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XRAY FACTOR
THE T2

TEXT: RRCi
PICTURES: RRCi

HASTA LA VISTA, BABY!

The T2 Has The XRAY Factor, Examined!

When rumours first started in late November about Martin Hudy running a car that was covered with a towel between races, the internet forums and news sites started generating a buzz that had XRAY touring car owners worried – with less than ten months since the release of their last touring car, did this mean their T1FK'05 cars were suddenly obsolete?

Shouts and cries were soon calmed by continued success for the FK'05, with major race wins in the US and Europe – the FK'05 certainly wasn't going to be made worse by whatever XRAY was working on, and the 'FK'06' (what the punters thought the new name would be) wouldn't be released until February...or so they thought! Once pictures (and logos) leaked onto RC forums in mid-December, the truth couldn't be denied any longer – the T2 was on the way!

STARTING AFRESH

The 'T2' designation should be the first clue that this is an all-new touring car for XRAY. Their first car was called the T1, then the other models like the T1R, T1 Evo, etc. – everything followed on from the original T1. Therefore, the T2 represents a leap forward in design philosophy, yet it still retains many of the same features (and even a few parts!) of the T1FK'05.

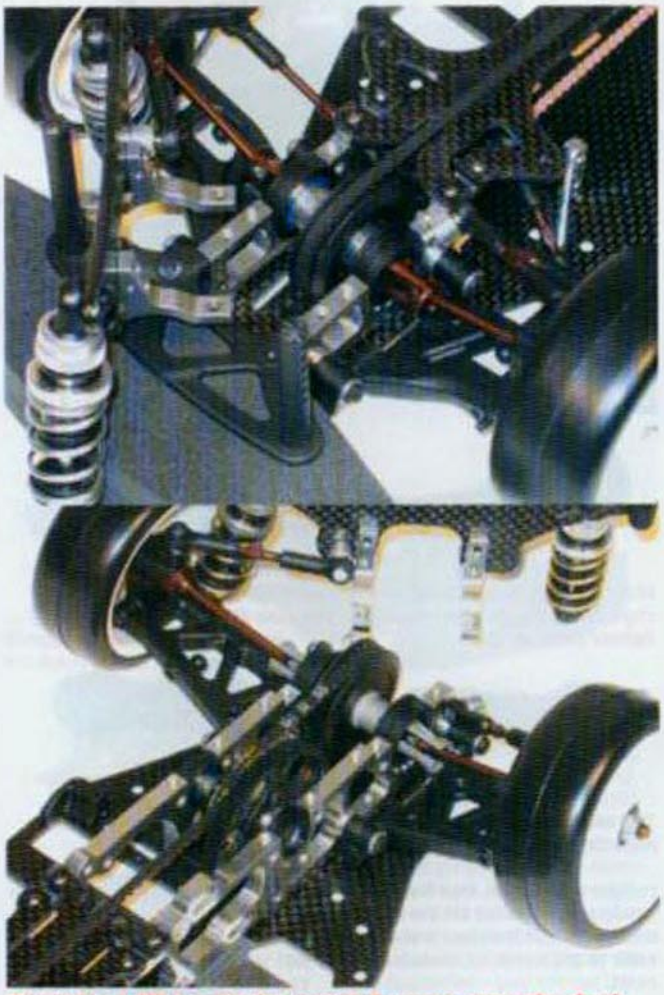
Gone are some of the standard XRAY TC features that long-time XRAY fans may expect to see – for example, wheel-nuts are used now instead of the screw and washer system. Standard-looking universal dog-bones replace the chunky universals of all the previous kits. Also, the plastic parts like suspension arms, uprights and C-hubs, are completely new. However, certain parts of the FK'05 drivetrain will fit straight onto the T2: the front and rear belts, layshaft pulleys and of course the shock springs, even though the T2 shocks are slightly shorter overall (due to new shock shaft ends).

FULLY EQUIPPED

Slicing open the bag with the manual and decals, you get a few nice surprises. Along with the catalogues, you get a nicely printed colour instruction manual, an even thicker set up book just for the T2 (very nice indeed!), a colour gear chart sheet with rollout calculated for rubber AND foam tyres (meant more for US racers but could be handy for us here in old Blighty), blank set up sheets and recommended starting set ups for both rubber and foam tyres. A massive sheet of pre-cut XRAY T2 decals and a certificate with your car's serial number is included in the bag as well.

