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BRITISH RADIO CAR ASSOCIATION

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12TH ELECTRIC CIRCUIT SECTION

LMP12/GT12

Handbook 2020

BRCA 12e

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HOW TO USE THIS HANDBOOK

This handbook is aimed at competitors or officials of the 12th Circuit Section, LMP and GT classes, enabling them to have the information required for the national series 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 the general rules (ask an executive official, as appropriate, for clarification if you don't).

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. Section rules (as in this book) apply at Nationals plus other events, e.g. regional's, as sanctioned by the section committee. Section rules do not apply at clubs, unless the clubs wish them to and it is entirely the club's 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 think 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, so 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 - it's just that they volunteered to do it before you had the opportunity to offer to do it better.

BRCA 12th Electric Circuit Section Handbook 2020

Registered address:
BRCA c/o, 7 Buck Lane,
Hough, Crewe
Cheshire, CW2 5JP

LMP INTRODUCTION

Welcome to your new 2020 handbook.

One of the earliest electric RC racing classes in existence, 12th Scale can trace its roots back to the 1970s. Once the only electric RC track class, spawning champions in many other classes, 12th remains immensely popular in its own right, even as other RC electric classes have developed over the years. With the recent explosion in popularity of the GT12 class, the 12th Section caters for all ages and abilities across club, Regional and National competitions. These well-attended events now cover three classes – LMP12 (where it all started), GT12 and GT10.

We race indoors on a carpet surface so racing is all year round at clubs. The National series focuses on the winter months with races from October through to March.

Whether you're an occasional club racer or a pro-level driver, the 12th Section has something to offer you and we invite you to come and share experiences with us.

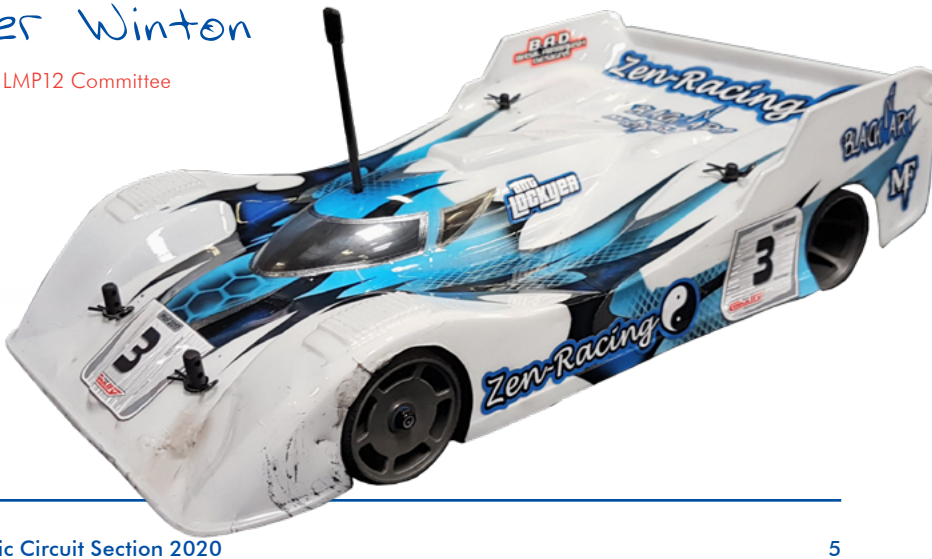
There are two distinct classes in 12th Scale – the LMP12 cars that are representative of the Le Mans Prototypes (hence LMP) cars that you see racing at Le Mans and in the World Endurance Championship (WEC) driven by the likes of Fernando Alonso and Sebastian Buemi.

Our other popular class is the GT12 cars which are representative of the FIA GT3 cars that contest the top championships across the world.

We run a series of races for our BRCA National Championships. In LMP12 we have classes for stock motors – everyone runs the same motor specification - and modified motors where motors are open and the cars are very fast. We also run a Sportsman Modified class with a controlled motor specification.

Peter Winton

Chairman, LMP12 Committee



GT12 INTRODUCTION

Welcome to GT Racing.

The GT Section is responsible for two main classes; GT12 and WGTR. We were created in 2014 as a sister section to the 12th Circuit Section.

GT12 is a fun, simple and competitive class that aims to provide simple, robust and fast cars that suit both absolute beginners and the seasoned racer alike. Easy to learn, difficult to master! GT12 cars are all simple "pan-car" style cars, using a 13.5Turn Brushless motor, 3.7V "1S" batteries and foam tyres.

WGTR provides very close wheel-to-wheel racing on rubber tyres, while still remaining similar to the other classes within the GT and 1/12th section.

GT classes are ideally suited to club racing, and there's bound to be an indoor club near you that you can race at. Additionally we support both regional and national championships for those who would like to take their racing to the "next level". These are always open to all racers, regardlessof ability, age, or anything else.

Should you wish to enter nationals, you can do so at brca.org/gt-circuit-events - our national series currently runs over 3 weekends,

but with separate meetings on Saturdays and Sundays; so if you can only make one of the days, don't worry! All venues provide pit tables, mains electric, chairs, and hot and cold food and drinks are available too

Matt Coverley

Chairman, GT12 Committee

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JIM SPENCER — Treasurer

treasurer@brca.org

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A BEGINNERS GUIDE

Taking up a brand new hobby is a somewhat daunting prospect for someone of any age or background. There's a lot to learn and take on board, often before you've really started out properly. RC car racing is no different, and in fact nearly always it will be of benefit to do some reading and find out the basics before committing to a purchase or making a decision.

This article assumes that you've already decided that RC racing is for you and that you're considering LMP12 as the class to start off with, or maybe you've previously raced another class such as nitro on road or electric buggies and are coming in to LMP12 for the first time.

The short checklist below outlines the milestones that you'll need to reach in order to go from 'having an interest' to 'going racing' in LMP12:

- Become a BRCA Member
- Find your nearest club that supports the LMP12 class
- Purchase the equipment you need
- Build/prepare your car and go racing
- Take your racing to the next level

Become a BRCA member

BRCA membership is important and should be the first thing to cross off your 'to do list'. For more information about what BRCA membership provides and why it is important, visit the BRCA website at www.brca.org. You can also use this link to join the BRCA online.

Find your nearest club

LMP12 cars are designed specifically for racing, which means they aren't suitable for driving up and down the street or in a local car park. Therefore it is strongly advisable to find out where your nearest club is that supports LMP12 racing and pay them a visit.

Finding your nearest club will not only allow you to establish where you will be able to race your LMP12 car, but also to start getting that thing which money can't buy: good advice! On your first visit to the club, ask the racers there about their LMP12 cars and the racing. What equipment do they use? How much does it cost and where do they buy it from? Are there any rules specific to the club that you need to be aware of? Establishing these things will lay the foundations for what comes next, give you a much better understanding of what LMP12 racing entails and hopefully enable you to make informed decisions on what to buy.

Purchase the equipment you need

LMP12 cars come in kit form and typically include the main chassis and suspension components along with a detailed assembly manual. There are lots to choose from and most of the major manufacturers make a competitive car. The simplistic nature of LMP12 cars means that pretty much all of the leading brand cars could be winners in the right hands. It usually comes down to how you build, setup and drive the car rather than one chassis having an advantage over another. Choose a car that seems to be popular and has good backup for spare parts and advice.

In addition to a chassis kit you'll need a full set of electrics including radio gear. It is typically a good idea to choose a radio system which has adjustable features such as steering end points and throttle & brake curves. Whilst a little more expensive these tend to be of better quality, have a faster response and will help you get the most out of your LMP12 car.

LMP12 cars use 1S Lithium Polymer (or LiPo) batteries. These have a nominal voltage of 3.7V and range in capacity from around 4000mAh to 8000mAh. There is a list of homologated packs that are legal for use at BRCA national events on the BRCA website.

LMP12 cars use brushless motors and compatible speed controllers which have what's known as a 'blinky' function. This refers to a flashing LED that will be visible when the speed controller is switched on and ready for use and indicates that the speed controller is not equipped with any complex dynamic timing advance (also known as boost or turbo). Be sure that the speed controller you purchase is suitable for use with 1S LiPo batteries; many of the entry level speedos are not. If in doubt, ask someone for assistance in choosing. With motors it is advisable to start off with a stock motor, so typically one with 13.5 or 10.5 turns. These are the most widely used motors at both club and national level. Remember; the lower the number of turns the more powerful the motor. As with batteries, homologation lists of approved equipment can be found on the BRCA website.

