the 250cc Moto-3 Grands Prix class bikes, has small wheels front and rear and is designed for inexpensive stock-class racing using 17.5 'blinky' motor/speedo combos and no front brake. It is currently only available as an upgrade set, to which a number of parts from other kits need to be sourced, but will soon be available from Formby Models as a retail kit, priced at £249 inc UK VAT. Being short and light, it is less well suited to lots of power, where a conventional large-rear-wheel bike's extra stability and wider back tyre helps enormously.

The KP range uses a full-sized rear wheel and is capable of handling a lot more power, and is a better choice for an open-class Moto-GP/Superbike when used with a front disc brake as well. It is also legal for International competition should you wish to race overseas. List price for the KP15 is £450 inc UK VAT for the well-specified rolling chassis kit including forks and Roadie wheels but without body shell.

For steering, a basic £10 standard servo will do fine to start with, particularly on a stock bike, but for reliability and improved steering response at speed (when the gyro effect of the front wheel increases), most racers opt for a higher-powered metal-g geared servo.

You then get into the more specialist kits from Europe, with prices going up to over £1000 for high-end international-competition spec and world-championship winning machinery should you feel the need and have deep enough pockets!

Links to Electric Bike Manufacturers

KPDesigns - <http://www.kp-designs.co.uk>

RGEvolution - <http://www.rgevolution.com>

Nuova Faor - <http://www.nuovafaor.it>

Jabber - <http://www.clark-s.de/>

Eini Bike - <http://www.einitech.de>

Moto-3 M3R - <http://www.moto-3.com>

Anderson M5 MotoRace (Imported by Schumacher) - <http://www.andersonmodel.com>

ARRacing 1/4 -scale - <http://www.armodelling.com>

Batteries

If you're buying an Electric bike then you'll need some batteries. Recent advances in Lithium Polymer (LiPo) battery technology mean that we now have batteries with very high capacities and current output, which are robust enough to be used several times a day without loss of performance.



We recommend that you buy at least 2 packs of 5000mAh capacity and above. This allows you time to charge one pack while using the other pack.

Packs start from just over £20 for Turnigy Nano-tech cells (from Hobbyking in the UK). From a safety point of view, the use of 'hard-cased' LiPo batteries is recommended (although not mandated). Staying with the safety theme, at BRCA Bike events, LiPo charging 'sacks' must be used.

Chargers for these packs start from just over £25 for the IMAX B6 pictured below (again from Hobbyking in the UK)

Motors and Speed Controllers

Motor maintenance has become much simpler in the last few years with the introduction to the sport of brushless direct current (DC) motors. The brushless nature of the motor has done away with many of the essential motor maintenance tasks. What's left is to give your motor a regular clean and to oil the motor bearings. In Bike racing, your choice of motor is directly related to what class you wish to run in - for beginners we recommend the Stock (Moto2/Moto3) class, which uses a 17.5T brushless motor with the ESC in 'blinky' mode, although a Mardave G2 brushed motor can still be used. In the Superbike class, you are free to use any type and size of motor you like.

Motors and motor performance are constantly evolving so we recommend that you ask a bike racer for up-to-date motor advice. Prices range from £25 to £90 (expect to pay about £60-£80 for a very good motor) Speed controllers (the motor controller) are more affordable now than they have ever been. Hobbyking in the UK sell the X-Car 120A ESC for about £25 and it is a superb controller. The SpeedPassion Reventon S Combo includes both controller and motor (17.5T) for about £65 from MB Models. Setting up speed controllers is very easy thanks to technology such as program boxes whilst some ESCs allow programming direct from a smart phone or tablet.

Tyres

Until a few years ago the only tyre you really needed was the PMT 200 and these would work in both the dry and the wet. They were available as both a slick and a threaded tyre but people soon realised that the slick was every bit as good as the threaded tyre. The

reason being that the contact patch is so small on a bike tyre that there is little or no risk on aquaplaning. So the modern tyres tend to be available only as slicks.

The tyres could be 'tuned' via the foam inserts. A hard insert being preferred in the dry whilst a softer insert let the tyre move around a little more and was preferred in the wet. Over the years the harder inserts gained favour and now all the modern tyres are designed to work on a wheel that includes a solid insert and there is no need for a separate foam insert.

If you buy a bike with some PMT 200 tyres fitted then don't feel you need to replace them straight away. They should still work in most conditions and are a perfect tyre for a beginner. There are three main tyre manufacturers and each produces tyres that compete at the very highest level and the World Championships finals will normally feature all three makes.