ALLOY BACKBONE

The woven graphite chassis, which is the narrowest chassis available at 104 mm wide, has the front and rear bulkheads



Removing a diff is a simple process: 6 screws, move the shock tower, front or rear, done!

The awesome Multi-Diff - only available from XRAY!

The hollow aluminium centre shaft is extremely lightweight and functional

installed on it from the factory. This is a nice touch, reminding you of how low the drive train sits (a far cry from the original T1 car!), although you do need to remember to file the battery slots (including the battery tape slots) and CA glue the sides of the chassis before you start assembly. I was a little surprised to see thin battery slots instead of contemporary extra wide slots (for cooling batteries, presumably) that appear on most other touring cars. Time will tell if this leads to hot batteries, but with today's high-capacity cells not too many racers are over-gearing their cars, I'd guess!

You've probably seen the preview pictures of the T2, with polished bulkheads, but the T2 stays away from the buffing wheel – although there's nothing to keep you from adding a bit of bling to your ride and polishing them yourself!

Remember that you'll need to apply some CA (cyanoacrylate) glue to the edges of the chassis. The simplest way to get perfect results is to first give the edges a rub with fine-grit sandpaper. Spray CA accelerator on a portion of the edge then apply some thin CA glue to the edge of the graphite piece and let it run down a bit. Continue around until the whole thing is done. You have a nice 'team driver' look with repeated applications.

Rear diff is fully enclosed for a longer, smoother life

attaining a pretty rounded edge with practice. Any drips on the flat sides taken off with a towel soaked in CA debonder or acetone. For a true 'I have too much time on my hands' look, do the edge trick for the shock towers and upper deck.

DRIVE TRAIN

UK drivers will rejoice that the vaunted XRAY Multi-Diff and Kevlar-reinforced belts are included with their kits. Due to market demand, drivers in the US don't get these bits, substituting a second ball differential for the Multi-Diff because of a higher proportion of carpet racers there.

The Multi-Diff is one of those 'why didn't anyone come out with this before?' type of innovations. Of course, XRAY did offer this before, for the T1FK'05, but for those unfamiliar with it, here's a primer: Rather than offer a separate spool and front one-way, XRAY invented something that can do the work of both spool and front one-way, as well as acting as a locked front one-way (both wheels freewheel as with a normal one-way but they rotate at the same speed), which works sort of 'between' a front one-way and a spool. A full explanation is provided in the T2 Set-Up Book, so be sure to give it a read.

Getting to the diffs is easy, too – once the car is fully built, it takes just six screws to get to one diff. The centre layshaft is also held in with six screws, so it is easy to pull out the layshaft to change spurs or to swap a fixed pulley for a one-way pulley.

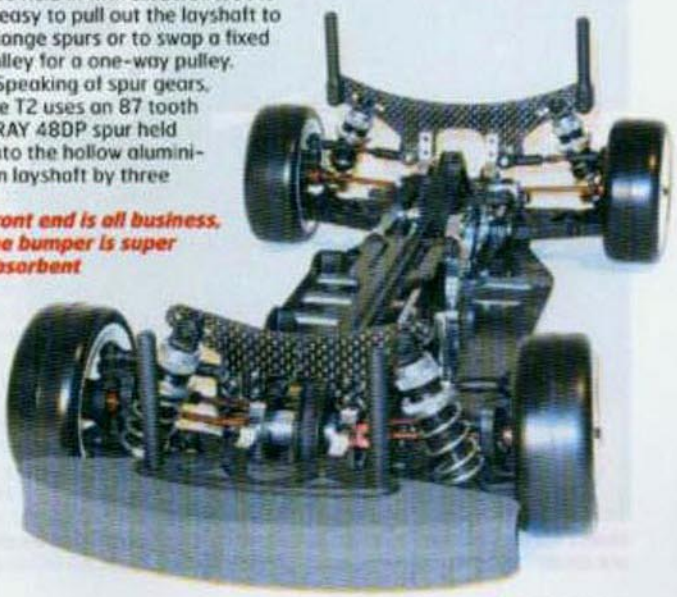
Speaking of spur gears, the T2 uses an 87 tooth XRAY 48DP spur held onto the hollow aluminium layshaft by three screws. This car is all about drive train efficiency and lightness! Compared to the drive train on a similar belt-drive car from another manufacturer which had seen several dozen runs already, the T2 was able to freewheel longer and felt smoother, all without degreasing the bearings or running in the drive train!

