

HOW TO GO RC CIRCUIT RACING

A beginners guide to starting racing

Never been RC Racing before? We've got you covered!

Here is a very useful guide originally written by Aldershot Model Car Club on 'How to go racing'. This covers a lot of the things you need to know before embarking on your first race. We look at the basic questions, how you join the BRCA and enter a race, what you need and what to expect on a race day. This guide uses the best selling entry level Tamiya TA-02 kit as an example, although much of the information will be useful for any model and class of car being driven.

Useful checklist

Use this to make sure you have everything you need.

- ☐ RC car kit
- ☐ Radio Gear
- ☐ Electronics
- ☐ Batteries
- ☐ Battery charger
- ☐ Tyres
- ☐ Timing transponder
- ☐ Tools
- ☐ Tyres (Possibly dry and wet tyres)
- ☐ BRCA membership
- ☐ Race entry
- ☐ Hi Viz Vest or Jacket
- ☐ Heavy duty gloves
- ☐ Read the rules
- ☐ Read driver's briefing and heat lists / attend the briefing

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The basic questions

RC racing. What's that all about then?

The excitement of remotely controlling electric racing cars has captivated enthusiasts for many years. And interest is only growing now, as young and old alike look to get outdoors in an interactive, safe, fun way. Running RC cars around the local park may be great fun, but the challenge provided by organised racing adds a new dimension and offers the chance to meet lots of people who share your interest.

Radio Control car racing is a hobby that develops life and STEM (Science, Technology, Engineering, Mathematics) skills in an engaging manner

Model car racing is also fully inclusive. Any age can take part, and as long as you can hold a controller and see your car on the track, you will be able to take part.

Multiple F1 Champion Lewis Hamilton began his journey racing RC cars as a child as did many other top racing drivers. Why not let it begin your journey now?

The most important thing of all though is you must **HAVE FUN!!**

Is RC racing expensive? And what do I need?

RC racing can be expensive! With racers spending hundreds of pounds on chassis kits, before you even count the controllers, batteries, motors, body shells, tools and everything else!

However, you can start on a budget with beginner classes available, allowing a **lower cost entry** to bring new blood into the sport.

Most hobbies cost money. And the budget is up to the individual. But to give you an realistic idea, entering a beginner class with a budget entry kit, like a Tamiya TT-02, will be approximately like this:

- ☐ Tamiya TT-02 Kit - £125
- ☐ Paint - £5
- ☐ Radio control gear - £35
- ☐ Electronics Speed Controller (ESC)- £20 (might be included in kit already)
- ☐ Steering servo- £20
- ☐ Tune up parts* - £45
- ☐ Lithium Polymer 2S Battery (LiPo) - £30
- ☐ Battery charger - £35
- ☐ Battery safety bag - £5
- ☐ Tools - £15
- ☐ Tyres (1 set will last a season) - £25
- ☐ Timing transponder - £50
- ☐ BRCA Membership (2021 price) - £20 p.a.
- ☐ Club membership* (varies) - around £20 p.a.

*recommended, but not essential

So all in you are looking at **around £350 - £400 all in to get started**. Then you need to budget for race fees, some spares and travel.

For the more advanced touring cars, kits start from around £300 for a chassis, and then you would need to add a motor (£50-£100) and speed controller (£35-£150). These cars offer even more tuning options and adjustment and are the very same used by national and world champions. If you need advice on which first car to buy, please ask any of us at the club.

Club loan car for juniors

A club loan car is available if you want to give the sport a try before committing yourself to buying all the kit. For more information visit our website. Search for "loan car" for more details and to book our car!

A bit more about the Tamiya TT-02 kit

Tamiya Incorporated is a Japanese manufacturer of plastic model kits, radio controlled cars, battery and solar powered educational models, sailboat models, acrylic and enamel model paints and various modeling tools and supplies. The company was founded by Yoshio Tamiya in Shizuoka, Japan, in 1946.

Their first radio-controlled car was released in 1976. Their models are based around the concept of being, "easy to understand and build, even for beginners".

The company has gained a reputation among hobbyists of producing models of outstanding quality and accurate scale detail. Its philosophy is reflected directly in the company's motto, "First in Quality Around the World".

