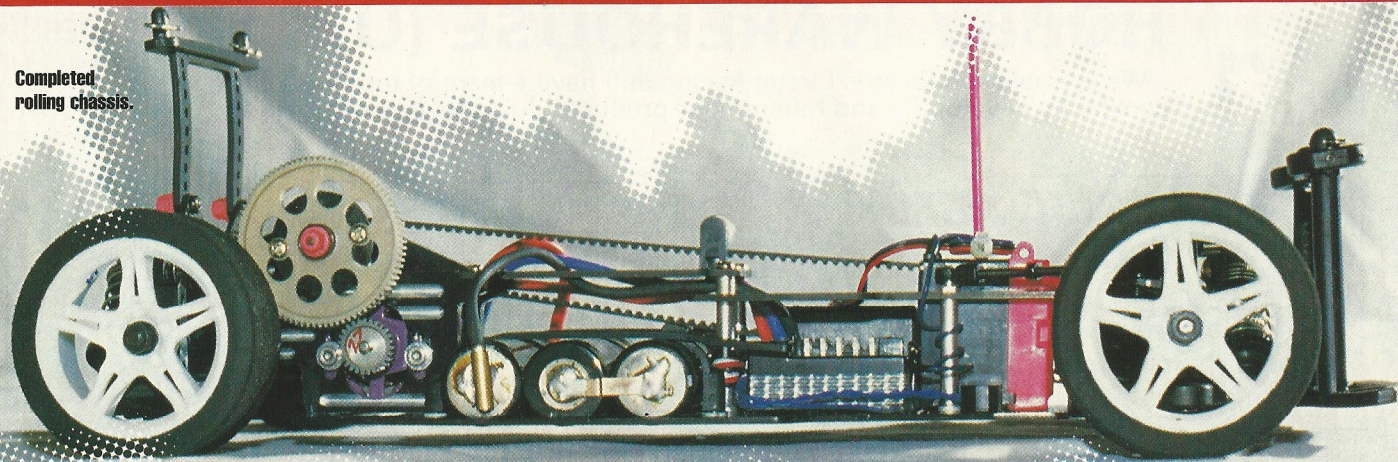


Completed rolling chassis.



Some time, late in 1995 M1 Racing quietly launched a new scale saloon on to the British market, a very brave move considering the competition from big name manufacturers such as Tamiya and Yokomo. Like many other cars in this class it too was very closely based on a four wheel drive buggy transmission with a shrunken wheelbase and width.

Soon enough a small racing team was established to showcase the car at race-meetings around the country. The Striker and its development, the Evo II, have since gone on to win the 1996 Radio Race Car On Road Championship and had first place finishes in the BRCA Winter Touring Car Championship. A capable car then, but why am I telling you all this? Well, with these successes and Evo II's becoming more widespread one could imagine the company would sit back and relax. On the contrary, development has continued apace,

resulting in this latest offering, the M1 Express. And a very impressive piece of kit it looks too!

There is nothing particularly radical about the M1 Express. It is a car that utilises the classical twin plate chassis and twin ball differential/twin belt 4wd transmission. It is by clever innovations in the execution of this very popular and successful design format that M1 have created a car with some unique features that set the car apart from the rest.

Chassis

The chassis is made from high quality carbon fibre and employs an unusual split top deck design. This appears to have been necessitated by the long reach and angle of the front drive belt. M1 have taken this potential weak spot and turned it around to become one of the car's strong points. At the junction of the two top plates they have included a pair of posts that

reach out to the baseplate. Complemented by another pair further forward these four stiffeners result in a chassis with incredible rigidity. On any car, the stiffer a chassis is the less likely it is to twist or deform under bump or cornering forces. This ensures that all the movement is confined to the suspension system which is controlled by springs and dampers, in turn the car should ride well and handle consistently.

This car is the first one I've seen that isn't based on a re-worked buggy. This model represents a unique opportunity for M1 to design a car specifically as a scale saloon, and tackle some of the problems usually attributed with the class. One of these is the lack of space available for radio installation. M1 have made some intelligent design decisions in their efforts to maximise interior space. The most obvious of these is they have dispensed with the belcrank and slave arm steering set-up and instead opted to mount the steering servo right up front - on end, ala typical formula one car. Wearing a servo saver, the servo is simply taped to the chassis baseplate and trapped, so that it cannot wobble, between the edges of the top deck. My servo was ever so slightly too tight a fit here, so a file was acquainted with the topdeck to rectify the situation. The light-

weight hot pink fet servo top is an after market part to fit KO servos made by M1 racing.