Finishing off the drive train are T6 aluminium clamp-style hex adapters. Wheel-nuts make their first appearance on an XRAY touring car, and attach the wheels to the Hudy Spring Steel universal joints. The handy pin pads on the universals should help the diff out-drives last for ages, and are easily replaced. The wheel bearings are smaller than on previous XRAY touring cars, allowing the use of standard-appearance universals.

SHOCKS

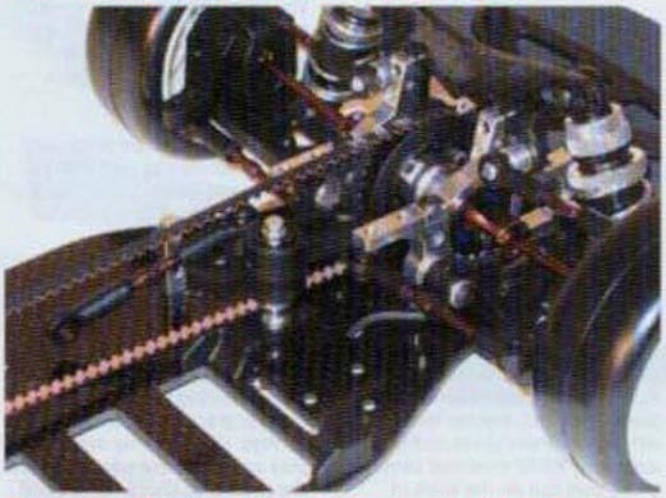
It had been a while since I've built XRAY shocks and it was a pleasure to build up the plastic-bodied shocks that came with the T2. Wait a tick, you say...plastic shock bodies? Don't worry – these are as smooth as you'll find anywhere, and all the niceties are included: silicone shock oil, shock bladders, expansion foam, threaded shock bodies, o-ring equipped shock collars, precision-ground XRAY springs, single o-ring design, plus an innovative way to attach the shocks to shock towers and suspension arms. More on this later. In short, you won't be disappointed with the shocks! To top it all off, you have the option of building them with externally adjustable pistons, or with standard one-piece non-adjustable pistons.

Follow the instructions and build the shocks all at once in a sort of assembly line process and you can't go wrong. Remember to build the shocks to the same length, borrow a set of



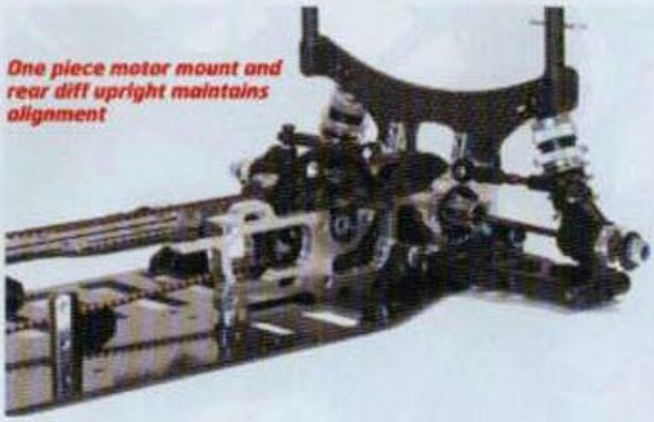
Front end is all business, the bumper is super absorbent

Fully built, and XRAY quality oozing from every pore

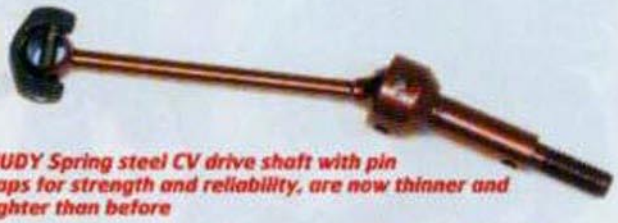


Turnbuckles throughout for accurate set up, and Hudy Spring steel components build confidence

Multi Flex technology, the sips cut allow flex which is tuned by the top deck



One piece motor mount and rear diff upright maintains alignment



HUDY Spring steel CV drive shaft with pin caps for strength and reliability, are now thinner and lighter than before

The cool new eccentric camber link mounts for quick roll centre adjustments - it really works!

callipers if you can. Use fine sandpaper to round off the top and bottom of the plastic shock ends to get a precise measurement.