You'll also need a servo to power the steering on your car. There are several to choose from and they are of varying prices and quality. LMP12 cars use smaller sized servos than other RC cars so make sure that the servo you purchase is compatible with your chassis.

What good is a car if it's got no wheels? LMP12 cars use foam tyres and there are plenty available from different manufacturers in a range of compounds. The best advice we can give in this area is to choose a tyre brand that you're comfortable with and can get regular supply of and stick with it. Different manufacturer's wheels can have different offsets, so attempting to use multiple brands could leave you confused. Oddly, LMP12 tyre compounds are usually classified using colours rather than numerical shore ratings. The most widely used compounds are pink (30 shore) rears and magenta (32 shore) fronts. If you're unsure of what brand and which compounds to buy, ask for help.

A BEGINNERS GUIDE CONT...

There are a range of body shells available for LMP12 cars, all of which are styled on full sized Le Mans Prototype (or LMP) cars. Protoform is perhaps the most well-known and popular brand globally and their body shells have won countless British, European and World Championships. Other brands include BlackArt, Blitz and Bomber.

Finally, you'll need equipment to charge your batteries and a set of tools to use when working on your car. As with the other items above, seek advice online or at your local shop or club regarding what to buy.

Build your car and go racing

The most important thing here is to TAKE YOUR TIME. LMP12 cars are very sensitive, so try to be thorough when you build and prepare the car. Make sure all of the moving parts do so freely and try to avoid wires catching on the inside of the body shell. Time spent in properly preparing your car will pay dividends in the long term and you'll be able to get the most out of your chassis. There's a wealth of information available online and the drivers at your local club will be happy to help too; just ask them for advice on what they do.

By this time you should already have found your nearest club and have a good idea of how they operate. Take things slow and steady to begin with; concentrate on driving smoothly and consistently and the speed will build as you get more comfortable.

Take Your Racing to the Next Level

Once you've been racing at club level for a while you may find that you want to go and experience different tracks and meet new people. This is one of the great things about LMP12 and RC car racing in general; there's a vast network of people, clubs and events to engage with, whatever your level of ability and experience.

It may seem daunting, but actually one of the best ways to learn about LMP12 is to enter a national championship event. These events are open to anyone and there is sure to be someone else competing at your level. What's more, you'll have direct access to help and advice from the country's fastest and most experienced drivers. It is probable that you'll learn more in a single national weekend than during several months of club racing as in many cases you'll be able to pick up and understand the do's and don'ts from other people instead of having to figure them out for yourself. There is more information about this year's national events in this handbook

The Journey Begins Here

All that remains is for us to wish you the best as you embark upon racing LMP12. We hope that you enjoy it and that in doing so you remember these key bits of advice:

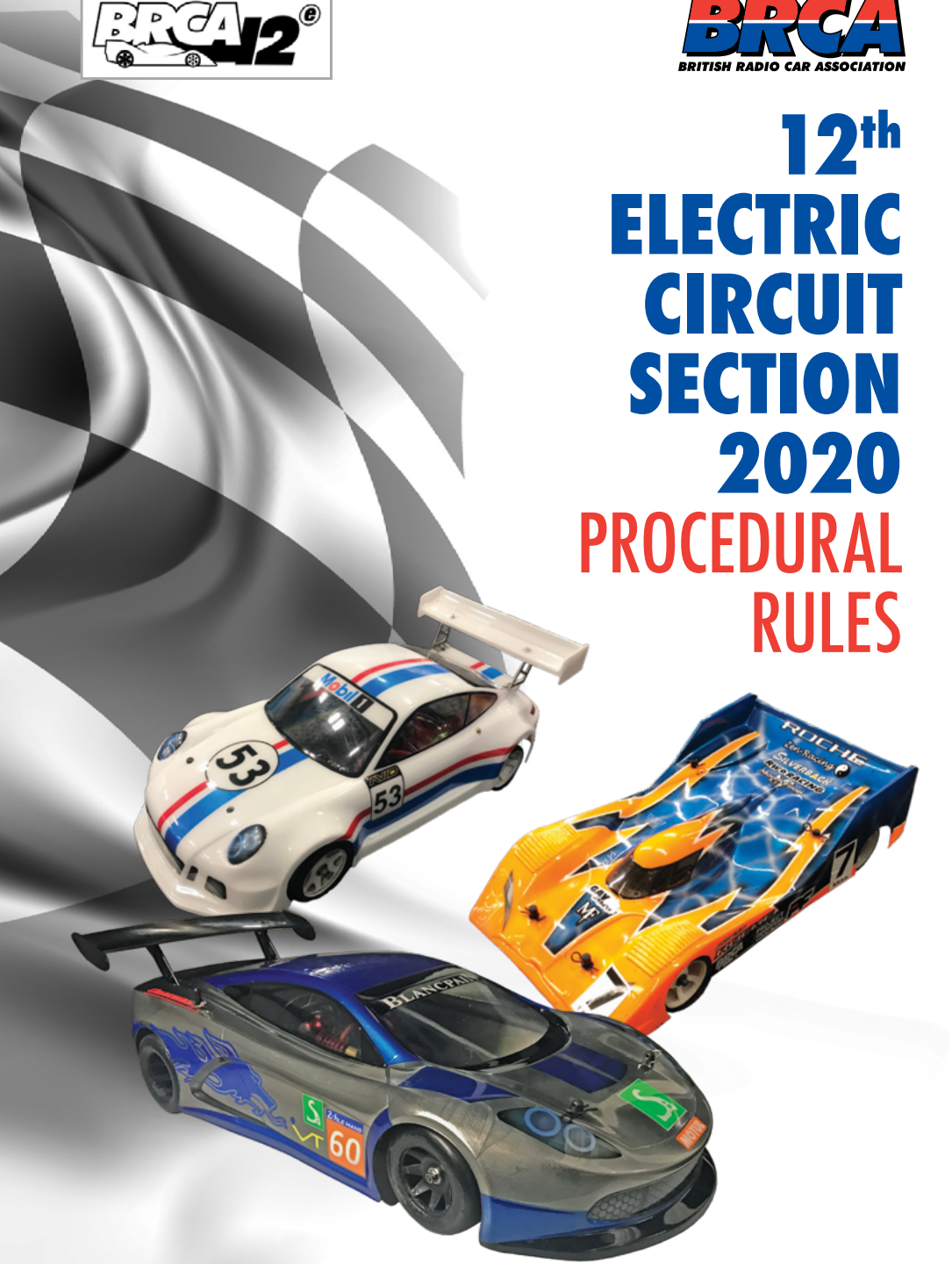
- Take your time
- Ask for help if you're unsure

Practice as much as you can See you trackside soon!

BRCA 12e

BRCA
BRITISH RADIO CAR ASSOCIATION

12th ELECTRIC CIRCUIT SECTION 2020 PROCEDURAL RULES



1. CLASSES OF RACING

1.1 LMP12 MODIFIED CLASS

1.1.1 Motors will be in accordance with LMP12 Construction Rule 3.

1.1.2 For Modified class speed controllers must be set in the approved mode and must be named in the list of eligible Zero-timing Speed Controllers (see Rule 4 and Appendix 2 in LMP12 Construction Rules)

1.1.3 Rule 1.1.2 is suspended for the BRCA 2019/2020 National season to align with the Modified class to be run at the 2020 IFMAR World Championships.

1.2 LMP12 SPEC CLASSES

1.2.1 Motors will be in accordance with LMP12 Construction Rule 2.

1.2.2 BRCA National Stock Championship will be for motors in accordance with the Electric Board "Brushless Spec. Motor lists" as updated from time to time.

1.2.3 BRCA National Sports Championship will be for motors in accordance with the Electric Board "Brushless Spec. Motor list" as updated from time to time. The minimum wind of the motor will be 13.5 turns with no maximum wind.

1.3 Competitors may only enter one LMP12 class on the same day.

1.4 GT12 SUPERCUP CLASS

1.4.1 Motors will be in accordance with GT12 Construction Rule 2 or 3.

1.4.2 BRCA National Championship will be for motors in accordance with the Electric Board "Brushless Spec. Motor (13.5T) list" as updated from time to time.

1.4.3 Speed controllers must be set in the approved mode and must be named in the list of eligible Zero-timing Speed Controllers (see Rule 4 and Appendix 2 in GT12 Construction Rules)

1.4.4 Cars may be fitted with additional parts not supplied in the rolling chassis kit (see Construction Rules 6.7 and 6.7.1) including a differential in the rear axle, replacements for other parts and home-made parts.