The TT-02 has become a very popular entry-level chassis, especially for drifting, racing and rallying applications. It's versatile design, with a lightweight plastic bathtub chassis, along with the central driveshaft give it the strength and adaptability to mean it is a great car for the beginner RC enthusiast, whilst still providing the experienced enthusiast with a thrill.

Whilst it is entirely possible to simply race the basic TT-02 kits straight out of the box, there are some choice modifications, which serve to increase durability further, improve driveability and increase the speed.

Building the kit

There are 3 key components to building a Tamiya or any other model race car, just the same as building a full scale race car!

There's the mechanical assembly and tuning, the body shell, and the electronics.

The mechanical assembly and tuning (3 - 6 hours)

All model car kits come with comprehensive build manuals, which guide the builder step by step through the entire process. The kits are no more complicated to assemble than a Lego kit. Everything needed is included in the kit, apart from some simple tools; a craft/sharp knife, scissors, pliers, a cross head screwdriver and some snips. Hop Ups are sold separately by brands and you need to check the rules for your local club or the race series you plan to enter before blowing a load of money on things you won't be allowed.

The body shell (1 - 2 hours)

Made of clear plastic and is supplied exactly as it comes out of the mould, so it's up to the builder to trim the bottom of the shell and cut the wheel arches out. The paint is applied to the inside of the shell, with adhesive decals fitted to the outside for detailing. The special paints are readily available and relatively easy to apply.

Electronics (1 hour)

There are 4 major components to the car's electronics. The Electronic Speed Controller (ESC), The controller/radio gear, the motor and the steering servo. Fitting these is mostly a case of plug and play. If you can wire a plug, then this is just as simple.

LiPo batteries and a charger

Batteries come in several flavours; Lithium Polymer (LiPo), Nickel Metal Hydride (NiMH) and Nickel Cadmium (NiCd).

Batteries also come in different cell capacities. Think of each cell as an individual battery itself, and then the pack is a number of these cells linked together in series to make one big battery pack.

For budget entry classes, the batteries will need to be either 2-cell (referred to as 2S) LiPo, or 6-cell NiMH or NiCd. These batteries all have a nominal voltage of 7.8 volts, but when fully charged they hold around 8.4V. **The maximum voltage that standard LiPo batteries can be charged to is 8.4V**

LiPo batteries are the best bet, although slightly more expensive. These give maximum power for longer, are lighter and can be charged quickly.

LiPo batteries have their disadvantages; they must be stored and **MUST be charged in a LiPo safe bag** as they can catch fire if faulty or mis-treated. They must also not be left discharged or fully charged or they will swell.

For a more in depth battery guides look here:

<https://www.rcgeeks.co.uk/blogs/news/complete-remote-control-car-battery-guide-overview>

https://www.rccaraction.com/everything-need-know-rc-batteries/#visitor_pref_pop

You will find that most racers will have at least two batteries. This allows one battery to be used, whilst the other battery is being charged.

So, you have batteries, now you need a charger. First and foremost, make certain that you get a NiMH charger if you have NiMH batteries, and a LiPo charger if you have LiPo batteries. Some chargers can do either. There are as many chargers out there, as there are batteries. A decent charger can be had for around £35-40.

The SkyRC iMAX B6AC V2 Charger is a good choice as a start (beware of cheap copies though).

You also need to supply your charger with power. The options are:

- 12v leisure battery or heavy duty car battery (these can be bought from around £40)
- petrol generator with inverter (more expensive and noisy!)
- charge from your 12v car battery (just don't run it flat!)

Another alternative is to take 5 batteries fully charged for the day – this will give you enough for the common race format of three qualifying rounds and one final, plus you'll have a spare for practice. However, this can work out more expensive than just equipping yourself to recharge trackside.

Personal Transponder

A personal (or timing) transponder is a tiny transmitter that plugs into a servo port on your receiver. So, you'll need to ensure your receiver has the extra channel slot; a three or four channel receiver is ideal.

With a transponder fitted, your car will register each lap as it passes over the 'loop' at the race track. The loop is a section on the track with a small wire running under or over it that receives the car's transponder signal as it passes. Race timing software on a computer in the timing hut will log those laps to your transponder.