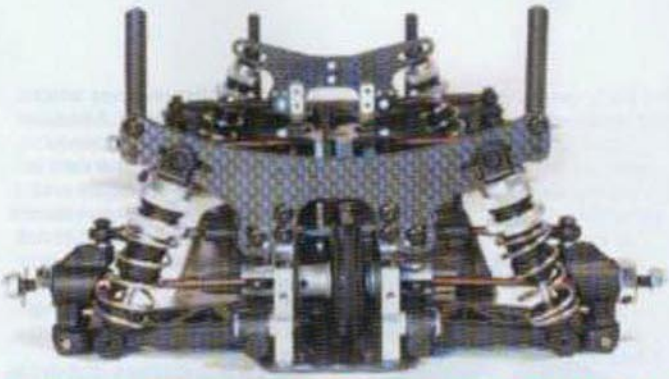
SUSPENSION AND TUNING

'Conventional' C-hubs make it easy for drivers to know exactly what the caster setting is. Uprights and steering knuckles from the TIFK'05 won't carry over, however. The stock setting for the T2 is four degrees of caster, which is a good all-around setting that will suit most conditions and drivers.

A multitude of tuning options exists for the suspension. The front and rear arms each have two shock mount holes, and there are five mounting positions on the front shock tower, with six on the rear shock tower! Finding the right balance for your driving style won't be a problem. On the lower arms, the shocks mount to a 3 mm set screw, which is threaded into the appropriate hole. A pivot ball is popped onto the shock shaft end, and a 3 mm Allen wrench is used to screw the pivot ball onto the setscrew. The top of the shock is mounted in a similar way, except a 6 mm screw from the opposite side of the shock tower holds the shock in place. Quick shock position changes require just one screw to change positions. This is handy when you don't have much time between heats, or have many tasks to do when you get to your pit table.

As far as tuning goes...well let's just say it's easier to list what you CAN'T do with the car, than to list what you can do. Every single possible adjustment you can think of can be done to the car, including changing anti-dive, anti-squat, track width, rear toe (without changing rear hub carriers – bonus!), front inner hinge pin angle, roll centre, plus all the usual like caster (with optional caster blocks/C-hubs), camber, front and rear toe, etc. A selection of hinge pin mounts adjust the roll centre and dive, squat and kick-up, whilst silver aluminium spacers control the width, wheelbase, rear toe and more. If this is your first XRAY I'd suggest you get part numbers 303120 and 303121, this will equip you with XRAY spacers ranging from 0.5 mm to 3 mm, everything you need to fully control all the settings on your car.

The genius of the XRAY T2, and one of its major selling points, comes in adjusting the stiffness of the chassis. To tune the car for various grip levels, the majority of the stiffness settings will be made by adding or removing screws from the top deck. For low-grip track surfaces just use the front two and rear two screws for the top deck, and no standoffs under the rear top deck. If the track has extreme low grip, you can even remove screws that hold the bulkheads



Spacers under inboard pivots set inboard rear toe. The hole in diff allows slip adjustment in situ

Simple, clean and functional. It's what XRAY is all about

Twin belt layout is simple and efficient, with no tensioner or idlers

to the main chassis – the pair that are just in front of the curved chassis cut outs.

For a higher grip track, or later in the race meeting as the grip level comes up, use four screws each at the front and rear of the top deck, and/or the aluminium standoffs under the rear top deck. With very high grip tracks, such as a carpet track in the late stages of a race meeting (when traction is at its highest), use the front and rear standoffs and all the top deck screws to make the car as stiff as possible. In addition to all these options, it would appear that XRAY will be releasing stiffeners for the upper deck, as there are two pairs of holes down the centre split – these look ripe for aluminium stiffeners a la the adjustable upper deck for the T1FK'05!

STEERING

The single-bell crank steering system runs super smooth and uses a minimum of connections between servo and front wheels. The servo saver is already installed for you from the factory, and it rides on a single steering post that is held in place by two small metal-shielded bearings. Ackerman setting is as simple as can be – pop off the top deck and reverse the keyed plastic bearing insert that rests in the main chassis and top deck. Simple! The steering knuckles also have two holes for getting different steering action, because I'll be building the car to the recommended rubber tyre set up I chose the forward (#1) holes on the steering knuckles.