PMT - PMT still make tyres and indeed the venerable 200s are still available. For 2014 they released new tyres and the range now runs from R (for the rain), SS (super soft), S (soft), M (medium) and H (hard). The tyres aren't generally available in the UK at the moment but the Italian Nuova Faor team use them and compete at the highest level.

Roadies - Made and distributed by Clark's RC from Germany. For the last few seasons these tyres have been the pick of the bunch and are available in the UK from KP Designs. The range is relatively simple running from Soft, Medium and through to Pro (hard). In the UK you only seem to need the Soft (for cooler conditions) and the Medium (for when it warms up, say track temperatures of 20 degrees plus). The Medium is used in the wet (seems to defy conventional logic but they definitely work)!

GRP - GRP released not one but two generations of tyres for 2014 and now seem to have closed the gap and be competing on a level playing field with the Roadies in the UK. The range includes the R1 for the wet and the dry tyres range from S1 (soft), S3 (medium) and S5 (hard). In the UK the R1 and the S1 seem suitable for the wet and the dry respectively and the S5 is only ever run on those rare days when we got a full sun. GRP recently adopted a direct sales approach (via their web-site) and so there is no official UK agent. Shipping is fast and normally an order arrives within 3 days.

Prices

Pre-glued tyres range from around £35 to £70 a pair and tyres on their own range from £10 to £20 a pair. Wear rates on the latest tyres are excellent and expect them to last several meetings, with many people only using one or two pairs for a season's racing.

Gluing

One of the reasons for the popularity of the Roadies and the GRPs is that they can be purchased pre-glued thereby saving you a job. Once the tyres need replacing then both the Roadies and GRPs can be placed in a tub of acetone to break down the superglue and release the tyre. New tyres can then be bought on their own and stuck on the recycled wheels.

The trick to gluing tyres is patience! Seat the tyre carefully and then use a thin superglue to glue one side down by gently lift a section of the tyre at time and running some glue underneath. Once you've done one whole side, then flip the tyre over and repeat.

Tyre Tuning

Being quite large and heavy the bike tyres are not always perfectly balanced. You can use a prop balancer to address this and then balance them using some Blu-Tack or some lead tape that is used on squash rackets. Once the tyre is mounted on the prop balancer you simply let it rotate on its own and it will settle with the heaviest part at the bottom. If it repeatedly stops at the same point (mark it with some chalk or the like) then you need to add some weight to the inside of the rim at the top. Repeat until the tyre will gently spin and then not repeatedly settle in the same position.

The other tyre tuning aid is wheel weights. Both Roadies and GRP make some steel weights that you can screw to the wheels. The more weight you add the more stable and docile the bike becomes, the downside being you lose some nimbleness and ability to change direction quickly. I find that adding weight on the rear wheel helps in the low grip conditions and the wet and I try to avoid ever adding any weight to the front.



Servos

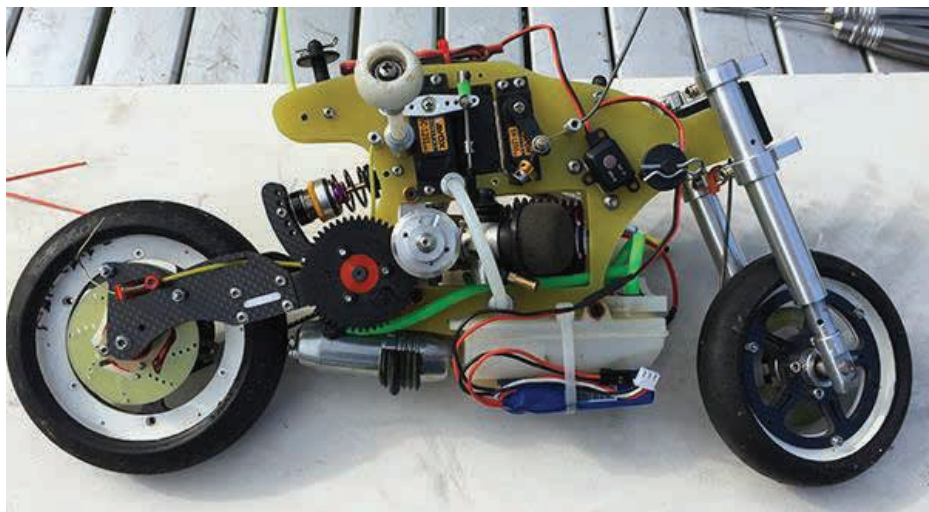
Pretty much any commercially available servo will do for steering a bike, they don't strictly require anything special. If you were just starting out and wanted to run on a budget, cheap servos would do. But as with all forms of racing, the better quality ones you purchase, the longer they usually last.