Here at Adur Model Car Club all our circuits use www.rc-results.com to show your lap times and race results, plus heat lists in REAL TIME. You can also look back over past results to see how you are improving.

For a personal transponder that works with our system we recommend the MRT transponder made right here in the UK. A Google for MRT Transponders will show where you can buy these either online, ebay or directly from MRT. Essentially although there looks like lots of options, you can either have a transponder with an allocated code chosen for you (YES for your first transponder) or a custom option if you have more than one car and want the same transponder number. There is also an option to buy a stripped back version, or a cased version. Personally most of us used the cased option for extra protection

Joining the BRCA and Your Local Club

British Radio Car Association (BRCA) membership

To race, you will need to become a member of the BRCA eventually. You will be able to do your first few meetings without needing to join up, but after that all clubs require you to become a member of the BRCA. RC car racing is regulated, organised and promoted at a national level by the British Radio Car Association (BRCA). The BRCA is also affiliated with the Motorsport Association UK, a non-profit organisation who oversee all forms of motorsport from RC cars, Kart racing, all the way up to Formula One and were founding members of the FIA.

One of the main benefits is that **BRCA membership includes insurance** that covers you if someone gets hurt whilst you are driving. This insurance not only covers you at the race track, but also at any other time, like bashing cars around in the local park for instance.

Sign up is easily done online, takes a few minutes and can be done at <https://www.brca.org/join>

Race entries

Race entries are simple to do and are completed online through the clubs' website.

Club membership

Joining a club is not a requirement for racing, but it can certainly help in many ways.

To join you will need to pay an annual fee, details of which are on the club website. However, doing so would bring a lot of benefits.

A benefit that not all clubs can offer is that membership at Adur allows you access to the road circuit 7 days a week. Great for practicing driving or trying out new set ups! Other members will be able to help with advice on kit and tips on building and driving the cars. Being a member also gives you the opportunity to enter club races at a discount to get a good amount of practice at the local track. And along the way it offers the opportunity to make some friends who will be only happy to help you along.

What else do I need to know?

Tools and spares

The car kits are pretty tough, and unlike off road racers, the enclosed tough body shells protect the components in a lot of the impacts. However, when you are starting out you will probably break a few things in crashes on the track. Even the more experienced make mistakes and need to make trackside repairs from time to time!

The items most likely to get damaged or lost are front wishbones/arms, front hubs, and in a big impact front shock towers. You will also typically lose the little driveshafts in the event any of these parts get broken.

Tools needed to begin with don't extend much beyond what was needed to build the kit in the first place. The best advice here is to get the best quality you can afford. Good tools are easier to use, less likely to cause damage to the car components, put less strain on your hands and last longer.

Later on, you may want to invest in more specialised tools, such as ride height gauges and measuring tools to aid in set up. But these are not totally necessary for a beginner.

A tool box is also a good idea. A simple £15-20 plastic tool box from a DIY shop will do to begin. As your tool and equipment list grows, you may find you want to invest in a bigger 'pit box' or 'hauler' to store your racing gear such as tools and spares. Ideally, you will want one with wheels, especially if you are racing at tracks where the car park is some distance from the pitting area.

Safety equipment

Even though the cars are small, they can still cause some harm with the wheels spinning, flying along at 25 - 30 mph! High viz jackets are a must when marshalling. It is also sensible to wear strong footwear that will protect the feet in the event a car hits you and strong gloves (eg gardening gloves) when performing marshalling duties.

Food & facilities

Adur road circuit races are all held on an outdoor, purpose built, asphalt race track. So, ensure that you dress for the weather expected that day. There are no sheltered pit areas, so a gazebo or similar is a great idea to shelter you from the weather. To begin with, it should be possible for the club to provide you with some help here - either by sharing a pit area with another member or by providing a club awning if the numbers of new people warrant it. Just get in touch beforehand and we will assist.

Although some circuits have power available, most do not. We have no power on site so you will need to be self-sufficient charging batteries and powering tyre warmers if you have invested in some. If buying a generator please buy a loooong extension lead, so that the generator can be placed away from the main pit area to make the area a little quieter!