ASSEMBLY

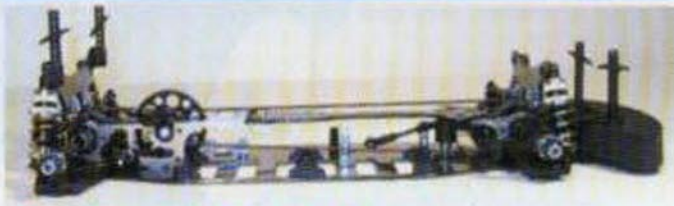
Although I've mentioned the assembly of the car throughout the rest of the article, there should be a section specifically mentioning the ease with which everything went together. With the colour CAD drawings, overview of the steps and life-size drawings for the turnbuckle and screw lengths, it was very easy to get the T2 together. No missing parts at all, which is what you expect from a top name company like XRAY. Assembly took roughly 4-5 hours with hand tools, plus a little time for trying to cover up mistakes while CA gluing the edges of the chassis. So, a couple of movies in the DVD while you're building and you're all done.

FINISHING IT OFF

As I mentioned above, the set up I chose to use for the car was the rubber tyre set up, which is

build tips

- File the battery slots, tape slots and CA the sides of the graphite pieces. See article text for a team driver tip!
- Check the pre-assembled ball diff after installing the tyres and after the first couple of runs, it may need tightening. Inspect the screws holding the lower bulkheads onto the chassis, just to make sure they're tight.
- Make sure you have the top deck mounted the correct way in step 5, page 19
- Use fine-grit sandpaper handy to round off shock pistons and the shock ends, so you get smooth shock action and the right measurement for the shocks.



Low, low low – how low can you go?

included with the kit. I chose this because the track where I race the most is a small indoor carpet track that is set up each week in a local village hall. This track's features are medium grip with a short straight and many right-angle turns. This meant not using the motor mount brace, no standoffs for the upper deck and only the front two and rear two screws for the top deck. I also use a slightly shorter wheelbase than called for in the kit manual. On a larger track (think any track where 1:10 IC is run) I would have used the longest wheelbase option and probably also change the kick-up and width because of extra bumpiness at top speed.

For anyone running foam tyres, the T2 was designed from the outset to allow the use of 30 mm wide rear foam tyres. I'm not sure how many clubs allow foams to be used during their meetings, but if you are able to do this, then you'll be glad XRAY include foam tyre tuning tips in the T2 Set Up Book, including what tyre diameters to use for practice, qualifiers and finals!

Speaking of the Set Up Book, this is definitely one of the things that lets XRAY say their cars are truly 'luxurious'. The Set Up Book is so packed full of information and tuning advice on a wide range of car settings, gear choices, tyre selection and more, it's actually thicker than the assembly manual! There's no denying that XRAY really want the owners of their cars to be the best they can. After all, 'win on Sunday, sell on Monday' right? Indeed!

The only pieces you may want for tuning, in addition to the XRAY Selected Ultimate Spring Set (#308390), are the chassis weights (#309820 for the front, #309830 for the rear), aluminium spacers (#303120 and #303121) for adjusting rear toe, camber link locations and track width, and an extra pair of top deck standoffs (#306511) if you do racing on high-grip surfaces. The XRAY graphite motor guard (#303060), originally made for the T1FK'05, will fit straight onto the T2 as well.