1.5 GT12 PRODUCTIONCUP CLASS

1.5.1 Motors will be in accordance with GT12 Construction Rule 2 or 3.

1.5.2 BRCA National Championship will be for motors in accordance with the Electric Board "Brushless Spec. Motor (17.5T) list" as updated from time to time.

1.5.3 Speed controllers in GT12 classes must be set in the approved mode and must be named in the list of eligible Zero-timing Speed Controllers (see Rule 4 and Appendix 2 in GT12 Construction Rules)

1.5.4 Cars may be fitted with additional parts not supplied in the rolling chassis kit (see Rule 6.7 and 6.7.1) including a differential in the rear axle and replacements for other parts. Parts or components that break or wear out will be replaced "like for like", or as close as possible if those parts are no longer in production.

1.6 GT12 ProductionCup and SuperCup classes will only run in separate heats if there are more than 20 entries.

2. GENERAL STANDARDS FOR BRCA SANCTIONED MEETINGS

2.1 Sanctions are only granted, on application, by the BRCA LMP12 Committee (for LMP events) and the BRCA GT Committee (for GT events). All submissions must be received for consideration by the date of the Section conference; the calendar will be published before the start of the next season. Dates are subject to 'force majeure'.

2.2 Nationals must be arranged by a club/organisation unless 'force majeure' dictates otherwise.

2.3 Race control PA to be available to all drivers.

2.4 Health & Safety. BRCA General Rules – see BRCA Handbook. The main straight and any associated sweeping corners must be fenced or located so they are adjacent to the building walls.

3. ADMINISTRATION

3.1 Details of entry must be made available at least 28 days before the closing date of the event. Entries will be limited to 10 heats on each day. Entries and subsequent heat allocations by class must be dealt with on a first come first served basis.

3.2 Entries for a meeting must only be accepted from current BRCA members and must be accompanied by their BRCA membership number. The entry fee will be set annually at the section conference and stated on the entry forms.

3.3 Entries are to be done via the Qualifying Officer for all events; reimbursement to the clubs will take the form of a percentage of the entry fee, paid to the club after the event.

3.4 Entries to be sent to the Qualifying Officer, including payment, to his satisfaction, and pre paid at least 2 weeks prior to the meeting. Entries cancelled 2 weeks before the event will receive a full refund. The qualifying Officer may make exceptions to this Rule at their discretion to help drivers.

3.5 Late entries, accepted by the qualifying officer, will be subject to a levy of £5 per day

3.6 All BRCA Sanctioned meetings must use 1/12 section approved timing and automatic lap counting equipment.

Organisers' must check acceptable venue layouts by sending a detailed A3 sized sketch to the committee, at least two weeks prior to the event.

3.7 In the event that 10 or more places remain available after the closing date for entries, the host club may offer a support class of their choosing, subject to the approval of the committee. All race fees collected for support class entries to go to the host club.

4. OFFICERS OF THE MEETING

4.1 A sanctioned event must have the following officials provided by the organising club:

A. Race Director, who must be present at race control throughout the timed heats and finals.

B. Chief Scrutineer, who will ensure that all cars meet the requirements of the general and motor specifications.

C. Chief Timekeeper, who will check that timing equipment is operational and that all races have been started and finished in accordance to the rules.

D. A track repair and maintenance nominee, who will ensure that all necessary track repairs and general maintenance/facilities tasks are carried out in a timely and satisfactory manner.

4.2 The BRCA Steward has absolute authority at race meetings and for interpretations of the rules.

4.3 A Referee for each Heat and Final allocated by the BRCA Steward – see Rule 7.5

4.4 Each official must be a separate person; no one person can fill more than one post at a meeting.

5. REFEREES

5.1 Provision shall be made for a Referee in all heats and finals. This will usually be a racer or racers nominated by the committee, these racer(s) will referee instead of marshalling. Failure to referee will bring the same penalty as failure to marshal.

5.2 The nominated racer(s) in rule 5.1 are to be announced at drivers briefing.

5.3 The Referee should have an unobstructed view of the entire track, and preferably a view of the drivers on the rostrum.

5.4 The Referee may request drivers to allow a faster car to overtake, issue warnings to drivers, and issue penalties to drivers, refer to Rule 11 and Guidelines for Referees.

5.5 A microphone will be provided for the Referee, to allow clear communication to the driver's rostrum.

6. TRACK SPECIFICATIONS

The track should be positioned to minimise any unfenced (over and above the track edging) track edges accessible to the public or racers.

6.1 The width of track is to be measured between the tape markings or barriers whichever is the narrower.

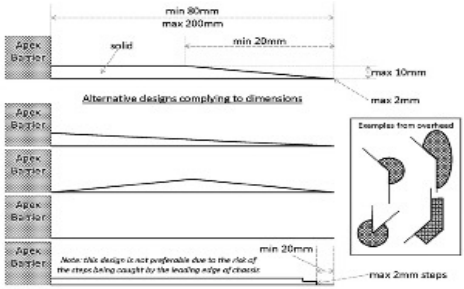
6.2 Minimum track width is 2m.

6.4 Corner cutting must be discouraged by the placing of adequate corner markings and barriers.

6.5 Track marking equipment must be such a shape and size to prevent the entrapment of a car or the driver's view becoming obscured. All track markings to be square shaped. All track markings must conform to the guidelines specified by the committee – see the BRCA Track Guide for details.

6.6 Corners with an included angle of less than 135deg shall be marked with solid marker disks, complying with the following dimensions:

- Outer edge distance from barrier apex - min 80mm, max 200mm
- Maximum overall height - 10mm
- Maximum vertical edge at any point - 2mm
- Minimum distance between any two horizontal surfaces - 20mm. See following diagrams for examples.



Deviations from these dimensions can be agreed by the steward of the meeting. The marker disks shall coloured to contrast the barrier and track surface. Suggested colours: neon yellow or orange.

6.7 The start, 1m penalty and finish lines must be clearly marked on the track. The start line must be placed so that race officials have a clear view to identify any jump starts.

6.8 Drivers must have a clear view of the full track from any position on the rostrum. The rostrum must be positioned to minimise the risk of people obstructing the drivers view. The minimum distance from the rostrum to the edge of the track is 2m. The minimum length of the rostrum must be 7.3m (24ft), between 1m (min) and 2.1m (max) high, and of a suitable width. For finals the drivers will take their positions in qualifying order to allow them their preferred position.

6.9 The main straight must be on the opposite side of the track to the rostrum.

6.10 No competitor should be pitting in the area designated as race control.

7. RACING PROCEDURES

7.1 Drivers must be seeded on handicap for qualifying

7.2 Heats and finals shall be of the following duration plus the time to complete the last lap, to a maximum of 30 seconds;

LMP Classes – 8 minutes

GT12 - 6 minutes

7.3 Competitors shall race one round of controlled practice, the length of which to be determined by the race director and/or Time keeper and a minimum of 3 heats. Practice on Saturday night is permissible, provided this is on the confirmation of entry. Drivers are to be advised of the number of rounds at Drivers briefing.

7.4 A driver's best single heat time result will count towards a place in the final. In the event of 2 or more competitors having the same qualifying time after the completion of the last round of qualifying the next best qualifying time posted by these competitors will be used to determine grid position. For example, competitors A and B both have a best time of 44 laps 485.76s. Competitor A's next best time is 44 laps 489.88, whereas competitor B's next best time is 44 laps 488.63. Therefore competitor B would get the higher starting position.

7.5 Drivers must marshal 1 Heat after their own race, unless they have been designated as Referees (see 5.1). All marshals must be BRCA members and have attended the Drivers briefing (or at least been asked to) and have received Section marshal training. If a competitor is unable to marshal for any reason then they must provide a suitable substitute after seeking permission to do so from the meeting steward. Failure to marshal or provide a substitute in qualifying will result in the loss of that competitor's fastest qualifying time. Failure to marshal or provide a substitute during finals will result in disqualification from the event.

7.6 The Race Director or Referee are to make sure there are sufficient marshals and that they are suitably spread around the track

7.7 Competitors may only drive during their race and then only from the rostrum. Competitors not in the race must not interfere with the progress of any driver within a race. No Driver to leave the rostrum until the race is declared over or unless instructed to do so by the Race Director.

7.8 Heats will start with cars in one line across the track and will use a 0.5 second (minimum) staggered start system. All cars must be started before the completion of one lap by the leading car with all cars clocks starting within 15 seconds of the first cars clock.

7.9 Grid: to be on the main straight and any proceeding or following flat out corners. Pole position: 10 meters from the first effective corner, following cars spaced equal distance back to next effective corner, on the racing line.