As with most car kits you only require one servo to handle the steering, as the electronic speedo does the throttle. Where bikes differ slightly is if you wish to run in Superbike the rules allow you to use a front brake, so another servo is required. This is usually a mini/micro size one such as the Hitec HS-65MG, it's small size fitting in the chassis without protruding into the shell. Savox and Futaba's new trend for low profile servos have gained popularity with some bike racers as they also fit nice and snug within the bike. The Savox SC-1251MG is quite popular due to its reasonable price, plus good speed and torque.

Bodyshells

Unfortunately this is one area that there isn't a huge amount of choice or availability. One of the most popular ones is the Thunder Tiger SB5 shell that unfortunately is getting hard to get now as the bike kits that support them seem to be in decline, causing a shortage in the UK. If you try hard you can still find some. It requires a bit of tweaking to get it to fit other bikes as opposed to it's own kit, with people often making their own wrap around the lower shell from a sheet of easily obtainable lexan. The other shell that has found favour and is available is the Italian RG shell available from Formby Models in the UK. These are light, durable and fit pretty much all of the bikes we race. Also available at BRCA Bike Nationals is a homemade shell from Graham Clarke - catch Graham Clarke trackside to get more details. There are another few available which unfortunately aren't imported into the UK, but can be obtained from their respective web sites, and these are the Nuova Faor, STO and Jabber shells.

Nitro Bikes



Nitro bikes differ substantially from their electric counterparts with the obvious difference being the requirement of an engine. Added to this is the need to house both a throttle servo, and fuel tank. Currently only 2 large manufacturers make race ready nitro bikes with readily available spares.

1) Nuova Faor with 2 models-

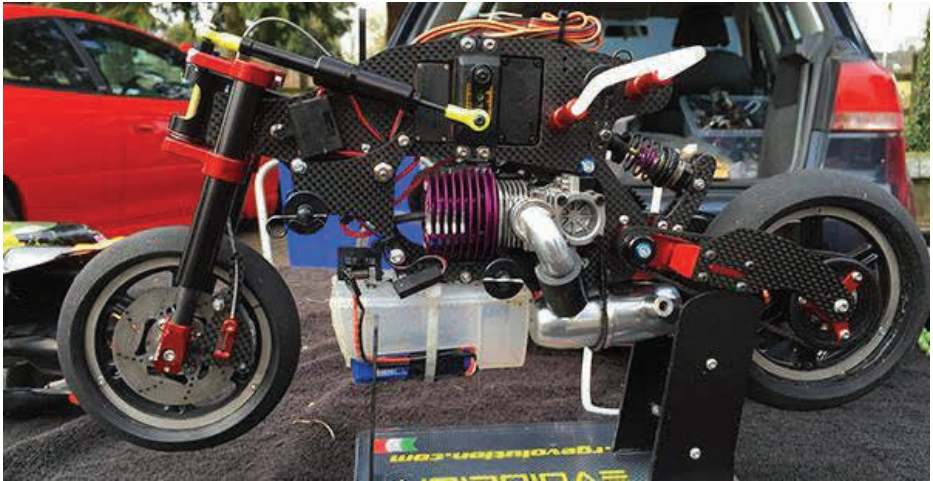
SF 509 (around £360 with engine) This is a good entry level race bike.

SF 701 (around £600 with engine) A serious race bike, easily capable of winning the World Championship (2nd place this year)

2) RG with the EVO4. (around £920)

The 2014 World championship winning bike. Arguably the best nitro bike out there right now.

How about making your own? Of course you could always design and make your own nitro bike, not easy, but ultimately satisfying. In the UK there are probably more prototype homemade nitro bikes racing than either of the above kits.



Engines

Nuova Faor and RG both use Novarossi .12, side and rear exhausts, depending on the bike. Also Nuova Faor still supply the fast Picco .12 side exhaust engine. The rules have no restriction to engine size or type, but most bikes have up to 3cc size in 2 stroke, 5cc in 4 stroke. A popular choice for homemade bikes is the unburstable and torquey OS18.

Servos

Servo size and profile is dependent on the model. Some require a separate servo for front brake only, so check with the kit. If using a 2 cell LiPo battery to power the servos, you will need a voltage reducer (BEC) for standard 6v servos, or alternatively fit high voltage servos. A 900mAh 2 cell LiPo should last a meeting without needing re-charging, but always play it safe - top up the charge before the finals.

Starting

All Nitro bikes need a separate hand held starter (rotostart) to engage either on the crankshaft end or into the one way bearing on SE pull start motors. Some homemade bikes use a battery drill or aircraft 'sullivan' style starter.