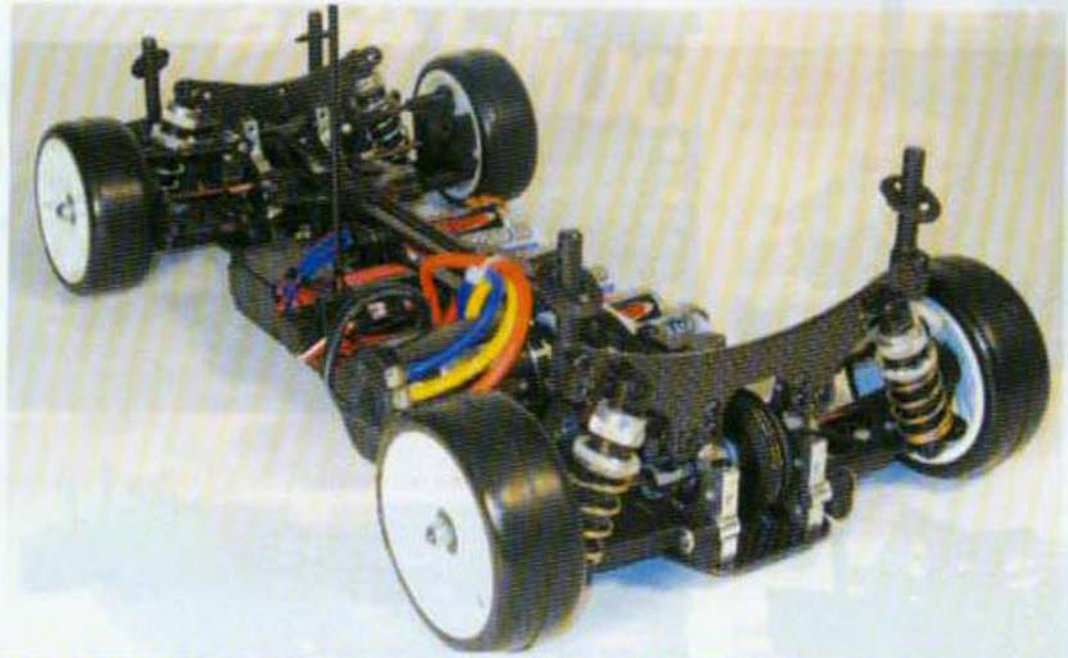
Future tuning options will invariably include anti-roll bars and optional C-hub caster blocks, plus team drivers have been seen using a wider top deck and rear top deck to use extra standoffs, useful for very high grip carpet tracks. The stock arms already have moulded-in letters, so expect arms in various degrees of softness and hardness.

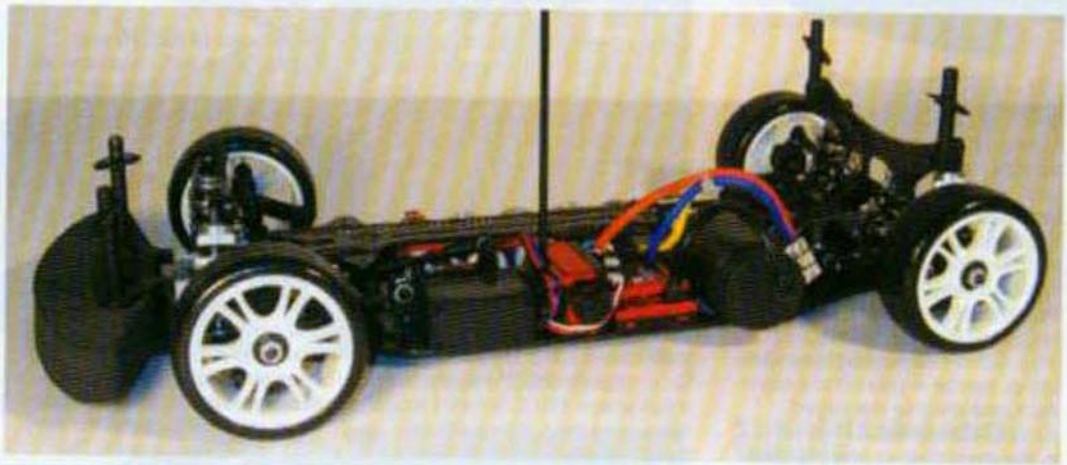
FITTING IT IN

As is the trend with electric touring cars these days, the upper deck is very narrow and doesn't provide much room for installing electronics. Added to the fact that the top deck is an active part of the tuning of the car, with its multiple moving sections, and you really shouldn't stick anything at all on the top deck anyway! With the narrow chassis, small components will be helpful – that 5-year old speedo and stock AM receiver might be pushing it on this car!

The servo attaches to the main chassis with silver aluminium mounts – so max points for style! We chose a KO Propo PDS-2363 ICS servo for its speed and durability. No slouching here with old tech! A Hitec servo horn is not included with the car (KO and Futaba servo horns are provided), so if you use one of these you'll need to use the horn included with the servo.