7.10 A race may not start unless in the presence of the Race Director or deputy or the appointed Race Referee.

7.11 In the event of interference being evident before the start of a race a 2 minute delay may be applied, or longer at the Race Directors discretion. All cars must remain on the track or under the Race Directors control.

7.12 At 30 seconds prior to the start, all cars must be in position behind the start line, after this time any car not at the start line must wait behind the other cars. At 10 seconds drivers will be given warning of start of race, after this point no car may be in front of the start line or a start penalty will be awarded. The race will start at the discretion of the Race Director. In the case of staggered start format, drivers will start as instructed.

7.13 Only the Race Director or deputy or the appointed Race Referee may call for a restart within the first lap of the leading car.

7.14 Only the Race Director, deputy, the appointed race Referee or BRCA steward may abandon a race. If deterioration of the track stops the progress of any car then the race must be abandoned. All abandoned qualifying heats will be re-run. If a qualifying race is stopped after one lap has been completed then time must be allowed for recharging. If a final is abandoned before 1 minute is complete then 5 minutes will be allowed to recharge and the final will be re-run. If a final is stopped after 1 minute but with less than half of the race time elapsed then the race will be declared based on qualifying positions. If a final is abandoned with more than half of the race time elapsed then the race result will be declared on the running order at the end of the last fully completed lap by each competitor. The race time at the point of abandonment shall be determined as the elapsed time at the last completed lap by the car which is impeded.

7.15 The BRCA Steward will decide if a transmitter compound will be used during the meeting. This decision may be taken in advance, or may be implemented during the meeting if deemed necessary by the BRCA Steward. If a

transmitter compound is in use:

Prior to the track being open, all transmitters must be removed from the pit area and placed in a designated transmitter compound as directed by the BRCA Steward. Except when racing, transmitters must remain within the compound until the track is declared closed for the day.

Transmitters may be removed by individual competitors at the Race Directors discretion.

7.16 Each car will be inspected to ensure that it meets the requirements of these rules for every race in which it competes.

7.17 Qualifying results will be posted after every round. Final results will be posted at least 10 minutes before prize ceremony.

7.18 The trophies or prizes will be awarded at the end of the meeting.

7.19 The committee recommends the use of a referee to assist drivers in all heats and finals.

7.20 During a race, no-one other than the Race Control officials can pass any information to a competitor, this does not include drivers requesting one another to allow overtaking – or passing on information to each other regarding cars that have stopped on the circuit.

7.21 It is the drivers responsibility to ensure the correct transponder is securely attached to their car and working. If the equipment should fall off, the car will not be counted.

8. CURTAILMENT PROCEDURES

8.1 In the event of at least two complete rounds of qualifying being run but the finals not being run or stopped at less than 2/3rds distance then the awards will be made from qualifying positions.

8.2 In the event of 'force majeure' the BRCA Steward may declassify the meeting. The decision must be made on the day. Entry fees are to be refunded if the meeting is declassified.

9. FINALS

9.1 Points for the open championship will be awarded as follows, 150 points for 1st place in the A final down a point per place.

9.2 A separate championship may be run alongside the Open for F2 and F3 drivers. Top driver in each class gets awarded the following points, down one point a place in the formula, F2 100 points, and F3 50 points.

9.3 Drivers will stay in their formula for the whole season.

9.4 New drivers without a handicap, or who have not completed four meetings counting towards a handicap, will be placed in F3. After the completion of four meetings counting towards a handicap, drivers will be placed in the formula corresponding to their handicap, where they will stay for the rest of the season.

9.5 Any points scored in F3 will be carried forward to F2.

9.6 A team consisting of four competitors is entered at the beginning of the season (no changes or substitutions will be allowed. The best three competitor's scores count at each event.

1 point will be scored for winning a final regardless of which final. 2 points will be awarded for second place and so on. Best 4 out of 6 to count for the championship. The team with highest placed driver would determine the winner in the event of a tie. Any team unable to field a full team at an individual meeting will score 100 points. The lowest team score per event is deemed the winner. Event scores are accumulated with best four counting towards the season championship. (The lowest score wins). Entry fee per team is £10 at the start of the season. Monies raised will fund end of season Trophies.

9.7 Separate qualifying and handicap tables for each championship will be kept.

9.8 A permanent trophy is to be presented to TQ in each class, the top three drivers in the A final, the top-3 drivers in F2 and F3 and the winner of each lower final. Drivers may collect more than one trophy at a single meeting. Other trophies are at the discretion of the organisers.

10. SECTION CONFERENCE

10.1 The 1/12 section conference to be held within 8 weeks of the last National of the season. Committee availability and clashes with other classes of racing (BRCA Sanctioned events only) must be taken into consideration when deciding a date, it will be the target of the committee to hold the conference within 4 weeks of the last national. The Committee are to investigate possible alternatives for the date, time and venue of the EGM.

10.2 Separate conferences shall be held for GT and LMP, preferably on the same day at the same venue.

11. PENALTIES

11.1 Jump-starts during qualifying - Crossing the loop out of sequence may result in a 5 second penalty. Jump-starts in a final will result in a fixed 5 second penalty at the end of the race, or a stop/go penalty.

11.2 Failure to marshal or provide a substitute in qualifying: loss of fastest qualifying time. Failure to marshal or provide a substitute during finals: disqualification from the event. Failure to marshal competently- loss of

previous time or final result.

11.3 Corner cutting: - if a competitor cuts a corner deliberately or as a result of an accident then they must wait for the referee to instruct them to continue or wait for a marshal to return their car to the point at which it originally left the track. Failure to do so will result in a 1 lap penalty being applied at the end of the race.

11.4 Technical inspection: - failure to meet the technical and dimensional requirements of these rules results in loss of heat/final time.

11.5 The Black flag will be shown only by Race Director, Referee or deputy. The car it applies to must stop and be removed from the track unless otherwise instructed. Any car that loses its body, becomes a safety hazard , is causing damage to the track and/or driving incompatible with general safety will be Black flagged.

11.6 Any car that is intentionally or continually running into other cars so as to slow their progress will be issued with a penalty and/or warning by the Referee, and if it continues will be Black flagged.

11.7 A car that is Black flagged is disqualified from that race until instructed to rejoin by the Race Director or Referee.

11.8 If a race is subsequently abandoned a Black flagged driver can only take part in the rerun at the Race Directors discretion.

11.9 Three successive warnings and/or penalties lead to disqualification from the meeting.

11.10 There will be a ten minute protest period between the end of qualifying and the start of the finals.

11.11 Any driver leaving the rostrum without direction from race control during qualifying will lose their FTD. Any driver leaving the rostrum without direction from race control during finals will lose their championship points for that round.

12. CHAMPIONSHIP MEETINGS

12.1.1 The LMP championship will consist of a maximum of 6 events in the following format:-

- 'Stock Spec' class on Saturday consisting of 13.5T and 17.5T classes. Only the 13.5T championship will be split based on formulas (F1 and F2).
- 'Sports' class on Sunday.
- 'Modified' class on Sunday.

The number of events to count towards the championship to be half plus 1, with halves rounded down.

12.1.2 The GT12 Championship will consist of at least 3 events, in the following format:

- GT12 on each Day of the event, with each Day consisting of a separate Round of the Championship.
- A racer's best 3 Round points results to count toward championship position.
- GT Nationals will include a Junior Championship for racers who are under the age of 16 at the first GT National meeting of the season.
- GT Nationals will include a Veteran's Championship for those who are over the age of 50 at the first GT National meeting of the season.
- Prizes for Junior and Senior Championships will be at the discretion of the GT committee.
- These championships will be counted based on Qualifying times, with the fastest racer meeting the age requirements gaining 150 points for that round, and the second 149, and so on.

12.2 In the event of a tie the competitor's best individual counting score will be taken into consideration, then next best counting score and so on. If there is still a tie then qualifying positions for counting scores will be taken into consideration. Throw away scores will not be considered.

12.3 All meetings to be held indoors on carpet.

12.4 Competitors will compete within the designated classes depending on their handicap (rating) as calculated by the Qualifying Officer. The formula breaks shall be chosen so as to produce as near as possible equal split of eligible drivers. Drivers with fewer than the required number of counting scores will be excluded until they have achieved an eligible rating. The formula breaks shall be confirmed at the section EGM. A +/- 1% buffer zone applies at the end of the season. Within this zone, the driver can elect whether to move up or down themselves, prior to the start of the following season.