Ackerman and bump steer can be adjusted by utilising different holes in the servo saver which is not included as a standard item, instead allowing the builder to install one of their own choice. I chose a large Kimbrough one. The amount of space this leaves available for radio installation is more than adequate for almost any receiver and speedo combination. This car must be the only one in its class that can use a saddle pack configuration and still fit all its running gear on the baseplate without restricting access to the pinion and motor screws.

Slots for saddle packs are pre cut although plastic end straps for stick pack users are also included as a kit item. The chassis locates the cells very close together, keeping the largest part of the weight as close as possible to the cars centreline. This means that, at its widest, the chassis baseplate is only ten and a half centimetres wide. This will serve to maintain a useful ground clearance when the car rolls as it corners. In turn you can run the car very low which should further improve its handling. Unfortunately M1 intend you to secure saddlepack nicads with velcro straps.

Now this is fine, and works very well but personally I don't much like them as they protrude underneath the car by as much as a couple of millimetres, robbing the car of ground clearance which increases the likelihood of touching the floor during hard cornering. My solution, and first little modification, was to drill the chassis plate and fit a set of

Schumacher's excellent nicad straps (Incidentally I only had to drill the forward holes as the others are intended for installation of the stick pack nicad straps).

At race-meetings you can often find cars whose owners have extended hours of effort painstakingly cutting holes in their chassis parts, to reduce weight, improve access to other parts or just as an expression of individuality. Well, M1 have taken care of all that by removing high up weight (topdeck) and putting holes in the baseplate wherever access to a screw head might be required. Oh, and by the way, have you noticed those two holes, sticking out of the side of the front half of the topdeck? Any idea what they're for? Yes, M1 have even taken care of the transponder mount too!

Transmission

Again this is a fairly typical twin belt 4wd system with a free wheeling front end provided by a one way bearing in the layshaft, which incidentally is tubular to reduce rotating mass. Although the kit includes the free wheeling front end M1 racing also make a fixed layshaft which provides full time 4wd, available as an after market part.

Belt pitch is coarser than the Evo II, it sometimes has problems with debris clogging its pulleys. One unusual and really natty feature of the transmission is the plastic diff halves. Again these are really lightweight parts but were a source of concern to me as I inserted

