



## RADIO CONTROLLED CAR RACING 101

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## **Introduction**

Welcome to the wonderful world of Radio Controlled Model Car Racing, just by opening this document you have taken your first steps into discovering the most family friendly and age independent competitive sport there is. But what is RC racing and why would it be an awesome activity for you and your kids?

Well, this document will aim to provide all the information you could possibly need to get started along with a little bit of background detail to help you get to grips with a sport which has a huge worldwide following and has been around since the late 1970's but still, 35 years on, remains relatively unknown.

Don't worry too much about reading the whole thing; the idea here is to have a reference guide as to the terminology and general workings of the sport.

So, let's begin!

## What is RC Racing?

RC Racing, as we will discuss it herein, is based on 1/10 scale off road electric vehicles. Racing is generally categorized by the racing surface, number of powered wheels and the vehicle type. The popular classes in Australia are as follows:

- Two wheel drive (2wd) – electric off road buggy
- Four wheel drive (4wd) – electric off road buggy
- Stadium Truck (2wd) – electric off road
- Short course truck (2wd) – electric off road

But what does this mean? Below are images of popular vehicles in each category:

Model	Category	Image
Team Associated RC10 B5	Two wheel drive (2wd) off road buggy	
Team Associated B44.3	Four wheel drive (4wd) off road buggy	
Team Associated T4.2	Stadium Truck (2wd)	
Team Associated SC10.2	Short course truck (2wd)	

## RC Racing – A brief history

The first commercially viable Radio Controlled Cars appeared in Europe in the 1960's, however, it wasn't until the introduction of high-capacity rechargeable Ni-Cad batteries in the late 1970's that racing as we know it today began to take shape.

Around the same time Japanese firm Tamiya released the first true, mass market, electric off-road RC vehicles with their Sand Scorcher and Rough Rider models. Based on full scale dune racers of the period, their popularity was such that Tamiya can be credited with instigating a boom that lasted well into the late 1980s, and provided the basis for today's radio controlled car market.

RC off road buggy racing already existed at this time, but the cars were crude, flimsy, and didn't handle well at all. Most cars needed extensive modifications just to make them last for a few minutes.

In 1982, KO PROPO of Japan introduced the Expert EX-1, and they are credited as being the first company to create a dedicated radio control system for RC car racing. Instead of using joystick type controls as had been the norm to date, since most racers used equipment designed for flying RC aircraft, the Expert EX-1 transmitter integrated a pistol grip and trigger to act as the throttle alongside a steering wheel assembly. The "Wheel" radio has since become a popular fixture in radio controlled transmitters.



Figure 2 - Tamiya Rough Rider - 1979



Figure 1 - Gil Losi Jr (L) and Jay Halsey - 1985

Then in 1984 Associated Electrics in the U.S released the RC10 and changed everything. The new car was, unlike its Japanese counterparts of the time, a serious off road racing machine, manufactured from anodised, aircraft-grade aluminium alloy. The shock absorbers were machined, oil-filled and completely tunable; they were also produced from the same aluminium alloy. Suspension control arms were manufactured from high-impact nylon, as were the three-piece wheels. The RC10 quickly became the dominant force in electric off-road racing and, possibly more than any vehicle before or since made the single biggest impact on the sport.

1985 saw the very first IFMAR Off Road Electric World Championships held at the, now legendary, Ranch Pit Shop RC Raceway in Del Mar, California and the American, Jay Halsey ran away with the 2nd title to become the first ever World Champion with his Associated RC10. Winning the 1/10 scale 2wd off road worlds remains as one of the highest standards an RC racer can achieve. Gil Losi Jr would take home the inaugural 4wd crown running a Yokomo YZ-834B.

Losi Jr, alongside his father, Gil Losi Sr, would go on to form Team Losi and become huge figures in the RC world, contributing some of the most significant and innovative vehicle design ideas that the sport has ever seen.

Electronic speed controllers would make their first competitive appearance at the 1985 Off-Road Worlds, with both championship winning cars using the Novak NESC-1.

One of the most important partnerships in the history of the sport began at around the same time when electrical engineer and avid RC racer Mike Reedy joined Associated Electronics (which would later become Team Associated as we know it today). Reedy's development of Yokomo-based motors and matched battery packs led to their complete dominance of electric racing through-out the 1980's and 90's. Drivers running Reedy-powered cars are credited with 29 IFMAR World Championships to date, the most of any RC motor manufacturer



Figure 3 - Losi Double X - 1994

The modern era of competition RC cars was really instigated with the 1994 release of the Team Losi Double-X 2wd buggy. Many cars available at the time used either a pressed aluminium or plate fibre-glass chassis with relatively short control arms. The Double-X came along with a development of Losi's previous moulded plastic chassis cars, much longer control arms and a modular rear

gearbox/suspension arrangement. Matt Francis would win the 1995 IFMAR World Title using the Associated RC10-B2 prototype, a buggy that is very Double-X-like in design (plastic chassis, long suspension control arms, modular rear end, etc). A Double-X went on to

take the world title in 1997 in the hands of Brian Kinwald and the car would set the standard for more-or-less every design released over the following 15 years.