12.5 Single day meetings: Four rounds of qualifying will be run, time permitting.

Two day meetings: Two rounds of controlled practice will be run, time permitting. Seven rounds of qualifying will be run, time permitting. Three leg finals will be run

12.6 In the case of three legged finals, the points for the best two legs are added together for overall position in each final, in the event of a tie the overall position is decided by the best counting score is used.

12.7 On single day meetings there will be one leg of finals.

12.8 Qualifying heats to contain a maximum of ten (10) cars. Drivers to be spread evenly across the qualifying heats as deemed acceptable by the Qualifying Officer or Steward of the Meeting.

Competitors will be given the opportunity to run in a final. The finals must be in A, B, C… format. All finals will consist of ten cars with the exception of the lowest final. Four rounds of qualifying will be run, time permitting.

12.9 Electric "Air Blowers" are not allowed at GT National Meetings.

13. INTERNATIONAL TEAMS

13.1 Where applicable Team selection shall be based upon exact handicaps. These handicaps will be based on the current results. Drivers must have competed in enough meetings to eligible for the Championship, see rule 10.6. The 1/12 committee may allocate up to 20% of the available places for EFRA/IFMAR events at their discretion to cater for reallocation.

14. PROTEST PROCEDURES

14.1 Protests must be received by the BRCA Steward in writing with a fee of £20.00. This fee is refunded if the protest is upheld.

14.2 No protests will be accepted after prize giving ceremony.

14.3 If any protest is made against a competitor, then that protest must be held in the full knowledge of that competitor. The accused competitor will be consulted and allowed to defend his actions before a decision is reached.

The following are not Rules, but are included as notes to clarify what is intended by Rules above. They are to be used in conjunction with the Rules as the proper execution of the intent of the Rules.

GUIDELINES FOR REFEREES

Referees will be provided access to the race control computer (or monitor) for reading race positions and lap scores during the race

At least one Referee must be present in Race Control watching each Heat and Final, and should be watching for

- Bad sportsmanship by drivers - i.e., deliberately impeding the progress of others by slowing down, crashing or hitting another car, corner cutting, driving recklessly to gain an advantage and/or being unable to properly control a car such as to cause a potential safety hazard.
- Cars in a dangerous condition - i.e. body not secured to chassis, causing damage to carpet, tape or track markers, and a safety hazard to marshals.
- Jump starts
- Corner cutting (without any deliberate intent)
- Proper execution of any penalty awarded by a referee
- Bad driving

Penalties can be issued as follows by the Referee, and be within these parameters for consistency:

- Bad sportsmanship - disqualification from that Heat or Final, or disqualification from the Meeting at the Referee's discretion.
- Cars in a dangerous condition - Black Flag (see rules 10.4, 10.6)
- Jump starts - in qualifying for starting out of order
- 5 sec penalty. In finals for moving after the 30 second warning, but before the start signal - 5 second penalty
- Corner cutting - 1 lap penalty. Referees may also allow a driver to wait, and then tell the driver to rejoin the race, to prevent any safety issues with other cars or marshals entering the track area.
- Improper execution of a penalty - repeat of the penalty until it is correctly carried out to the Referees satisfaction. This counts as single penalty for purposes of disqualification.
- Bad driving - stop/go penalty of up to 10 seconds, to be issued and supervised by the Referee.
- If three penalties are issued to one driver by the Referee during the Meeting (single day, single class) the driver is disqualified from that Meeting.

Referees may warn drivers as to their driving conduct without issuing a penalty, and ensure that when a penalty is awarded, it is clearly stated as a penalty. The penalty must be marked on Race Control's copy of the heat/final results.

12TH LMP HANDICAP RATINGS

Handicaps are calculated as follows, based on heat times not finals;

a) The average of the best qualifying lap times of the top 10 drivers is taken as the norm (N)

b) Each competitor's best qualifying lap time (T) is then compared against the norm (N) in the following formula; ((N – T) / N) x 100 = % difference (D)

c) The existing handicap rating of the top 10 drivers, excluding those without a valid handicap, is then averaged to give a "Meeting Score". (M) This reflects the standard of the drivers attending.

d) Then each driver's D is added to the meeting's M to give their rating for that event.

e) This figure is then included with the driver's three previous results. The lowest of the four is ignored and the remaining three are then averaged and rounded to 2 decimal places before publishing.

New drivers without a handicap will be placed in the open championship for their first meeting. After the completion of their first meeting, the qualifying officer will assess their performance based on their qualifying and drivers will be placed in a formula appropriately. Once a driver has completed 3

meetings counting towards a handicap, their formula placement will be reviewed and amended at the committee's discretion.

TRACK DESIGN AND MARKINGS

Organisers will consult the BRCA 12th Section Track Design Guide and will wherever possible set out tracks that follow those guidelines. In matters of safety, the BRCA Steward may request changes to the track layout and markings before racing starts on the day of the BRCA Sanctioned event (National) in order to comply with the Track Design Guide.

GT12 DRIVER ABILITY RATING & CLASSES

A Driver's ability rating (handicap) is calculated from qualifying positions at GT nationals, as follows:

- The driver to qualify first in a round gets an ability score of 100% for that round. The rest of the drivers at that meeting get an ability score calculated from the average lap of the top qualifier divided by their own average lap time from their best run, expressed as a percentage.
- A driver's best 3 of the last 4 ability scores is averaged to give an overall ability rating. This can increase or decrease, with a driver's performance as they attend further events.

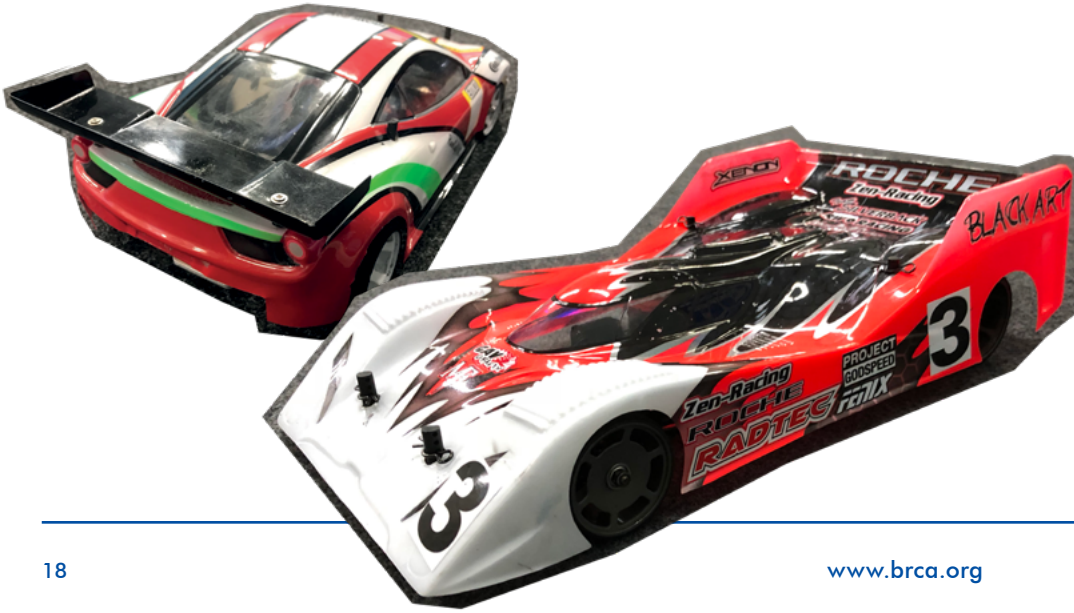
To calculate a Driver's GT Class for the start of a season:

- Drivers that have competed in 3 or more national events during the previous 2 seasons are compiled into a list and sorted by their ability rating.
- This list of drivers (e.g. 123 drivers) is split into 3 equal as possible groups to create a GT1, GT2 and GT3 class (e.g. 41 drivers in each class).
- The ability rating of the lowest person of one group and the ability rating of the highest person of the following group are averaged to give the "cut off ability score" for GT1 and GT2 respectively. E.g. GT1 is 94.05% and above, GT2 is 90.24% and above, with GT3 the remaining drivers below these cut offs.
- Drivers remain in their GT class for the rest of the season to compete in the championship for that Class. At the start of the next season when the Classes are recalculated, drivers might move up or down GT Classes.

For Qualifying, all drivers entered are sorted into a list by their ability rating, which is used to calculate the heat listing order. For Finals, drivers are ordered based upon their qualifying position.