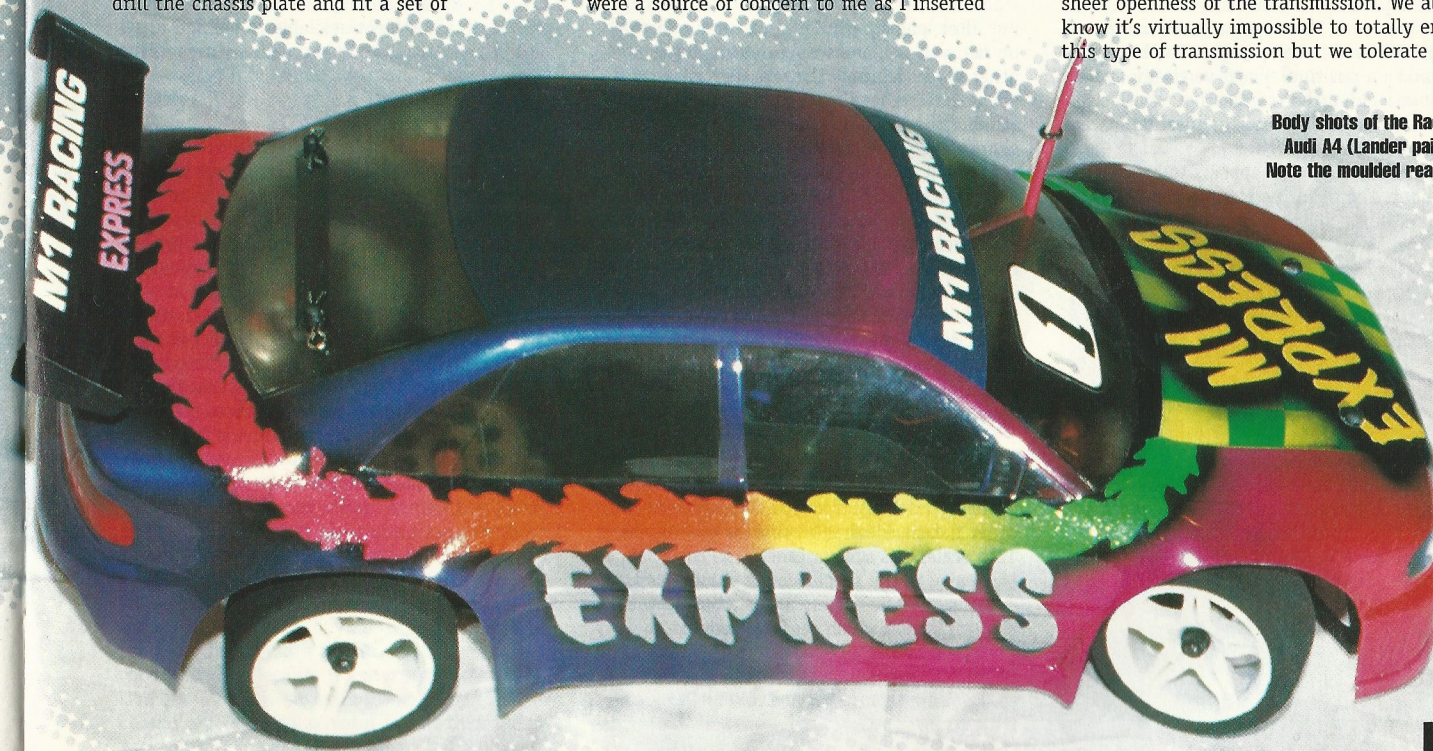
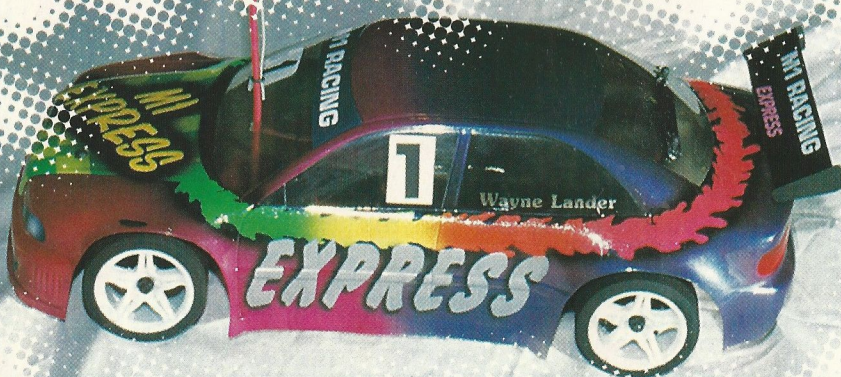


the dogbone end of the universally jointed driveshafts. I expected there to be a problem with accelerated wear here. I spoke to one of the team drivers who has experience with these diffs in his Evo II. He tells me, "On the contrary, there is very little wear because of the drive cups ability to flex and rebound rather than grind the contacting faces, dogbone wear is virtually eliminated too!" Over time the plastic drive cups can permanently deform by splaying at their outer ends so M1 have solved the problem by supplying some small plastic rings that can be glued on to prevent this from happening. Remember to use a contact adhesive like Evo stick to do this, I used super glue and then discovered I needed to detach them so I could remove the diff bearings for cleaning! Another source of concern for me was the sheer openness of the transmission. We all know it's virtually impossible to totally enclose this type of transmission but we tolerate small