Fuel

16% nitro fuel is recommended for the .12 engines, this should get around 10 -12 minutes out of a full tank. A gallon of fuel will easily last the season.

Off Road

Below is a brief guide to R/C Motocross bikes currently available:

Anderson M5 - (1/5 scale). This costs about £160 as a 'RTR' (though minus batteries and charger). It accepts 1/10 car servos, ESCs, and 540 motors with ease. The bike nearly all of us run in the UK as it's cheap, robust and can take a bit of abuse. Upgrades are available from Anderson dealers.

The plastics are weak and it won't win as many battles against the larger 1/4 scale bikes but can still be hustled around almost any track by almost anyone regardless of previous biking experience.

Himoto 450 - (1/4). This cost about £180. It appears to be a rescaled Anderson M5, but without any factory upgrades available. There seems little information about these.

Sky SR4 - (1/4) Around £230. Quality is reported to be poor so will need a little TLC from new but it possesses a very useful electric gyro which keeps the bike more stable over bumps more of the time as against the mechanical gyros of the previous two bikes. There is some information around but a bike that's thin on the ground in the UK.

ARX 540 - (1/4) From £350 upwards depending on spec. This Italian bike has been around in various guises for years and years. Well supported by the factory, and available with mechanical or electric gyro, electric or nitro (and it is a glorious beast!) but definitely more the top end of the market.

Gyro options

Just a quick point. NO RC bike requires a gyro. Off road bikes just need the help to get over bumps as there isn't a large weight on top skilfully dancing it's way over the bike to keep it in trim. Some bikes have a mechanical gyro (M-gyro) in their rear wheel. These are powered by the motor through the chain to make them spool up to top speed, so do have the offset of numbing the acceleration. This is not always a bad thing. (If you've ever raced off road you will know what I mean). They don't hold RPMs so require 'topping up' with more bursts of full throttle.

Occasionally this can lead to difficulties when the gyro speed lowers to the point that you lose the stable gyro effect just as you hit that awkward bump on the last section of twisty and then crash because of it. Curable through taking a different line, using the least grippy tyre you can get away with to create slip under load and thus 'light up the rear tyre', or... Go electric gyro (E-gyro) These have a brushless motor contained within the rear wheel so do not create drag on the drive motor and can be set (in some cases) to a certain RPM. Full stability is assured, but it's a two way street. Sometimes you wish you weren't fighting the gyro effect when trying to turn in, but you are glad of it's usefulness when wobbling slowly around as you can then concentrate on the next section, rather than trying to keep the M-gyros' speed up.

Off-Road Tracks

The following are links to tracks with biker(s) actively running.

Sweetnap Raceway - <http://sweetnap-raceway.co.uk>

Nook Raceway - <http://www.nookraceway.com>

East Coast Nitro - <http://eastcoastnitro.co.uk/>

or their Facebook group can be found here -

<https://www.facebook.com/groups/376175025780259/>

Any Large Scale Off-Road (LSOR) track will be ok for the bikes, but you could try almost any of the 1/8 RallyX tracks too.

Bike Control

This guide assumes that your RC bike does not have gyroscope built into the back wheel for additional stability, although the same basic principles apply.

BEFORE THE FIRST RUN:

To help avoid inconsistent or strange handling:

- Check the wheels are free-running, there's no significant play in the wheel bearings, headstock or swingarm bearings and that the steering moves freely from lock-to-lock without binding.
- Check both wheels are secure and that the suspension operates freely without binding, especially on the front.
- Check that the steering servo is set to counter steer, i.e. when you turn the transmitter control left, the wheel turns right.
- Check the side 'scratch bars' are fitted and allow a lean angle of around 30 degrees from horizontal to start with.

FIRST RIDE & PRACTICE:

For first timers, a large, open and smoothly surfaced car park is ideal to get the basics sorted. Launch the bike with a gentle forwards push, allowing plenty of room around you. Gently feed in the power - once above about 5mph, the bike should stand up without steering input. It will be more stable at higher speeds, more wobbly at low speeds.

When cornering, turn the bike into the corner using the steering, then back off the amount of lock and control the lean angle and corner radius on the throttle. Back off and the line will tighten, speed up and you'll run wide. Once cornering, the steering has limited effect, usually only requiring a modest input to maintain the line.

A bike is less responsive than a car to steering input at speed, meaning you have to plan ahead and initiate turns earlier than you would expect to with a car. It also responds much better to smooth riding and flowing racing lines: get too aggressive and the bike becomes unbalanced and more challenging to control.