Where a driver has not yet competed enough meetings to have an ability rating (or GT Class/ Grading):

- They will start with no ability rating and be assigned a position in the heat listing for their first meeting by the committee, BRCA Steward and race director.
- After qualifying at their first meeting, they will be assigned a provisional GT Class based on their ability score at that meeting, (by comparing against the "cut off ability score" for GT2 and GT1), and then placed into a suitable final in that Class based on their qualifying position.
- They will compete in this GT Class for the remainder of their first season, scoring points as normal. After the first season is complete, if they have completed enough meetings to have an ability rating, then they will be assigned a GT Class as appropriate.



BRCA 12e

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BRITISH RADIO CAR ASSOCIATION

12th ELECTRIC CIRCUIT SECTION 2020

LMP12 CONSTRUCTION RULES

1. CONSTRUCTION RULES

1.1 The essence of the sport of Radio-controlled car racing is competition between realistic models of racing automobiles. All cars must comply with dimensional requirements stated in these Rules.

1.2 Minimum weight is 730 grams.

1.3 Wheel rim diameter maximum is 38mm and minimum of 30mm.

1.4 The tyres must be black except for side wall detail.

1.5 Tyre treatments are permitted at the organiser's discretion and are the user's responsibility. Organisers who ban use of specific products should state on the entry forms. Flammable and toxic substances are not recommended.

The BRCA has not yet found a substance that it can recommend for the treatment/cleaning of tyres. The BRCA draw organiser's attention to the possible hazard created by large numbers of competitors using tyre treatments in a confined space.

The BRCA recommend that the competitor adheres to the methods of usage as stated by the supplier of the treatment. A list of legal additives will be published prior to start of each season. New additives may be added during the season, subject to approval by the BRCA 12th section committee. Additives may also be removed during the season should they be deemed unsuitable by the BRCA 12th section committee. Tyre additives used trackside to be kept in their original containers.

1.6 Tyres must have a minimum width of 13mm and a maximum width of 38mm.

1.7 Wheel nuts and/or axles must not protrude more than 2.0 mm beyond wheels. No more than 1.5 mm of wheel outer side may be exposed (not covered with rubber) on the outer edge of wheels.

1.8 Bumpers may be fitted but must be designed to minimise injury that could result from being hit by a car, also to reduce the risk of damage to other cars. Rigid bumpers made from non-resilient materials such as metal are not allowed. Other sheet materials should have an edge radius not less than 1.5mm.

1.9 Only one wing is allowed on the car, maximum dimensions to be, width 172mm, chord 51mm, unless the original had more than one wing. The second wing must be to scale within 10% in size and location

1.10 Overall maximum width of the rolling chassis to be 172mm.

1.11 All cars must have transparent windscreens, unless the actual car did not have transparent windscreens.

1.12 Side and/or rear windows, if any, must be clear or open.

1.13 A driver figure, if fitted, must be painted in realistic colour and garb.

1.14 All cars to have clearly visible identifying numbers to the Race Directors satisfaction.

1.15 Numbers must be at least 25mm high with minimum stroke of 4mm. They must be black numerals on a white background.

1.16 No portion of the chassis, wheels and tyres or any equipment may extend beyond the body, except rollover masts and four posts for the purpose of mounting the bodyshell

1.17 Roll-over masts/antennas may be fitted. When fitted the mast must have a safe blunt end. The minimum height of the rollover mast is 150 mm from the track surface. Rollover masts/antenna will be made from fibre-glass or carbon-fibre only, with a minimum outside diameter of 2.9 mm and a maximum outside diameter of 3.4 mm.

1.18 Openings in the body or cockpit floor other than ones appropriate to full size cars shall be kept to a minimum.

1.19 Wheel cut-outs may not be more than 10mm larger than the tyre radius. Exception- scale size and/or shape wheel well cut-outs. Wheel wells must be cut out if the original cars are cut out.

1.20 When initially entered in a meeting the body shell must be neatly finished and complete.

1.21 Body and chassis must be securely joined at all times while the car is on the track.

1.22 Only one drive motor is allowed per car.

1.23 Body shells must meet the requirements shown in Appendix 1 to these Rules.

Body shells must be approved by the Committee, a list of approved shell will be maintained on the BRCA website.

1.24 The minimum ground clearance of the car, not including the spur gear, is 3mm; this will be checked before each qualifying heat and final race.

1.25 Only Personal Transponders will be used to record laps. The section will have Personal Transponders available for competitors to purchase.

1.26 The rear axle must not have any articulated element and may be fitted with a differential (one solid rear axle). Only a single fixed ratio transmission is allowed. Cars may only have two driven rear wheels with the drive being to the rear axle. No independent rear suspension is allowed.

2. DEFINITION OF A SPEC MOTOR

2.1 Motors allowed – Spec, or Stock, class. Any

motors listed in any of the Electric Board "Brushless Spec Motor" lists as updated from time to time.

2.2 Motors must conform to the relevant technical specifications detailed in the Electric Board Rules.

3. DEFINITION OF A MODIFIED MOTOR

3.1 Any approved motors from the EB Modified motor list can be used, star or Y winds only. Motors from the 10.5T, 13.5T and 17.5T lists can also be used, but only with the number of turns as homologated. This rule is to align with the Modified class to be run at the 2020 IFMAR World Championships. This change would apply until the 2020 AGM after which it will revert to the minimum wind of motor being 6.5 turns.

3.2 Motors must conform to the relevant technical specifications detailed in the Electric Board Rules.

4. DEFINITION OF A ZERO-TIMING SPEED CONTROLLER

4.1 Speed controllers may not be equipped with any form of automatic or programmable timing advance. If this feature is available on the particular speed controller it must be disabled and placed in an approved mode - i.e. the "ROAR blinking LEDs mode." Brushless Speed Controllers built without automatic or programmable timing advance will be allowed. The BRCA 12th Committee will provide a list of eligible speed controllers. Details of the requirement for the approved mode are contained in Appendix 2 – Zero-Timing Brushless Speed Controllers – and this requirement must be met for a speed controller to be eligible for racing in relevant 12th Classes (see Procedural Rule 1)

5. BATTERIES ALLOWED

5.1 Any cells conforming to the current Electric Board battery list.

5.2 Cars will be powered by cell/s with a maximum nominal voltage of 3.8v

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THE FOLLOWING APPENDICES ARE PART OF THE RULES ABOVE

APPENDIX 1 - BODYSHELLS – (CONSTRUCTION) RULE 1.23

The following is the specification for approval of 1/12 Prototype Sports car body shells. They should be used by the Section to enable clear and consistent application of standards for future approvals,

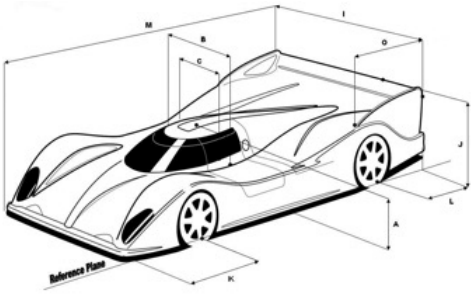
1. Lower body cut line is to be used as the reference plane for all height dimensions.
2. Minimum cockpit height – Closed cockpit – 55mm (Excluding any air scoops / air boxes)
3. Minimum cockpit width – Closed cockpit – 70mm (Measured at the point it intersects with the side pod)
4. Minimum cockpit width - 55mm (measured at the lower window line)
5. Minimum Roll bar height - Open cockpit - 55mm
6. Maximum distance from Drivers helmet to top of roll bar – Open cockpit -11mm
7. Minimum cockpit width - Open cockpit - 65mm (Measured at the point it intersects with the side pod)
8. Minimum front wheel arch height – 46mm (Including vents) (measured at a point 15mm from edge of body)
9. Minimum rear wheel arch height – 50mm (measured at a point 10mm from edge of body)
10. Maximum overall width – 176mm
11. Minimum overall width – 168mm
12. Max wing / spoiler height – 65mm
13. Max front overhang (From centre of front wheel)– 70mm
14. Max rear overhang (from centre of rear wheel) – 70mm
15. Max length overall – 340mm
16. Minimum side pod height – 30mm
17. The side dam must blend fully (disappear) into the main body shape within 110mm of the rear edge of the body/side dam.
18. Max side dam height – 72mm
19. The body side forward of the side dam must have a radiused edge, no lips or upward extensions are acceptable
20. Bodies must be a representation of a full size LMES / ALMS / LMP / WSC prototype.
21. Open cockpit cars to have twin roll bars as current LMES / ALMS
22. Open cockpit cars must have a representative drivers helmet and cockpit opening
23. The name of the prototype must be used for the homologation process.
24. The name of the prototype does not have to be used for general sales and marketing.
25. Only fins or strakes that are present on the full size prototype will be allowed.
26. Cut-outs in the shell will be allowed only if clearly

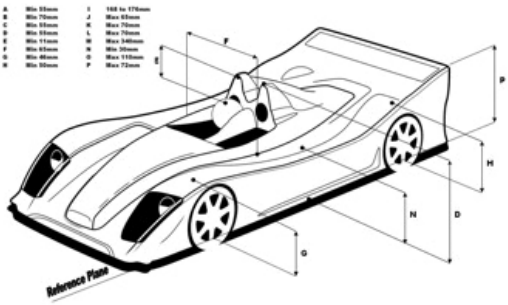
defined on the full size prototype

27. Once Homologated there must be no changes to the design, trim lines, detail lines or any feature of the body. All changes will require resubmission for approval and an additional revision letter added to the part number- Example 15001A - Original - 15001B for a 2nd Rev. Etc

    The manufacturer's part number must be clearly marked on the shell alongside the windscreen area.