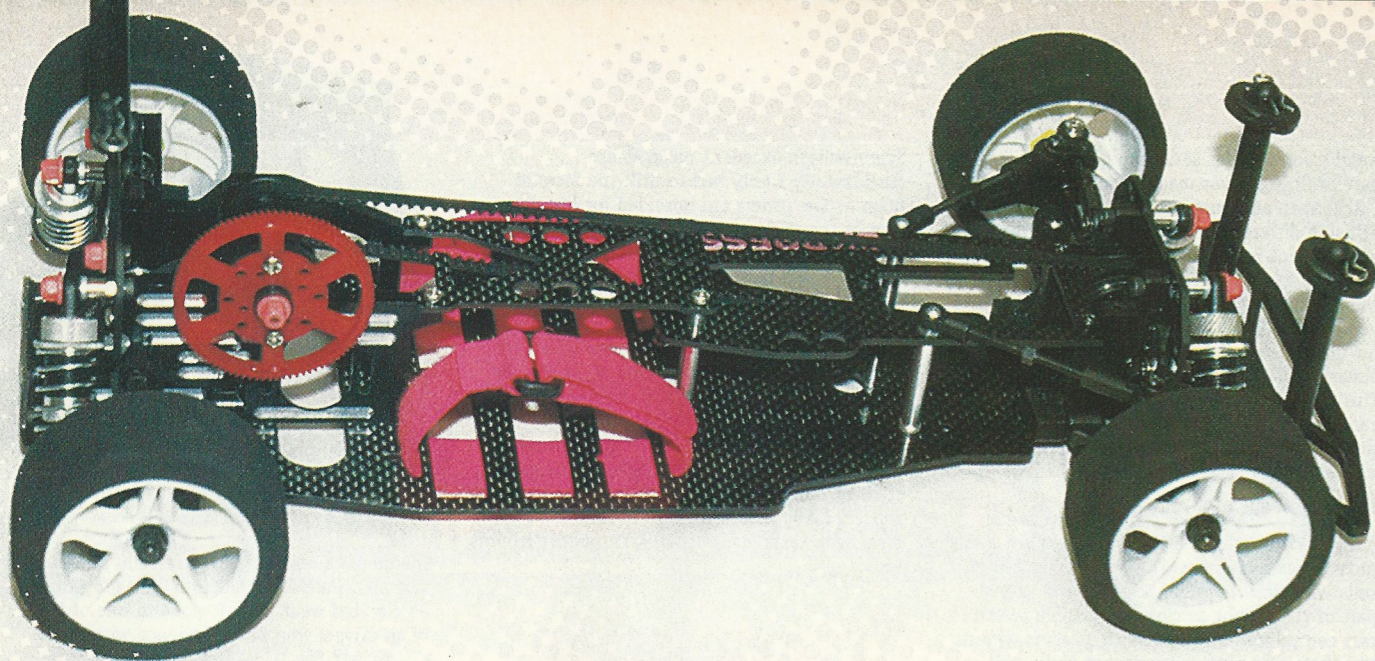
Body shots of the Racecraft Audi A4 (Lander paint job). Note the moulded rear wing.

M1 EXPRESS REVIEW

catching the express!



express!



openings in the hope that small stones and debris will only occasionally find their way inside, unfortunately when they do they quite often chew a belt or groove a diff pulley. M1 have decided the best way to prevent this while keeping the car as simple as possible is to let any foreign bodies that do find their way in, right back out again - hence the hole underneath the rear diff. This idea may have some credibility as I recently saw an American magazine article that advised YR4 owners to cut away the back portion of their rear transmission housing for exactly this reason.

Another space making element of the Express's design is how the rear gearbox, motor and layshaft have been arranged. The layshaft is located in a position almost vertically above the motor, making the rear gearbox relatively short thus encroaching into the interior space as little as possible.

All up the transmission appears to be very lightweight. The resulting low rotating mass will make the car quick to accelerate, decelerate and help the car to be responsive to throttle inputs and efficient on battery power. One noteworthy point is that there is no provision for adjustment to the tension of either drive belt.

Suspension

Yet again there are no major surprises in this department. The very popular and well-understood solid lower wishbone with a turnbuckle upper tie rod, controlled by a coil spring over oil filled shock absorber is used all round. It is again in the attention to detail that this car

has one or two special features that set it apart from the competition.

Rear

To begin at the rear there are these rather special composite hubcarriers; made in black anodised aluminium they have a balljoint bracket with a choice of mounting holes made from carbon fibre. They look super sexy and draw many a comment from onlookers at the track. For a long time I couldn't quite understand why M1 chose to make them this way but after lengthy pondering it finally dawned on me; you see, the suspension includes some other useful features that are not immediately apparent from looking. The left and right lower wishbones are identical and are therefore interchangeable which cuts down the number of spares you need to carry, this is the case with the front wishbones too. It wasn't until I crashed and broke a front steering knuckle that I realised that they too are side to side interchangeable - then I suddenly realised that if I ever managed to break a rear one I would be able to assemble a single hubcarrier to fit either side also.