THINGS TO TRY OUT:

Lean over further to corner faster but be more likely to spin out and crash; lean over less for safer handling but slower cornering. Stiffen the steering springs or increase the servo throw for more responsive steering at speed, soften them or decrease throw for less twitchy handling at lower speed

FIRST RACE:

The quickest way to learn about piloting on a track is to join a club meeting at Aldershot, Cotswold or Southend when the bikes are running. Not only will you have a ready pair of hands to assist with launching and marshalling, but there will be plenty of friendly advice

and support to help you get the setup optimised, the right lines, braking points, etc. Don't be too concerned if you struggle to get more than one or two laps in without crashing to start with: we all started like that, we make plenty of allowances for new riders and it soon starts to fall into place! After that it's a matter of practice and track time - but once bitten RC Bikes are a hard bug to shake off!

Bike Tracks

Since the unfortunate demise of the Skipton track in Yorkshire, on-road RC bike racing is concentrated on four main clubs, Aldershot, Cotswold, Southend and Craigavon, all of which run both cars and bikes.

Aldershot: <http://www.aldershotmodelcarclub.net>

Location - North-East Hampshire, easy access from the M3, A3 and A31.

Regular Club Racing - Yes, bikes and cars

Practice - Yes, Members Only

Suitable for - Stock, Moto-GP/Superbike, Nitro

Notes - Bike races are typically arranged on www.moto-5.com about once a month to ensure good turnout

Cotswold: <http://www.cotswoldmcc.co.uk>

Location - Cotswold Airport, Cirencester, Gloucestershire, with easy access from the M4 and M5

Regular Club Racing - Yes for cars, bikes when there's 4 or more to run.

Practice - Yes, Members Only

Suitable for - Stock, Moto-GP/Superbike, Nitro

Notes - Regular practice and less frequent club racing is typically arranged on www.moto-5.com to ensure sufficient numbers

Southend:

Location - Essex, with easy access from the M25

Regular Club Racing - Yes, bikes and cars

Practice - Yes

Suitable for - Stock, low-power Moto-GP/Superbike

Notes - check club website for details. Many riders also race 1/10th Mini's as a second/backup class

Craigavon: <http://www.craigavonmcc.co.uk>

Location - Portadown, N. Ireland

Regular Club Racing - Yes, bikes and Large Scale cars

Practice - Yes

Suitable for - Stock, Moto-GP/Superbike, Nitro

Notes - check club website for details

Halifax: <http://halifaxtrack.co.uk/>

Location - Just outside Halifax town centre

Regular Club Racing - Yes, bikes, 1/8th, 1/10th and large scale.

Practice - Yes

Suitable for - Stock, Moto-GP/Superbike, Nitro

Notes - check club website for details

Other tracks

The BRCA series also visits some other tracks for nationals and the occasional ad-hoc race:

Mendip in the South-West - <http://www.mendiprccraceway.co.uk/>

Brookland in the South-East - <http://www.southeastrccc.co.uk/>

Adur in the South-East - <http://www.adurrc.org/>

Useful Links

On-road bike manufacturers:

KPDesigns - <http://www.kp-designs.co.uk>

RGEvolution - <http://www.rgevolution.com>

Nuova Faor - <http://www.nuovafaor.it>

Jabber - <http://www.clark-s.de/>

Eini Bike - <http://www.einitech.de>

Moto-3 M3R - <http://www.moto-3.com>

Off-road bike manufacturers:

ARX - <http://www.armodelling.com>

Anderson - http://www.andersonmodel.com/products/products_list.php?cid=34

Himoto - <http://www.himotoracing.com>

SkyRC- <http://www.skyrc.com/index.php?route=product/category&path=81>

Tyres:

Roadies - <http://www.clark-s.de/>

GRP - <http://www.grpgandini.it/>

PMT - <http://www.pmt-tyres.it/>

Shops:

KPDesigns - <http://www.kp-designs.co.uk>

Formby Models - <http://www.formbymodelshop.com>

Gregor's RCMotorradshop - <http://www.rc-motorradshop.de>

2Wheel Hobbies - <http://www.2wheelhobbies.com>

On-road tracks:

Aldershot - <http://aldershotmodelcarclub.net>

Craigavon - <http://www.craigavonmcc.co.uk>

Mendip - <http://www.mendiprccraceway.co.uk>

Southend - <http://www.southendrccc.org>

Halifax - <http://halifaxtrack.co.uk>

Cotswolds - <http://cotswoldmcc.co.uk>

Adur - <http://www.adurrc.org>

Forums:

Moto-5 - <http://www.moto-5.com>

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