Much would change in those intervening years, the introduction of brushless motors and Lithium-Polymer (Li-Po) batteries has greatly increased speed and run times whilst huge leaps have been made in terms of tyre compounds and tread patterns. But the basic structure of the vehicles has remained largely the same and often goes in fashion cycles. In 2014, the majority of 1/10 off road competition vehicles on the market comes with an aluminium chassis as standard, just like back in 1985.

And just like in 1985, the pioneers of the sport prevail today with names like Team Associated, Team Losi, Yokomo, Reedy, KO PROPO and Novak still producing some of the finest racing equipment money can buy.

## **Why is RC Racing awesome for me and my kids?**

Well aside from being involved in real competition with real people, the sport teaches hand eye co-ordination, basic mechanical and electrical skills, dealing with pressure, fair play, and above all patience! It is also completely safe, relatively cost effective (it is quite a long way from cheap), a great father/mother/son/daughter bonding activity and it gets you outdoors!

## **How old do I need to be to play?**

10 years old is realistically the minimum age for taking part in a race meeting. That being said there are kids who come down to race at a younger age but they are generally the offspring of experienced racers. This means that they (the parent) understand how everything works, know almost everyone and are comfortable in their surroundings. If both parent and child are starting afresh in the sport then it might become stressful for both parties as things will (inevitably) go wrong and the reasons won't always be immediately apparent.

If you do intend to introduce a very young child to RC racing then the best advice would be to attend race meetings for a good few months and have a go yourself before bringing the little man or woman. In this way you can get your head around how a meeting works, get things wrong, break things and generally make mistakes (and you will) and the only one that might get upset is you.

Once you have the hang of things, then bring the young'uns down to have a go. There will always be plenty of other small people running around and they will more than likely make friends very quickly. If you (the parent) have done the appropriate ground work then the actual racing will be an added bonus for your

young person alongside meeting all those cool new people.

## **Where can I go for advice?**

Your local RC car racing club is always the best place to start. In the main, RC racers are laid back groovy people who love talking about their sport, they are also extremely knowledgeable, so don't be afraid to wander up and ask questions, just remember to take a pen and paper because there will be too much information to keep in your head.

The next stop would be your local model shop. Otherwise the forums on RcTech.net are a wealth of information, some of it useful, some of it not. Google the club name followed by RcTech (for example "Keilor RcTech") and the link will come up, they are all on there.

## **What car should I buy?**

You can start with a buggy, a stadium truck or a short course truck; you aren't likely to go wrong with any of them. Here are the major factors to take into consideration:

- Choose a class that's popular with local racers. If nobody races buggies, don't pick a buggy, because you won't have anybody to race with.
- Choose something which appeals to you. Watch a race and decide for yourself what looks most exciting.
- Ask around and find out which is the most popular vehicle manufacturer at your local club. This is important for two reasons, the first is that most people who have been racing for a while carry a lot of spares and as a beginner you are going to break things – fact. Secondly there will be more people to ask for advice regarding set-up, gearing, tyres etc.

- Trucks are a little easier to drive. That's because with their greater weight and larger tires, they are more stable and react a little more slowly in the turns. Their handling is a better match to normal human reaction times. Trucks are a little slower around most courses, but are actually faster on some tracks.
- Trucks work a lot better than buggies on grass. Grass fields are a convenient place to learn driving before you start to race and also a great place to practice between races.

Short course trucks are very popular in Australia at the moment, and more and more newcomers are starting with them, however 2wd buggy remains the largest class in terms of driver turn out.

4wd is something to get into when you are more experienced. The cars are very different mechanically and take much more effort to look after. When you feel you have got the hang of 2wd and are looking for a new challenge, then have a go at 4wd.

So what are the choices? The table below aims to set out the current and most recent models from the popular RC brands and is in no particular order:

Brand	Model Name	Status	Class	Model Number
Team Associated	RC10 B5	Current model	2wd	90001
	B44.3	Current model	4wd	9063
	RC10 T4.2	Current model	Stadium Truck	7025
	SC10.2	Current model	Short Course Truck (2wd)	7038
	RC10 B4.2	Most recent model	2wd	
	B44.2	Most recent model	4wd	9062
	RC10 T4.1	Most recent model	Stadium Truck	7023
TLR (Team Losi)	22	Current model	2wd	TLR0022
	22T	Current model	Stadium Truck	TLR0023
	22SCT	Current model	Short Course Truck (2wd)	TLR03003
	22-4	Current model	4wd	TLR03005
	XXX-CR	Most recent model	2wd	LOSA0032
	XXX-T	Most recent model	Stadium Truck	

<b>Brand</b>	<b>Model Name</b>	<b>Status</b>	<b>Class</b>	<b>Model Number</b>
TLR (Team Losi)	XXX-SCT	Most recent model	Short Course Truck (2wd)	LOSB0106
Kyosho	RB6	Current model	2wd	KYO30068B
	ZX6	Current model	4wd	KYO30046
	SC6	Current model	Short Course Truck (2wd)	KYO30070
	RB5 SP2	Most recent model	2wd	KYO30066
	ZX5 FS2 SP	Most recent model	4wd	KYO30045
	SC-R	Most recent model	Short Course Truck (2wd)	KYO30850
Traxxas	Slash	Current model	Short Course Truck (2wd)	58034
HPI	Blitz Flux	Current model	Short Course Truck (2wd)	109326
	Blitz	Most recent model	Short Course Truck (2wd)	105832

## Toy cars Vs Racing cars

Many online retailers and nationwide chains sell Radio Controlled Cars. For the most part they can be classified as toys and the difference is not always readily apparent.