Front

The front suspension is unique among scale saloon racers in that it incorporates a 'reactive' or 'rising rate' caster system. Widely used in other flat track formulas such as pro 10 and 12th scale, this system causes the caster angle to change as the suspension is compressed. The amount of static caster can be adjusted with the turnbuckle which reaches from the top of

Aluminium motor mount should keep motor running cool, also the motor is mounted very low in the chassis for better handling.

the knuckle to the chassis topdeck, the rate of caster change can be altered by raising and lowering the height of that topdeck mounted balljoint.

This system of caster adjustment needs a non typical layout at the outboard end of the front wishbone. The lower wishbone incorporates a rose joint whose ball is screwed directly to the bottom of the knuckle. The C shaped component commonly referred to as the caster block is dispensed with completely. I am still a little unaware of exactly what reactive caster technology can do for me; how to tune it to suit track conditions and my driving style, but it's one more adjustment available to me and one it'll be interesting to experiment with.

Shocks

The shock absorbers are of the plastic bodied variety with twin o-ring seals and a choice of one, two or three hole pistons with a rubber diaphragm volume compensator. All four are the same length. The really interesting bit about these shocks is the way that ride height is adjusted with spring tension. M1 have moulded the outside of the shock body to have a thread so that an aluminium spring locating ring will screw up and down to adjust spring tension. Neat! In the past I've heard of people not impressed by plastic shock absorbers. Despite the fact that plastic mouldings cannot yet achieve the minute engineering tolerances found in some aluminium types they still seem to work very smoothly when built, after all we are only experiencing relatively small undulations on-road and therefore I consider these shocks to be perfectly adequate and no disadvantage.

A Couple More Shocks

Upon completion of the car I undertook a bench test to check the cars electrical system and set up the trims before taking it out to race. One thing I noticed when I revved the motor was that the long belt would begin to oscillate alarmingly as I approached full throttle. Further checks indicated that the belt tension was fine, no slip occurring, but it was simply the sheer length of its reach that allowed this vibration to occur. To help stop this from happening so much I made a simple belt guidance device from a shortened servo mounting post and an old motor ballrace. It can be

seen in the photographs, perched upon the topdeck about half way along the belt. Its height is such that it does not touch the belt at standstill and because the vibration does not happen below about 80% throttle it will not touch the belt until nearly top speed. It's not an essential item, just one I feel better for having. I have since spoken to M1 racing who say the vibration does not occur when the transmission is under load - that is when the wheels are on the ground.

It wasn't until I took the car racing that I discovered the cars most annoying drawback. The car is supplied with a 92 tooth 48Dp spur gear and the transmission ratio is 2.13:1. This means it takes 2.13 revolutions of the spur gear, whatever its size, to rotate the wheels once. It's an important aspect of calculating roll out figures often known as mm per rev. When I take the car outdoors and onto the longer straights such as those found at Ashby I am not going to be able to gear high enough. No problem, I hear you say, just fit a smaller spur gear and use larger pinions.

Well, here's the situation. If I fit an 86 tooth spur the only pinions I can mesh with it are from 30 teeth upwards. Although the screw slots are very long there is a recess cut into the back of the motor mounting side plate that stops the motor moving any closer to the spur than shown on the photograph. I do however have the luxury of using any of the four screw holes found in the motor can. I could try to modify the motor mount to allow the motor to move closer but if I do it will rub on the drive belts. A call to RW racing indicated that the largest pinion they make is 33 teeth. I sat down with my calculator... Bearing in mind my foam tyres will still be usable right down to 57 mm diameter, it tells me that if I use an 86 tooth spur and I want to use a mild motor such as a 15 turn I am likely to require pinions right through to 40 teeth! They just don't make em! What am I to do?

I think the problem stems from the fact that the eastern countries along with the other particularly large R/C market only run scale saloons on rubber tyres. They have a diameter somewhere up in the 67 millimetre range and this is what the car has been designed to gear for. But that doesn't help me does it?