To take commands from the radio, we chose a Nosram





Gemini 40 MHz receiver, which sits next to the servo. A Nosram Dominator Evolution speedo controls the action and slots in nicely between the motor and receiver. Just to see what the car looked like decked out all in red, we put in a Nosram brushless motor and Matrix speed controller in! Powering everything was a set of VTEC 3800SP batteries.

We used strapping tape to hold the batteries in; this is recommended in the manual although a battery strap will be offered as an option. I tend to agree with the manufacturers that say using a strap can tweak the car a bit, possibly making the chassis bow on the bottom, but some car owners will inevitably choose the convenience of the strap! If the strap is your method of choice, don't set it up so you'll have to really tighten down the strap retaining nut, the black battery holders should do their job!

The T1FK'05 strap will work, according to XRAY racers online, just flip it 180 degrees from the way it's mounted in the '05. If you prefer to use tape, remember to file or carefully Dremel the slots that the tape passes through – all too often at club meetings you can spot a fully built battery laying on the track with a dead car nearby rolling to a stop, with the tape still wrapped around the top of the battery!

Topping off the car, literally, the choice was a Protoform Mazda 6 shell. This is a great all-

around performer at many tracks and is one of my top picks for racing shells, providing plenty of steering but and just enough rear grip for my driving style. Paint was done by Matt Saul, far better than I (or many other people!) could have done, do a Google search for 'Slikks' for his web site and see other fine examples.

FIRST IMPRESSION

Acceleration – the acceleration from the T2 is tremendous. With a very free-rolling drive train and a fresh battery pack, you'd be hard-pressed to find anyone who would say the T2 is slow! Of course the Nosram brushless system made it go like a rocketship, but even when I switched to a 19-turn motor for racing I was extremely impressed.

Steering –The T2 tracks like, well, like it's on rails, forgive the over-used cliché. Unlike shaft-drive cars the T2's mid-corner steering is not affected by blips of the throttle, nor by easing off the power. Compared to other belt-drive cars I've wheeled around a track the feeling is precise, inspiring confidence with its surefootedness. There was no squaring off of the corners, even with the stock springs the car is agile and nimble without being twitchy and over-responsive.

Maintenance – wrenching on your car is definitely one of the biggest ordeals that racers face. Even if a car works great on the track, if you have to rebuild a diff, swap an upright or change a belt it can take ages on some cars. With the T2 it's easier than you might expect – there's nothing else really to say! As mentioned above, six screws gets a diff or layshaft in your hands, and changing arms or front uprights is as easy as on other top-level cars.

Tuning changes – A few years ago no one had any idea what roll centre was, other than the car designers themselves, but now it's commonplace to change it. Good for us, then, that on the T2 it's a simple matter of changing the hinge pin mounts, four screws at each end. While you're at it, with those same four screws you can change the track width, arm angles, rear toe, anti-dive or anti-squat and a variety of other options. It doesn't take any more or less screws or time than with other top-level touring cars, but it is definitely easier. And the chassis stiffness? Also very easy to change around – add or remove screws and posts from the upper deck, also you can remove strategically placed screws from the front and rear bulkheads as well! During a race day as traction improves on the racing surface you can stiffen up the chassis all around the car or at just the front or rear.

No more experimenting with different inserts, air gaps, compounds, roll centre locations, springs, etc. Sorted! The ease of making changes to the car is definitely one of the major points of the car. Another is the thick Set Up Book included with the kit!

Durability – what can I say: the T2 is as durable as they come. While some racers worry about how fragile the plastic bits on the end of their suspension arms are, I can say with confidence you'll have very few worries on the T2. Like all XRAY TCs that came before it, the T2 is as solid as a rock! Worries about the thinner universal driveshafts are unfounded and the axle bolts didn't catch on anything during my test runs at my local indoor track. After a night of full-contact racing I dusted off the car and went over it after taking it apart for routine maintenance – nothing bent or broken, and at this track that's a very good sign indeed!

quickspec

CLASS: 1:10th 4WD Electronic Touring Car
TYPE: Self-assembly kit
MANUFACTURER: XRAY – www.teamxray.com
PRICE: £284.99