Here are things to look out for:

- If it comes from Target, Kmart, Big W or the like then it is definitely a toy
- If it costs less than \$150 (new) then it is definitely a toy
- If it is modeled on a popular SUV then it is probably a toy
- If the scale is smaller than 1/10 (i.e. 1/12 or 1/18 scale) then it is probably a toy
- If it is not made by one of the following manufacturers then it is probably a toy:
  - Team Associated
  - TLR (Team Losi)
  - Kyosho
  - Schumacher
  - HPI
  - Xray
  - Team Durango
  - Tamiya
  - Traxxas
  - Yokomo

That being said, some “race” car manufacturers do make “toy” grade RC cars. In general these will be either 1/16 or 1/18 scale (or smaller) and are best avoided as there are no clubs in Australia that race them at present.

## What does "RTR" mean?

“RTR” means “Ready to Run”; the car will be fully assembled and ready to race straight out of the box. The only things you generally need are a charger and batteries for the car and transmitter.

To all intents and purposes, an “RTR” car is the same as a “race” version of the same model. The difference is that high performance parts that come as standard on the “race” version will be options that you will have to buy later (if so desired). A typical difference is that the shock absorbers on the “RTR” will be plastic whereas the “race” version would have alloy shocks.



Figure 4 – Team Associated RC10 B4.2 RS

Given that this guide is predicated on the concept that you, as the reader, are completely new to the sport then there is absolutely no reason not to buy an RTR car, on the proviso that it is from one of the “race” car manufacturers.

Several “race” car manufacturers produce RTR versions of their competition models. They are:

### 2wd Buggy

- Team Associated RC10 B4.2RS RTR
- TLR 22 RTR
- Kyosho RB6 Readysset

### 2wd Stadium Truck

- Team Associated T4.2RS RTR
- TLR 22T RTR

### 2wd Short Course Truck

- Team Associated SC10 Race Spec RTR
- TLR 22SCT RTR
- Traxxas Slash RTR
- HPI Blitz
- HPI Blitz Flux

## Who makes the other things I need? What are they?

The following is intended to provide a sample list of manufacturers that produce reliable, competitive equipment. If you have purchased an “RTR” car then you will more than likely only need a charger and some tyres from this list.

It is not exhaustive but should point you in the right direction when you want to upgrade your “RTR” car or if you want to start out by only buying racing equipment:

**Tyres** – In the main, tyres that work on Australian dirt tracks are produced by Jconcepts, Pro-line and AKA and are widely available from model shops.

**Motor** – Reedy, Novak, Thunder Power, Trinity, Orion, Turnigy – 540 size, start with a 21.5t and work from there – go for sensored rather than non-sensored, they are faster and more efficient

**Electronic Speed Controller** – Tekin, Orion, LRP, Novak, Turnigy – as a beginner you will probably need an 80a speedy at the absolute most. Check the item description to make sure that your chosen model can work with sensored brushless motors and Li-po batteries

**Radio** – Spektrum radios are the most popular amongst beginners at present; you will need at least a three channel system. The DX4C is four channels and would be more than up to the job. You are looking for a package which includes a transmitter and receiver.

**Steering servo** – Hitec, JR, Spektrum, Air Tronics, Ko Propo, Futaba - You will need a “standard” sized servo for the steering – the dimensions of a standard servo are approximately 37/20/41mm (L/W/H).

**Batteries** – Orion, Reedy, LRP, ProTek, Turnigy - You cannot go wrong with “Turnigy Nano-Tech” batteries,

they are only available from HobbyKing.com, but are fantastic value and some of the top racers use them too.

**Charger** – Orion, Tekin, Turnigy - go for a mains (AC) powered “Li-Po balance” charger

The image below illustrates how the electrics are arranged in a typical racing car, in this case a Team Associated RC10 B5.