Another criticism I could point at the car would be aimed at the instruction manual. It takes the form of a sequence of exploded diagrams along with boxes describing the parts used at each stage - and that's all! There is no indication as to where to look for the parts just as there are no words describing the assembly. This is done so that the kit has no language and therefore the same document can be used worldwide. Personally I think that most of the customers who would be buying this kit are the type who have built a similar one before and chose this one because it's a race bred competition car. I'd much rather have the carbon fibre chassis and aluminium motor mount than pretty packaging and a full colour instruction booklet.

Ready to run and including bodyshell the car weighed in at just 1350 gram! This is 150g under the BRCA minimum weight limit. Boy oh boy you should feel how heavy 150g feels in your hand! This makes this car the lightest on the market and remembering that weight limits are not enforced at most club level meetings I feel this will give me a definite advantage. When I do have to add weight I can put it wherever I want within the car. I've used it to alter the cars handling characteristics by moving it forward and backward; I can put it all in the middle of the car for quick handling or down the sides for maximum grip. It's just one more adjustment I've been given to experiment with.

Car Setup	Rear	Front	Motor	Other
Spring	Kit(Silver)	Schumacher S24	13x2	8 deg caster
Damper oil	30 wt	80 wt	92 spur	1' toe in
Piston	1 hole	1hole	27 pinion	Kit Tyres

Most scale saloons claim to be suitable for use with any wheel from any manufacturer. While this is largely true I have noticed that different manufacturers' wheels have differing amounts of off-set built into the moulding. While this is not a problem for some people it can have the unfortunate effect of making the car too wide for racing within the rules. M1 have addressed this problem by offering wheel drive hexagons in three different widths. Although they are not a kit item I can strongly recommend them as they should ensure that I can use any of my existing scale saloon wheels with the Express. A slot in the back of the hex locates on a pin through the stub axle meaning they may be suitable for installation on some other makes of car.

How does it go?

The cars first meeting was a weeknight at my local club in Derby. The car was used at its built up weight with the kit supplied foam tyres, which I would describe as a hard blue compound. Previously I had taken the time to true them down to the BRCA maximum width of 26 mm. The car felt very good - if a little oversteery. I ran the car with the supplied springs and I consider the fronts to be a little too soft for the relatively high grip levels achieved with foam tyres. Changing to some harder front springs for the second round made the car turn more to my liking.

The car felt very nimble, no doubt as a product of its very lightweight, and sounded almost silent - only the whirring of the BRM 13 triple motor being audible. In the final round I had an altercation with a track marker on the inside of the second corner. I noticed the inside front wheel was adopting some very strange angles and so I pulled the car off to investigate the problem. It seemed impossible to me but I had broken the aforementioned steering knuckle and my race was over.

By the second race-meeting a replacement knuckle had been acquired and a foam front bumper fitted to minimise the chances of the same thing happening again. This time the meeting was a round of the Radio Race Car indoor series being run on carpet alongside the 12th scale nationals. For this meeting the car was weighted up using more than two of those lead strips used to balance full size alloy car wheels! To my delight the car handled equally well from the first time I put it on the track. I did not feel the need to adjust the set-up throughout qualifying, by the end of which I had

Reviewers Kit

Speedo	LRP ICS
Motor	BRM 13x2
Cells	M1 1700 scrc
Radio	Futaba FF3
Bodyshell	Racecraft Audi A4

set FTD! A brain fade in the first lap of the final resulted in a third place finish but I had enjoyed my day and I was thoroughly impressed with the speed and handling of the car.

What you get for your money?

What you get is a well sorted, race bred competition saloon car of outstanding quality. The cars standard specification is very high, so high it manages to embarrass some of the competition. The kit box does not contain a bodyshell but your choice of any one from the excellent Racecraft range is included in the price. The car is available in two versions the lower spec car has a plastic motor mount while maintaining the one way bearing and carbon fibre chassis components. **RRCI**

Stop Press

4wd EXPRESS wins 1996 ROAR On Road Nationals in USA.
Standard motors - Positions 1 to 5 are Express
6 of the top ten are Express mounted
Tim Bump, winner
Modified Motor - Tim Bump, winner
7 of the top ten are Express mounted