WHAT YOU GET

Full chassis kit, 4WD, twin-belt driven, rubber sealed ball races, rear pre-assembled ball differential, front XRAY Multi-Diff (full front one-way, front locked one-way or front spool), Hudy Spring Steel universal dogbones and turnbuckles, double deck carbon fibre chassis with XRAY Multi-Flex technology for various stiffness levels, carbon fibre upper deck and shock towers, alloy bulkheads and motor mount, fully adjustable suspension, oil filled coil over shock absorbers, race-tuned springs, single-bellcrank steering, clamp-style wheel hex adapters, adjustable body mounts, XRAY Starburst wheels

WHAT YOU NEED	WHAT WE USED
2 channel radio	KO Propo Helios radio
Receiver	Nosram Gemini 40 MHz receiver
Speed controller	Nosram Dominator Evolution speed
Steering servo	KO Propo PDS-2363 ICS Servo
Motor	Nosram Storm Brushless Motor 4 Star
Batteries	NR99622 VTEC SC3800UP P-Max batteries
Charger	Nosram Sirius charger
Paint	Pactra paint
Tyres	Nosram VTEC 24R pre-assembled tyres
Inserts	
Bodyshell	Protoform Mazda 6 bodyshell
CA glue	

LIKES

- ✓ Amazing build quality and finish
- ✓ Fully equipped with colour manual, set up sheets, recommended set ups, thick set up book, gear charts, rollout charts and more
- ✓ Everything you enjoyed about the T1FK'05 and better
- ✓ Cheaper than some other top of the range TC kits available
- ✓ The best after-sales support from the Team XRAY website

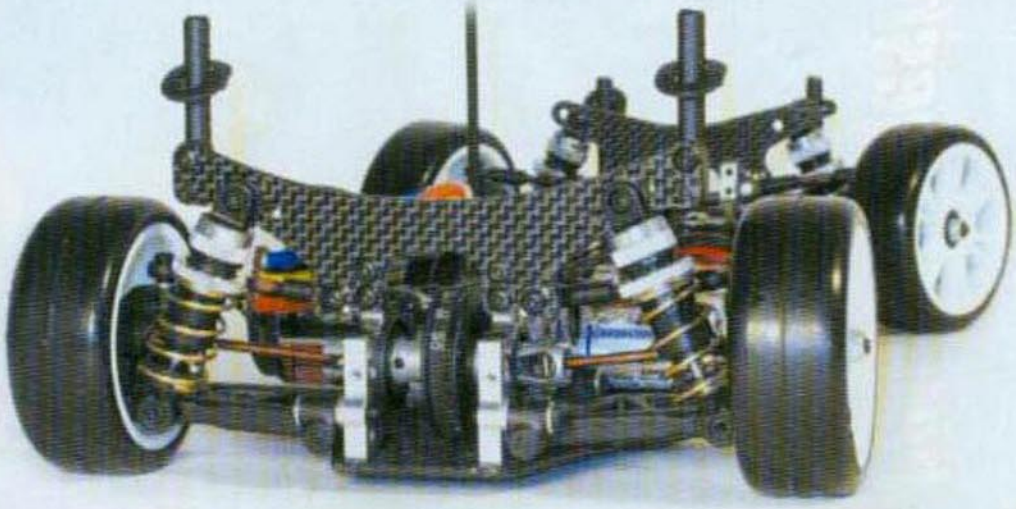
DISLIKES

- ✗ Released less than a year after the T1FK'05...but who cares, it's the new XRAY TC!

CONTACT DETAILS

Team XRAY, visit www.teamxray.com
Mirage RC Enterprises (UK distributor), telephone 01283 226 570 or visit www.mirageracing.com for local stockist information

Overall – During the build, whilst writing this review and running the car for its first few packs, I developed the impression that with the T2 XRAY has achieved what is, right now, possibly, the perfect electric touring car in the eyes of the Hudy clan: multiple systems on one chassis, designed to do multiple things very well. The Multi-Diff allows racers various drive combinations, using one device. The Multi-Flex system allows racers various chassis stiffness settings without using different thicknesses of chassis or upper deck. Even the shocks allow you to change the damping without taking them apart. You can't help but wonder: what are they going to come up with next?



VERDICT

If you've not already paid out for a top-end racing car to start off the new year, the T2 should be at or near the top of your list. Pry it away from a mate at the track and give it a go, you will certainly be impressed! Keep your eyes in RRCi for future long-term updates!

RRCi