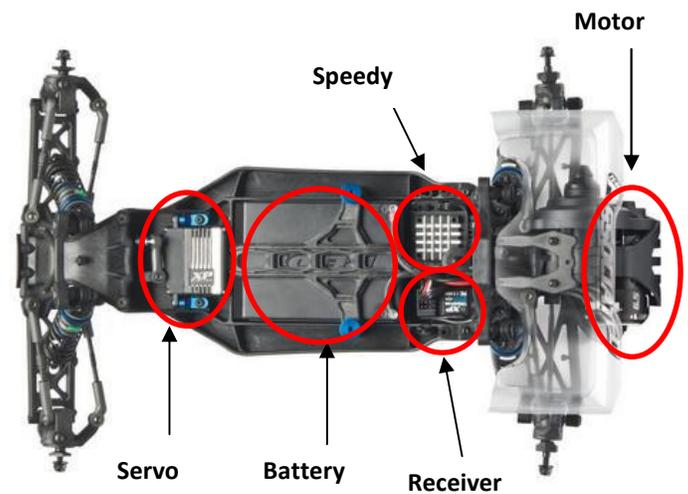


Figure 5 - Electrics layout - RC10 B5

## Where can I buy my gear?

Your local model shop is a great source of advice and local knowledge. That being said, better deals can sometimes be had by shopping online, just bear in mind that shipping to Australia can be expensive, particularly when you are buying vehicles or batteries.

The following provides a useful list of reputable RC dealers in Victoria and beyond, is in no particular order and is correct as of 1 January 2015:

### Victoria

- Metro Hobbies – [www.metrohobbies.com.au](http://www.metrohobbies.com.au)
- R.A.B Hobbies - [www.rabhobbies.com.au](http://www.rabhobbies.com.au)
- The HobbyMan - [www.hobbyman.com.au](http://www.hobbyman.com.au)
- Traction RC – [www.tractionrc.com.au](http://www.tractionrc.com.au)

### Australia

- RC Race Supplies - [www.rcracesupplies.com.au](http://www.rcracesupplies.com.au)
- Ryper Hobbies – [www.ryperhobbies.com.au](http://www.ryperhobbies.com.au)
- Northern Beaches Hobby Centre - [www.nbhc.com.au](http://www.nbhc.com.au)
- RC Hobbies – [www.rchobbies.com.au](http://www.rchobbies.com.au)

### Worldwide

- Amain Hobbies - [www.ain.com](http://www.ain.com)
- HobbyKing - [www.hobbyking.com](http://www.hobbyking.com)

### Second-hand

Great deals can often be had by buying second-hand. Refer to the lists of manufacturers and models for a guide of what to look for and you could snare yourself a decent race package for a reasonable price.

In general you can make big savings by buying used vehicles, radio gear and chargers. However it is recommended, on the basis of reliability if nothing else, that batteries and motors are always purchased new.

The usual rules apply, if it looks too good to be true then it probably is, and try to deal with people that you know or that are reasonably local to you. By keeping an eye on various websites you can get a picture of what things are worth and if you are in any doubt then ask someone at your local club before you part with your hard earned.

- Ebay – [www.ebay.com.au](http://www.ebay.com.au)
- RcTech for sale pages - [www.rctech.net/forum/australia-sale-trade-103/](http://www.rctech.net/forum/australia-sale-trade-103/)

## Common Errors

There seems like a lot of things to learn, however, RC racing is very straight forward. These are some common mistakes that newcomers often make:

- Trying to go too fast too soon. Driving is harder than it looks, if you start off with less speed (i.e. a slower motor) then you will generally get the hang of it in less time
- Not checking the car. Most reliability and handling problems are due to components not being lubricated or assembled correctly. Always read the manual, and make sure that all moving components (suspension, drive train etc) are free and do not bind on anything
- Accidentally buying a toy – refer to the list of manufacturers on Page 10 for guidance

## How much is this all going to cost?

Not to scare anyone off at this stage, but realistically the sky is the limit. That being said it is very possible to get started for less than \$500.

## How do I build a "kit"?

Competition RC cars come in "kit" form, building one takes around half a day. Then you will need to spend some time painting the bodyshell (which can take a while). Each kit comes with a detailed set of instructions and basic tools.

Building the car is very straight forward and is an excellent way to familiarise yourself with how the internals work. In this way, if something does go wrong then you may have a reasonably good idea how to access the offending part. If it is the case that your car is either "RTR" or second-hand then it is always a good idea to have a go at taking it apart. Instruction manuals (in the case that your used car didn't come with one) are easily downloaded from the net and if you do get stuck then don't be afraid to

take the car down to your local club and ask one of the racers to have a look, nine times out of ten somebody will be familiar with your car and be able to lend some advice.

## Car building essentials

- Spray paint (only use "polycarbonate" paint – trust me) - for the body shell
- Soldering iron and solder – to do your wiring
- Sticky-back velcro – to hold the body on
- Double sided tape – foam type such as "3M Scotch Heavy Duty Exterior Tape"
- Allen (hex) wrenches
- Super glue – for your tyres – buy good glue otherwise they will probably fall off in a race
- Stanley knife
- Sharp scissors - nail scissors are good if you have nothing else, you will need these for cutting out the body shell and wing, the scissors need to be small so as to not scratch the paint
- Heat shrink – to cover up any exposed wire
- Cable/zip ties – to tidy up your wiring, buy the smallest ones you can find

With the exception of the paint (which you have to get from your local model shop) everything listed above is available at Bunnings.