Note, original Rule 26 removed. "The body must not be cut above the lower cut line"





Body Specifications 1/12th Scale On Road

APPENDIX 2 – 'ZERO TIMING' BRUSHLESS SPEED CONTROLLERS – (CONSTRUCTION) RULE 4

'Zero timing' brushless speed controllers

A speed controller that has a 'zero timing profile', that does not alter the fixed position pre-set mechanical timing of the motor in any way and disables any advanced motor control; functions (ie. Boost, Cheat mode, Turbo etc.). This profile is known as ' Boost 0'.

The commutation sequence is limited to "6-step" type and commutation of the Speed control must follow the motors hall sensor signals 1:1. Therefore no change of timing (either advance or retard) is allowed at any RPM. When the "Boost 0" profile is activated, it will be identified by a blinking LED or LEDs while the ESC is armed and in neutral position.

The BRCA 1/12 Electric Circuit Section reserves the right to retain a speed controller and motor after the conclusion of a meeting to measure its performance against the above criteria in a controlled environment. The equipment, or identical new replacements, will be returned to the competitor within 5 working days. Sanctions may be taken against a competitor and/or manufacturer if a controller is found to be non-compliant.

V1.0 – EGM rule changes added – 8-October 2012
V1.1 – Classes aligned – 9-September 2012
V2.0 – EGM rule changes added – 28-July 2013
V3.0 – EGM rule changes added – 27-May 2014
V3.1 – LMP12 Procedural rules separated – 17-October 2014
V4.0 – EGM rule changes added – 2 September 2015
V5.0 – EGM rule changes added – 16 August 2016
V6.0 – EGM rule changes added – 7 August 2017
V7.0 - AGM rule changes added - 27th Sept 2018
V8.0 - AGM rule changes added - 2nd August 2019

BRCA 12e

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BRITISH RADIO CAR ASSOCIATION

12th ELECTRIC CIRCUIT SECTION 2020

GT12 CONSTRUCTION RULES

BRCA GT12 TECHNICAL RULES

This class is based on the principals of close, fair and low cost racing. This will make it both an ideal entry level class for the driver who wishes to try his or her hand at RC racing for the first time, but the rules for the class will also cater for the more competent driver who wishes to take their racing further. The performance of each car is more dependent on driver ability and good setup than on budget.

The Rules outlined below may not necessarily cover every single aspect of car construction – drivers are required to follow the spirit and intention of these rules if any ambiguity is discovered.

1. CONSTRUCTION RULES

1.1 The essence of the sport of Radio-controlled car racing is competition between realistic models of racing automobiles. All cars must comply with dimensional requirements stated in these Rules. All cars will use replica GT shells from the list of eligible shells given in Appendix 1.

1.2 Minimum weight is 950 grams, ready to race including lap-counting transponder at all times during the race/heat/final.

1.3 Wheel rim diameter maximum is 40mm, and 26mm Width. Only commercially available wheels may be used. No modifications or changes to the original manufacturer's design and dimensions are allowed.

1.4 The tyres must be black except for side wall detail.

1.5 Tyre treatments are permitted at the organiser's discretion and are the user's responsibility. Organisers who ban use of specific products should state on the entry forms. Flammable and toxic substances are not recommended. The BRCA has not yet found a substance that it can recommend for the treatment/cleaning of tyres. The BRCA draw organiser's attention to the possible hazard created by large numbers of competitors using tyre treatments in a confined space. The BRCA recommend that the competitor adheres to the methods of usage as stated by the supplier of the treatment. A list of additives will be published prior to start of each season. New additives may be added during the season, subject to approval by the BRCA 12th section committee.

1.6 Tyres must have a minimum width of 20mm and a maximum width of 26mm.

1.7 Wheel nuts and/or axles must not protrude more than 2.0mm beyond the outer edge of the wheels. No more than 1.5mm of wheel outer side may be exposed (not covered with rubber) on the outer edge of wheels.

1.8 Bumpers may be fitted but must be designed to minimise injury that could result from being hit by a car, also to reduce the risk of damage to other cars. Rigid bumpers made from non-resilient materials such as metal are not allowed. Other sheet materials should have an edge radius not less than 1.5mm.

1.9 Only one wing is allowed on the car, maximum dimensions to be, width 165mm, chord 50mm, unless the original car had more than one wing. The second wing must be to scale within 10% in size and location.

1.10 Overall maximum width of the rolling chassis to be 165mm including wheel nuts and axles, not including bodyshell. Wheelbase is to be 196mm minimum to 208mm maximum.

1.11 All cars must have clear windscreens, unless the actual car did not have clear windscreens.

1.12 Side and/or rear windows, if any, must be clear.

1.13 All cars to have clearly visible identifying numbers to the Race Directors satisfaction.

1.14 Numbers must be at least 25mm high with minimum stroke of 4mm. They must be black numerals on a white background.

1.15 No portion of the chassis or any equipment may extend beyond the body, except aerial masts, rear diffuser (if fitted) and up to four posts for the purpose of mounting the body shell.

1.16 Flexible masts/tubes only may be used.

1.17 Openings in the body other than ones appropriate to full size cars shall be kept to a mini- mum.

1.18 Wheel cut-outs may not be more than 10mm larger than the tyre radius. Exception- scale size and/or shape wheel well cut-outs. Wheel wells must be cut out if the original cars are cut out.

1.19 When initially entered in a meeting the body shell must be neatly finished and complete

1.20 Body and chassis must be securely joined at all times while the car is on the track.

1.21 Body shells must be listed in Appendix 1 to these Rules to be eligible for use in BRCA GT12 Nationals. Body shells must be approved by the Committee, a list of approved shells will be available on the BRCA website. Body shells when painted must have a minimum of headlights, front grill and rear lights picked out in a realistic colour, size and shape that clearly separate them from the other body colours. Additional grills and intakes picked out in the same way are preferred. Windows will be clear, may not be cut out, and will be shaped as per the original car. Bodies must not be cut above the lower cut lines marked on the body shell. If there is a diffuser cut line, the bodyshell may be cut to this line.

1.22 Only one drive motor is allowed per car.

1.23 The minimum ground clearance of the car, not including the spur gear, is 3mm; minimum 1mm under the spur gear; this will be checked during scrutineering for each qualifying heat and final race.

1.24 Only Personal Transponders will be used to record laps at BRCA sanctioned events and Nationals.

2. DEFINITION OF BRUSHLESS MOTOR

2.1 13.5T brushless - Any motor listed in any of the Electric Board Homologation List for Brushless Spec Motors (13.5T) as updated from time to time.

2.2 17.5T brushless - Any motor listed in any of the Electric Board Homologation List for Brushless Spec Motors (17.5T) as updated from time to time.

3. DEFINITION OF A ZERO-TIMING SPEED CONTROLLER

3.1 Speed controllers may not be equipped with any form of automatic or programmable timing advance. If this feature is available on the particular speed controller it must be disabled and placed in an approved mode - i.e. the "ROAR blinking LEDs mode." Only Speed controllers from the BRCA Approved Blinky ESC's list may be used.

3.2 Reverse function must not be used in GT12-class cars at Nationals.

4. BATTERIES ALLOWED

4.1 Any Batteries conforming to the current Electric Board 1S Stick and Saddle LiPo battery list as updated from time to time. All Batteries used in any competitions MUST be hard-cased. Soft cases or no cases are not allowed.