Adur currently has no onsite food or drink facilities, so please bring everything you think you might need in this regards

We do have basic onsite WC facilities.

What happens on a race day

Drivers briefing

Prior to larger events, a driver's briefing document will be distributed to all registered entrants. This will contain all the important information you need to know about the meeting. **Please read this carefully! Many times people have tripped themselves up by not reading the briefing properly.** For regular club events, the briefing will take place in person in the pit area prior to racing.

Heat listings

Prior to the event, heat listings will be published, usually on the Facebook page or on the website. These will show the order of the races, as well as the qualifying heat your car is in and the order that the cars will set off in.

Arriving at the race meeting

A Typical daytime race meeting will begin with the gates to the track opening at 8:30am. It's best to arrive for then, so you can get unpacked, set up and ready to race. Qualifying races usually start at around 9:45am.

So once you arrive at the track, unload your racing gear into the pit area, get your charger set up and batteries on charge (unless of course you have charged them the night before) and get the final fettling done to the car, so you're all ready to race.

Marshalling

Races to be marshalled. Racing wouldn't be much fun if you all had to keep leaving the rostrum (racing stand) to go and flip your car back over after a crash; that's why we have marshalls.

Most clubs don't have the budget for employing a bunch of marshalls to turn flipped cars the right way up. So **all racers are usually expected to marshall the next (or previous) race after their own.**

Safe marshall points are numbered around the track, and marshalls are usually the only people permitted on track while racing takes place. Your race number determines where you need to stand. Sometimes you may need to move to provide additional cover.

- ☐ You **MUST** marshall the heat after your race. (you can nominate a suitable substitute, but you must inform race control).

You must marshall or provide a suitable substitute marshall.

- ☐ Marshalls should wear strong footwear and must wear a Hi Viz jacket or vest and tough gloves.
- ☐ Pay attention to the race in your zone or area when marshalling.
- ☐ Don't be tempted to watch the leader all the way, as you will lose sight of your zone and miss any crashes that are close by
- ☐ Don't play with your phone! When you are marshalling **REMEMBER** that that is your **JOB**. Marshall the driver's cars as **YOU** would like to be marshalled.
- ☐ Get to the cars quickly, but safely. Keep an eye out for other drivers coming along your section and wait, if you have to, for them to pass.
- ☐ Always place the car back on the track in a safe position near to where it came off. Place it to the outside edge of the track, away from the racing line.
- ☐ Marshall how you would like to be marshalled!

Race format: heats and finals

A typical race meeting might consist of 4 qualifying rounds and two finals, but this all depends on the event and can be any number. This will all be included in the pre-race briefing. **All heats and finals last for 5 minutes** plus one lap of the leader.

Heats or qualifiers

Heats, otherwise known as Qualifiers, are the way of sorting drivers starting positions for the Finals. Your qualifying position at the end will determine your starting position on the grid in the Finals.

You are racing against the clock, not other drivers, in qualifiers. The idea is to complete as many laps as you can in the best time. If you end up being Top Qualifier (TQ) – not likely for a beginner – you will start the finals in pole position, which is a great advantage.

All competitors place their car on the track and line up across the start line. Then the competitors car numbers, as numbered on the heat listings, are called one-by-one, with a

gap of one second, so you are all going around the track spaced apart (although not for long – slower drivers will inevitably drop back and the experienced drivers will catch up and overtake).

It is courteous to let any faster, lapping cars pass, and, hopefully, drivers you are lapping will do the same.

If there was only one qualifying round, then racers would be sorted by whoever completed the highest number of laps in the least time.

With multiple qualifying rounds, things get a little more complicated. Results can be calculated based on the FTQ or Round by Round Methods.

Finals

The finals are pretty straight forward. First across the line wins!

Line your car up on the grid on the correct grid number position. Your position will be shown on the results sheets produced after the qualifying heats have all finished.

When there are too many drivers to fit into one Final for the class, they are broken up into groups (typically consisting of 6-10 drivers in each). So you'll have an A Final for the fastest 10 qualifiers, a B Final, a C Final etc

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You can also have multiple Finals – Leg 1, Leg 2 etc. The results of each one are added together, just like Round by Round Qualifying. Times are used when there is a draw.