## What is the Radio Gear?

The Radio is made up of three components:

- Transmitter – wheel or stick type, although stick radios are very rare in Australia
- Receiver – takes the signal from the transmitter and distributes it to the servos and speed controller
- Servo – provides steering force



Figure 5 - Spektrum DX4C

The current industry standard is a radio system that operates on 2.4 GHz. Essentially the system continuously scans the available frequency range for one that is not being used and transmits on it. In this way multiple cars can be run at the same time without interference.

In the old days, radios would have a pair of matched crystals (one in the transmitter, one in the receiver) and each driver would use crystals with different frequencies, the bands used were 27 and 40 MHz.

These systems are still available and are perfectly fine for racing although they are a fairly rare sight nowadays.

A radio gear package will generally come with a transmitter and a receiver; you will also need a servo which will usually be purchased separately.

The servo is the device which connects to the front wheels to provide steering. Several manufacturers produce them. As a beginner you would be wise to select one that has metal gears as they are significantly more robust. Each servo has a set of specifications including the amount of time (in seconds) it takes for the servo to reach a particular angle (usually 60 degrees) with a given voltage (usually six volts).

For racing you want the fastest servo you can afford as this will allow the car to respond more quickly in the turns. A fast servo will be rated at less than 0.1 seconds to 60 degrees. Don't worry if you can't afford one that is quite that fast straight away.

## What is an Electronic Speed Controller?

Electronic speed controllers (Speedy) send power from the batteries to the motor and are usually rated in terms of the amount of current (amps) they can handle. Typical speedys for RC car racing are rated between 50 and 160 amps (50a to 160a) and most can operate in forwards or reverse.

As a beginner you are looking for a brushless speed controller that is rated at between 50a and 80a. Ensure that your speedy is "sensored" (refer to the section on motors below) and that it can run with Li-Po batteries. This information should be in the item description.

Most websites will have a dedicated section on speed controllers for RC car racing. As ever, be sure to read the instructions fully before you start and also refer to the "battery" section below for details about connectors.

## What is a Battery Pack?

Lithium Polymer (Li-Po) batteries are the current industry standard power source for electric racing. They come in four flavours; shorty, saddle, square and full size packs. Shorty packs will fit in 90% of vehicles on the market today so go with them to start with.

In terms of capacity, measured in milli-amp hours (mah), any Li-Po battery pack on the market today will easily last a 5 minute race. However, to future proof your purchase it is probably best to go for the highest capacity packs you can afford.

Li-Po's also have a "C" rating and this varies quite dramatically between manufacturers, in real terms it is largely irrelevant unless you are at the pointy end of things, so don't worry about it too much to begin with.

Battery packs will also be described in terms of the number of "cells" and are available as 1s, 2s, 3s all the way up to 7s, with the "s" denoting cells. RC car racing uses 2s battery packs.

Be sure to only purchase "Hard-case" batteries, it will be clearly stated in the product description. "Soft-case" batteries are available and are often cheaper but this is a false economy as you will not be allowed to use them at race days (they are considered to be unsafe).

You will need at least two battery packs for a race day and ideally three; however, Li-Po's do not seem to mind being charged more than once in a day so it is not crucial to have lots of them.

Always read the instructions as Li-Po's are very particular about how they like to be treated and it is easy to ruin your new battery by charging or discharging it incorrectly.



Figure 6 - "Shorty" Li-Po Battery Pack

Connectors are something that often catches people out. All Li-Po packs use 4mm gold plated connectors (sometimes called "Coralley Connectors"). You will need to get hold of some "male" connectors to put on your speed controller, as most do not come with them pre-attached. They are readily available and not particularly expensive.



Figure 7 - 4mm Gold plated connectors

## What is a Brushless Motor?

1/10 off road cars use 540 size electric motors and the performance of any motor can be estimated from the number of turns (8.5t, 7.5t, 17.5t etc) the higher the turns the slower the motor. They can also be described in “Kv” which is, put simply, revolutions per volt. The higher the Kv the faster the motor.

Different classes of racing may be limited in terms of the motor that you are allowed to use. For example the “stock” class is limited to 17.5t whilst the fastest motor you can run in the “stadium truck” class is a 10.5t. Websites such as Hobbyking.com have a dedicated section for motors that are suitable for different categories of vehicles (cars, trucks etc).

You are looking for a “sensored brushless” motor. Non-sensored motors are available and work perfectly fine; however, sensored versions are more efficient and generally faster.

Most beginners will start with a 21.5t motor and work from there.

## What type of Charger do I need?

Any Li-Po “balance” charger will do the job. Make sure that it is mains powered (AC) so that you can use the club power supply for charging your batteries.

## What is a Transponder?

Transponders are devices that are placed inside the car and count each lap that the driver completes. They work by transmitting a signal to the timing computer via a loop of wire that is usually buried in the ground.

A Dutch company, AMB ([www.mylaps.com](http://www.mylaps.com)), makes all of the transponders in the world. Name any racing based competition from V8 Supercars to the Olympics and you are guaranteed to find an AMB transponder counting laps or timing races. In RC racing terms they

are split into two categories, club and personal transponders.