4.2 Cars with 13.5T or 17.5T Brushless Motors will be powered by cell/s with a maximum nominal voltage of 3.8V.

5. CHASSIS AND COMPONENTS

5.1 The chassis component will consist of one continuous sheet of material that extends from a minimum 10mm ahead of the front axle line and runs continuously along the car to end 25mm minimum behind the rear axle line. The chassis may not include any features designed to allow the front and rear axle to rotate along the central axis of the car relative to each other. (Intent – that the chassis supports all the suspension components and is sufficiently rigid not to be used as a working part of the suspension system/s).

5.2 Front Suspension, Chassis shape and hole pattern to be homologated, Manufacturers may submit a maximum of 3 designs per 12 month period. Legal chassis' listed in Appendix 2. Legal front suspension designs listed in Appendix 3. - No modifications to chassis - Design may be offered in a "alloy" or "composite" version - Edges may be smoothed / sanded / sealed - Chassis and Front Suspension components must be commercially available

5.3 Metals used in the production rolling chassis and any aftermarket parts may only be brass,steel or aluminium with the exception of the GT12 SuperCup class where, solely for the use as turnbuckles, titanium will be allowed. Brass, lead, and steel may be used as weights.

5.4 All suspension systems must operate independently of the chassis component.

5.5 Separate dampers are only allowed on the rear suspension. Dampers requiring seals to prevent the egress of any type of damping medium are not allowed. (Intent – that dampers are non-sealed 'straw' or 'tube' style. Dampers with any type of damping medium contained in a sealed reservoir are not permitted).

5.6 Dynamic Camber is not allowed. (Intent – that suspension systems from Touring Cars, GT10 cars, 12th cars and F1 cars featuring pivoting suspension arms are not used).

5.7 The rear axle must not have any articulated element and may be fitted with a differential

5.8 Only a single fixed speed transmission is allowed.

5.9 Gears in the single fixed speed transmission must be 32DP or 48DP only.

5.10 Rolling element (ball) bearings are allowed on the front and rear axles.

5.11 Cars may only have two driven wheels with the drive to the rear axle.

THE FOLLOWING APPENDICES ARE PART OF THE RULES ABOVE

APPENDIX 1 – BODY SHELLS

Only GT body shells are allowed. At the time of submission for homologation, the full-sized car upon which the body shell is based must be currently FIA homologated (for GT Competition) and have been raced within the previous 3 years. All shells must be a reasonable representation of the full-sized car as judged by the GT Section Committee. The final decision on including bodies in the approved list rests with the GT Section Committee. Manufacturers are recommended to contact the 1/12 Section GT12 Representative to confirm if any specific car is permitted. (Intent – that LMP cars and those designed specifically for racing are not allowed). As part of the homologation process, the manufacturer's part number must be clearly marked in the lower corner of the windscreen area.

The following is the list of approved bodies for the GT12 class:

KAMTEC

Kamtec Lotus GT1 (Kamtec part no. GT01)
Kamtec Ascari GT3 (Kamtec part no. GT02)
Kamtec Aston Martin (Kamtec part no. GT03)
Kamtec Type F (Kamtec part no. GT04)
Kamtec Porsche GT3 (Kamtec part no. GT05)

MARDAVE

Mardave Lotus GT1 (Mardave part no. V140)
Mardave Ascari GT3 (Mardave part no. V151)
Mardave Aston Martin (Mardave part no. V160)
Mardave GT2 (Mardave part no. V131)
Mardave Porsche (Mardave part no. V113)
Mardave Ginetta (Mardave part no. V161)

PENGUIN CUSTOM BODYSHELLS

Lambo GT12 (part number PEN01)

PROTOFORM

Protoform PF-M12 (Protoform part no. #1613-30)

SCREWZ4RC

Audi R8 (part number G903)

ZEN-RACING

Zen-Racing GTM (part number PBGT02)
Zen-Racing GTF (part number PBGT03)

MONTECH

Montech MLGT3 (part number MT018001)
Montech LTS-GT (part number MT018012 & MT018012L)
Montech Italia (part number MT019015 & MT019015L)

BITTY DESIGN

Bitty Design LS3 (part number BDGT12-LS3)
Bitty Design AGT (part number BDGT12-AGT)
Bitty Design Seven20 (part number BDGT12-720)

The following link contains info on the current FIA GT homologated lists. Only cars listed in the GT3 class are eligible.
www.fia.com/homologations - Use "list of Homologated Vehicles classified by number".

APPENDIX 2 – HOMOLOGATED CHASSIS

The following is the list of approved Chassis' for the GT12 class.

SCHUMACHER

U3981 SupaStox Chassis 6 Cell/2s Saddle
U3957 SupaStox Chassis 4 Cell/1s/Shorty
U4649 SS GT - S1 Chassis
U4623 SS GT - C/F Chassis
U4816 Atom - Alloy Chassis
U7276 Atom CC - C/F Chassis U7878 – Atom 2 - Steel Chassis
U8033 – Atom 2 – Carbon Chassis

ZEN-RACING

ZENC101 RSGT12 Main Chassis
ZENC106 RSGT12 Twill Carbon
ZENA100 RXGT12 Aluminium Chassis
ZENC150 RXGT12 Carbon Chassis

MARDAVE

MARCE-01 Mardave CE
MARCEC-01 Mardave CEC
MARAC-12 Mardave AC12
MARA-001 Assassin
MARGT-001 Assassin GT
MARVEN-001 Venom
MARVGT-001 Venom GT - Carbon Chassis
MARVCC-001 Venom CC - Alloy Chassis

ORE RACING

R318 ORE TwelveGT Carbon
R653 ORE B2B Carbon
R722 ORE B2B-W17 Alloy

APPENDIX 3 – HOMOLOGATED FRONT SUSPENSION

The following is the list of approved Front Suspensions for the GT12 class. Where available as a single part number, this is given. Otherwise, the suspension described is that fitted as standard in the Kit for each car, and the Car Kit part number is given where available. Changes to the suspension using spacers/shims to control camber, caster or ride height are permissible.

SCHUMACHER

Supastox Supastox Long Wheel Base K157
Supastox GT
K164 Atom Pro K173 Atom CC
U7280 (+U4866) Atom Low Profile Front End (built with posts and camber strap)
K179 Atom2 (S2) K184 Atom2 (Carbon)

ZEN-RACING

ZENP309 GT12 Front End (Including Camber/ Caster variations ZENP301, 302)
ZENK103 GT12 Adjustable GT12 Front End
OPT-120 RXGT12 'NOS' GT12 Front End (with all camber/caster inserts)

MARDAVE

MARCE-01 Mardave CE
MARCEC-01 Mardave CEC
MARAC-12 Mardave AC12
MARA-001 Assassin
MARGT-001 Assassin GT
MARVEN-001 Venom
MARVGT-001 Venom GT
MARVCC-001 Venom CC

ORE RACING

ORE TwelveGT Carbon
ORE B2B Carbon
ORE B2B-W17 Alloy

V1.0 JG - Amended from EGM 2014 (21 May 2014)
V1.1 MS - Shell List Updated (21 May 2014)
V1.2 MS - Incorrect Blinky Diagram Removed (22 May 2014)
V1.3 JG - Audi Shell Added (01 June 2014)
V1.4 PL - Lambo GT12 bodyshell added (23rd Jan 2015)
V1.5 DG - Updates from 2015 EGM (1 Sept 2015)
V1.6 DG - Changed Appendix 1 to state GT Section committee instead of 1/12th Section Committee (22 Sept 2015)
V1.7 MS – Re-formatted as construction rules only (24 Sept 2015)
V1.8 DG - Porsche GT3 Bodyshell added (23 Jan 2016)
V2.0 DG - Changes made after 2016 EGM (24/05/2016)
V2.1 DG - GTM Bodyshell added (19/01/2017) v3.0 DG - Changes made after 2017 EGM (1/11/2017)
V3.1 NC - GTF Bodyshell added (19/02/2018) v3.2 NC - Changes made after 2018 EGM (27/08/18)
V3.3 NC - MLGT3 bodyshell added (01/09/18)
V3.4 LO - LS3 bodyshell added (16/10/18)
V3.5 LO - LTS-GT bodyshell added (05/11/18)
V3.6 MRC - Updated introduction (no rule changes)
V3.7 MRC - Updated following 2019 GT AGM, BDGT12-AGT added (21/05/2019)
V3.8 MRC – Updated adding in Front End List v3.9 MRC – Italia bodyshell added (11/10/2019)
V4.0 MRC – Atom2 Carbon Chassis added (21/03/2020)
V4.1 MRC – BittyDesign Seven20 bodyshell added (11/06/2020)

NOTES

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