### Club Transponders

Every club will have a collection of transponders that can be used on a race day. They are usually numbered 1-10 to correspond to the cars race number and are mounted from a hole cut in the front windscreen of the body shell. You collect your transponder from race control before the race and then return it immediately afterwards. There is never any charge for using club transponders because, up until about 10 years ago, everyone, from world champions to complete novices would use them.



Figure 8 - AMB "Club" Transponder

### Personal Transponders

Personal transponders (PT's) are mounted inside the car, usually with double sided tape, and have a unique number that corresponds to the driver as opposed to the cars race number (more on this later). They cost around \$80 at the time of writing. Power is supplied through the receiver and you need to tell the club your unique number in order for your laps to go against your name (the number is printed on the transponder).

There are currently three types, AMBrc DP, “MYlaps” RC4 Hybrid, and “MYlaps” RC4 Pure, they are all basically the same and should all work at your local club (though it is always best to check!). The image below shows a “MYlaps” RC4 Pure PT mounted in a Kyosho RB6.

There is a company in the UK called MRT which sell “cloned” transponders, basically a second unit with the same unique number. In this way you can run multiple cars on the same transponder number. Whilst this is useful, you will still need to buy an AMB transponder to get the number in the first place.

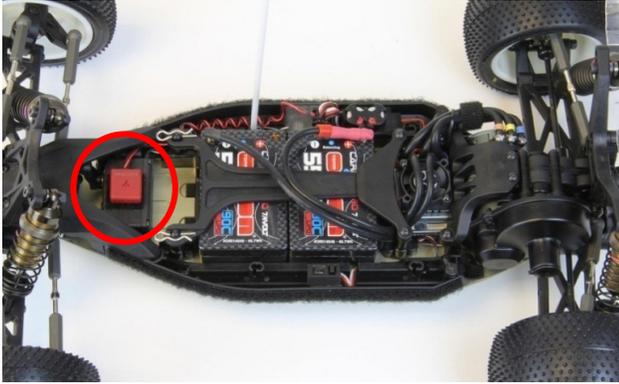


Figure 10 - PT mounted on top of the servo in a Kyosho RB6

## What are Wheels, Inserts and Tyres?

The wheels of an RC racing car are made up of three components:

- Rims – made of nylon, all modern buggies and stadium trucks use 2.2 inch diameter wheels, and most are 12mm “hex” type. Short course truck wheels have a different diameter on the outside of the to the wheel to the inside, usually 2.2/3.0 (outside/inside)
- Inserts – made of foam, can be either open or closed cell type, are placed inside the tyre to maintain its shape
- Tyres – different manufacturers offer tyres in various compounds and tread patterns. For example Jconcepts “3d’s” are available in “green” and “blue” compounds where green are the softer of the two.

## What accessories/spares will I need?

For your race car:

- Spares – suspension control arms (wishbones, a-arms), spur gears, pinions, shock oil
- Tyres – you won’t need hundreds of them, but they do wear out quite fast on dirt
- Body clips – you will need these to hold your transponder in the car
- All of the bits and pieces listed under “car building essentials”

Generally:

- Extension leads – mains power for charging batteries at the track (20m at least)
- Power board – for plugging in multiple items and sharing extension leads
- Pit table – a simple plastic folding table will suffice
- Shade – a basic gazebo will do, this is a nice to have for hot days and is not strictly essential
- Lunch – or the address of the local Macca’s

As before, all of these things are available at Bunnings (even lunch in some cases!)

## What is a Race Meeting?

Race meetings, at a State level, can be broken down into four categories:

- Club Meetings
- Drivers Series
- State Titles
- One off events such as the Keilor Invitational, or the Coleman Cup

As a beginner you only really need to focus on Club meetings, these are generally held every two weeks. Calendars are usually posted on the clubs website, or check the relevant RcTech forum thread for updates (cancellations due to bad weather etc).

A Club meeting is intended to be a laid back affair. Everybody still wants to win, but nobody is racing for sheep stations and the atmosphere is therefore generally jovial and relaxed. Everyone is welcome at a Club meeting.

The next step up the racing ladder would be the Organisation of Radio Race Car Association (ORRCA) Victorias "Drivers Series". There are four Drivers series meetings each season and the venue rotates around Victoria's five affiliated off road clubs.

At the top of the pile, on a State level, is the Victorian State Titles (the Vics). These are held once a year and the venue is changed annually. For example, the 2013 Vics were held at Wodonga, in 2014 the Knox club was the host.

## What classes of racing are there?

The classes of racing at a club day in Victoria can generally be classified as follows:

- Novice
- 21.5t Buggy
- 17.5t "Stock" Buggy
- Stadium Truck
- Short Course Truck
- Modified Buggy

This guide has been written on the basis of you (the reader) being a complete beginner. In which case, more likely than not, you, or your young person, will start your racing career in the "Novice" class. In general the Novice class is open to all types of 1/10 scale cars, be they buggies or trucks, and the rules don't tend to be strictly enforced. The idea here is to learn how to drive in a racing environment.

After a few months drivers have usually gained enough confidence to move up a class. In this case you would then begin to compete against cars of the same type as yours. For example, if you had elected to purchase a buggy then you would more than likely move up to 21.5t Buggy.

That's not to say that there are entry requirements that restrict movement between classes. Any driver can race in any class at any time. The general rule is that as you move up the classes, with "Modified Buggy" being widely regarded as the top of the tree, the cars become incrementally faster and therefore the skill level required to compete at the front becomes commensurately higher.



## How does a Race Meeting work?

Most racers will be trackside on a club day by 0830hrs and drivers briefing will usually happen at around 0900hrs.

These are the highlights of any race day be it club, drivers' series, state titles or indeed nationals:

### Practice:

Everybody can benefit from having a run around the track and it will generally be open early on a club day to allow drivers to cut some laps in advance of the meeting proper.

### Registration:

At the start of the day you need to tell race control that you are present and to register your cars, at this point you will also be asked to pay race fees for the day.

Your first race meeting is usually free and then race fees on a club day are (depending on the club) in the

region of \$10 thereafter. Registration usually closes at around 0900hrs, although a lot of clubs are starting to offer online registration in order to save time on race day.

### **Drivers Briefing:**

The Race Director will run through the format of the day and remind everyone of their roles and responsibilities. It usually lasts around ten minutes and every driver is expected to attend.

### **Qualifying:**

A heat sheet will be posted immediately after drivers briefing, this will detail your car number and which race you will be in. Be sure to note all of this information.

A heat will be composed of up to ten cars and will last five minutes. Cars are released at one second intervals (known as a staggered start). The computer will call out your name, this is your cue to start racing, at the end of the race the computer will call your name again to indicate that you have finished. At this stage of the day you are racing against the clock and the target is to post as many laps in the shortest time possible. There are usually three rounds (i.e. you will get three races) of qualifying with your two best results counting towards your position for the Finals.

### **Finals:**

After qualifying has ended (and, more often than not, a break for lunch), drivers will be sorted into finals. A revised list will be posted based on your performance in qualifying. The fastest ten drivers in your class will make up the "A" final; the next ten will be in the "B" final and so on. Be sure to note your race number and position as this will have changed.

Finals starts are grid based, exactly the same as real motor sport. The grid will be painted on the main straight, make sure that you know your position so

that you can line up in the correct spot. The computer will count down from ten and then it will say "*Drivers, watch your cars*". After a random pause (usually two to three seconds) a buzzer will sound, this is your cue to go. As with qualifying, the computer will call your name when you have finished.

A day of racing is usually (depending on the number of drivers) all finished by around 1600hrs.

## **What will be expected of me?**

The only significant expectation, aside from playing fairly at all times, is that you (or your young person) will be required to marshal the race after yours. Marshalling is very simple, there will be witches hats spread around the track with numbers on, simply stand next to the hat corresponding with your car number and retrieve any stranded or over-turned cars during the race.

You must be at your hat before the race starts and stay there until it finishes. Here are some top tips:

- Always watch your corner of the track, it is very easy to get distracted by what else is going on in the race and miss a car that has turned over in front of you
- No food, smokes or drinks are to be consumed when marshalling
- Mobiles phones should not be taken on to the track
- Do not be afraid of picking the cars up. As long as you avoid the rear end (where the motor usually is) then they will not be hot. The cars are tough as nails and it is extremely unlikely that you will break one just by handling it
- If the wheels of the car are moving then wait for them to stop before you attempt to pick it up
- Always look before you leap, if one of the cars hits you on the ankle then it will sting (a lot) but probably won't break either you or the car

- Always make sure the track is clear before you put the car down to avoid causing an accident
- Always try to place the car back down facing in the right direction
- Open toe shoes are not allowed trackside
- Children under 15, or that have not been racing for long should be accompanied (by you) when marshalling – they have to learn, just not on their own, that’s not fair.
- If you need help or guidance on race day then just ask, there is no such thing as a stupid question

## How do I prepare for my first Race Meeting?

A wise man once said that if you fail to prepare then you prepare to fail, not sure who that was but they were right. The following is a checklist of things to do when preparing for your first (or any) race meeting:

- Check that all screws and wheel nuts on the car are tight
- Check that the drive train is free and doesn’t bind on anything
- Check that the suspension moves up and down freely – bent shock absorber shafts are a common problem for beginners
- Charge your car batteries
- Check that your transmitter batteries are charged
- Check that your tyres are firmly glued on to the rims
- Check the gearing mesh
- Check that the pinion grub screw is tight
- Check that you have some spares

## What is club membership?

When you have attended a few race meetings, you will be expected to become a member of the club. Your membership fee covers the clubs insurance and maintenance of (amongst other things) the track, timing system and facilities.

Memberships are not particularly expensive and are usually for a period of 12 months starting at the end of the financial year.

You will also be given the code to the track gate to allow you to practice at any time (unless the track is closed due to bad weather). Every club is a community, and members support each other through the learning process. If you were to pop down to the track on the weekend then you are highly likely to find several other club members practicing (this of course is a great opportunity to ask for help/tips)

## Where is my local club?

The following is a list of 1/10 off road electric clubs in Victoria:

- **Keilor** - [www.keilorrc.org.au](http://www.keilorrc.org.au) – just off Stadium Drive inside Keilor Park, Keilor, Melbourne
- **Knox** - [www.knoxrcclub.com](http://www.knoxrcclub.com) - located at 20 O’Connor Rd, Knoxfield, Melbourne
- **Mildura** - [www.facebook.com/mildurarc](http://www.facebook.com/mildurarc) - corner of 12<sup>th</sup> and Riverside Avenue, Mildura
- **Wodonga** - [www.wrccc.net](http://www.wrccc.net) - situated within Diamond Park, Albury-Wodonga
- **Bendigo** – [www.badrc.net](http://www.badrc.net) - Victoria Street, Eaglehawk, Bendigo



## Confessions of a Real Racers Mum

Confessions are a good thing, so here goes.....

My husband is a highly accomplished 1/10th off road RC racer, and I have honestly been totally disinterested in his sport despite being a supporter of his achievements over the last two decades. I didn't understand it, and didn't care to find out either.

All that changed when our (now 8yo) boy decided that he wanted to go racing with his dad. Like any parent I was curious to know whether this sport would be good for him, and in what capacity it could be of benefit.

What I discovered was surprising to say the least. Turns out it is excellent for intellectual, emotional and social development, but also has a very positive influence on physical development. Racing RC cars achieves this by catering to ALL abilities without discrimination on the basis of age, physical impairment or intellectual ability. It is also heaps of fun, and an outdoor activity that distracts from the myriad technological devices that bombard their daily life.

RC racing is one of very few hobbies, sports or activities out there that can place a child with an intellectual disability against other children and adults, and have them still be on an equal competitive footing.

Similarly shy children or those with communication issues can thrive within the RC Racing community. There is no need to say or do anything outside of their comfort zone or ability. In fact, they can be totally silent and this is OK! What I have personally observed is that these children familiarise themselves with the people at the Club, and start taking small steps to communicate with their peers and adults over time as they settle in. Whilst this great for their confidence, it

also aids their social and intellectual development. It gives them a sense of control and of feeling part of a community when in other instances their lack of confidence can sometimes leave them feeling isolated.

Getting started does take a measure of patience from both child and parent alike. This is a good thing! We all know that worthwhile things in life don't come easily, and starting out in RC Racing requires perseverance. When my son first started out, he went down to the track frequently for short sessions and just tried to stay on the track. Honestly, it was a bit of a disaster with him on his roof more than his wheels! Rather than get frustrated, he just laughed as we ran to rescue his car from all points of the track (It was very good physical exercise for mum and dad). Over the few months that followed, the accidents reduced and this little chap, standing on a milk-crate to see the track from the drivers stand, began to start putting in clean laps.

During these practice sessions he met many of the club regulars and would be side-by-side with adults on the drivers stand. They would have discussions, tips and praise for the 6yo doing his best to get around the track. Soon people started to welcome him by name, and he felt a part of a Club despite having never actually raced yet.

Stepping into racing did take some getting used to. But there are always people around to help, and you do get the hang of it quickly. Never be afraid to ask for assistance, RC racers are very generous with their time and will, more often than not, go out of their way to help you out if they can. A great example of this was when, in mid 2014, a longstanding member of one of the Melbourne clubs had all of his racing gear stolen. Individuals pooled whatever equipment they had going spare and managed to assemble a replacement set-up. In this way he was able to continue racing when, being a retiree, he may not have otherwise been able to.

The track-side environment between the races was an added bonus for my son, and a reason I promote considering RC Racing. New children are welcomed quickly, and are encouraged by the other children and families. They look forward to catching up with each other at race days, and accept each other regardless of racing ability. As there is a learning curve in racing regardless of age, they make no fuss about what class they are in and there is comfortable rivalry between the children in the same class with praise for each other whatever the outcomes.

What happened intellectually was quite amazing. His hand-eye coordination, spacial awareness and reflexes continue to improve at a dramatic rate. This is not only excellent for brain development, but also helped him with his fine motor skills which has improved his hand-writing and concentration at school.

What I also learnt is that the sport grows with the child. From early practice days, to Novice level races, and then on to more serious competition at State level meetings, the sport and equipment can grow with the child at the pace the family is happy with. The cost and commitment required generally increases as you move up the levels of competition, from Club, to State and then as far as the Nationals. If this is not for you, then Club level racing is satisfying enough for even the most accomplished drivers. There is no need to progress beyond this unless you wish to.

I firmly believe that almost anyone can participate in RC Racing. It is an activity that has benefits on many levels and can assist with your child's development socially, emotionally, intellectually and physically. You can participate on your own schedule and it doesn't matter if you don't race every week. Whether you just want to practice, or attend Club days (or do a mixture) then you can. RC racing is very flexible, and suits the busy constraints that many families have.

I urge you to come along and take a look at the juniors in action. You will be amazed at how competent these little people can be, and what firm competitors they are against the adults. You might just make some new friends too, as I have.



Hope to see you track-side,

A Real Racers Mum