

A new 1/8th scale 4WD off-road racer

P.B. Buxy

If its ultimate speed and excitement you want from your off-road 1/8th scale racing, and you are prepared to pay the price, then 4 wheel drive is the way to race. Inevitably the cost is greater, the extra transmission parts to carry the drive to both front and rear wheels and the possibility of up to three differentials being fitted says it all. Cost of the 'Buxy' is, in spite of the 4WD complications, very moderate when compared with the rest of the field and specification has not been trimmed down to achieve it.

Probably a large factor in the cost reduction is the choice of a unique toothed belt system to transmit drive from the rear mounted gear box to the front wheels. Cost paring does not extend to the steel drive gears, metal-cased front and rear differentials, assymetric dampers for the rear suspension and full ball-raced moving parts. The 'Buxy' is based around a classic twin rail 'ladder' style chassis with aluminium alloy sheet 'rungs' to which the drive components engine and R/C crate are fitted.

Suspension is the popular off-road choice, trailing arms. Double trailing arms to the front with hairpin style springing and hefty single rear arms with cantilever operated coil over damper springing. Power is supplied by a longitudinally-mounted 0.21cu. in. motor driving a short lay-shaft with steel bevel gear drive to the rear differential. A disc brake is fitted inside the gear box which acts on the lay shaft. Apart from the toothed belt drive, the next most striking feature of the 'Buxy' is the angled engine with cylinder head tilted to one side. This serves to provide a better line for the exhaust system and allows the engine centre line to be moved nearer to the car centre line, giving a little more leeway for alternate gear ratio fitting.

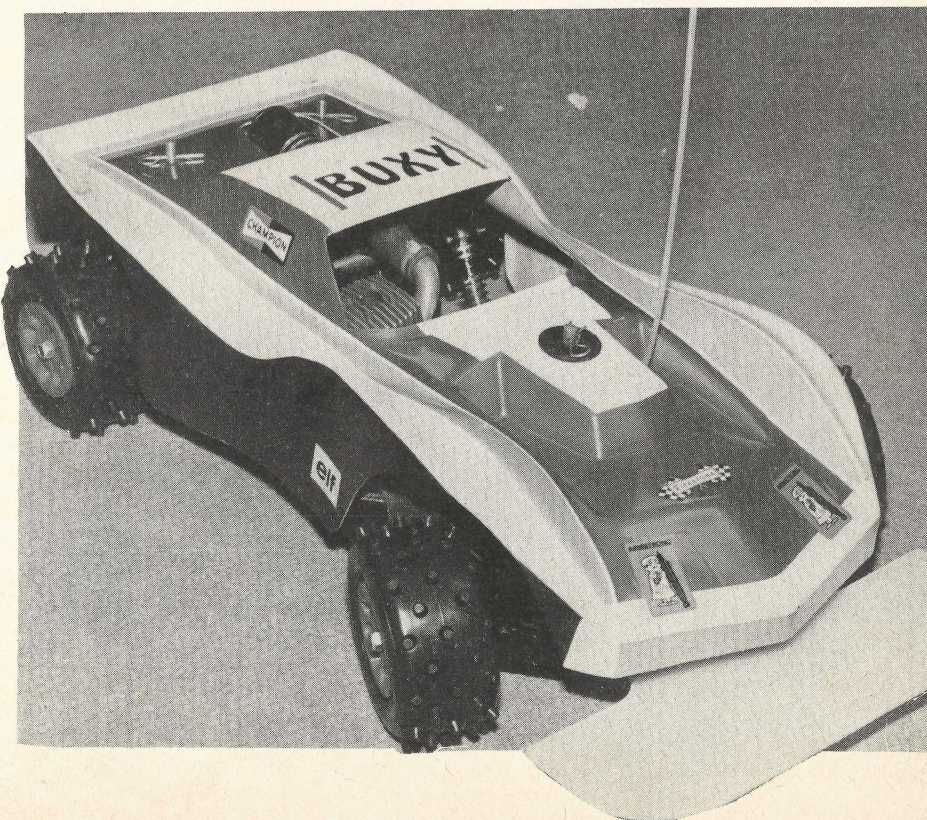
The clutch supplied is a PTFE shoe-equipped 'universal' style with neoprene 'O' ring springing for the two shoes. A needle roller bearing supports the toothed steel clutch bell which drives straight onto the steel gear fitted to the layshaft. More on the engine fitting later.

As is normal, the 'Buxy' is designed for 2 function R/C equipment, the vacuum formed plastic crate is adequate in size for virtually anything in the way of servos, receiver and battery pack that a prospective builder might have to hand. So much for the concept, down to brass tacks.

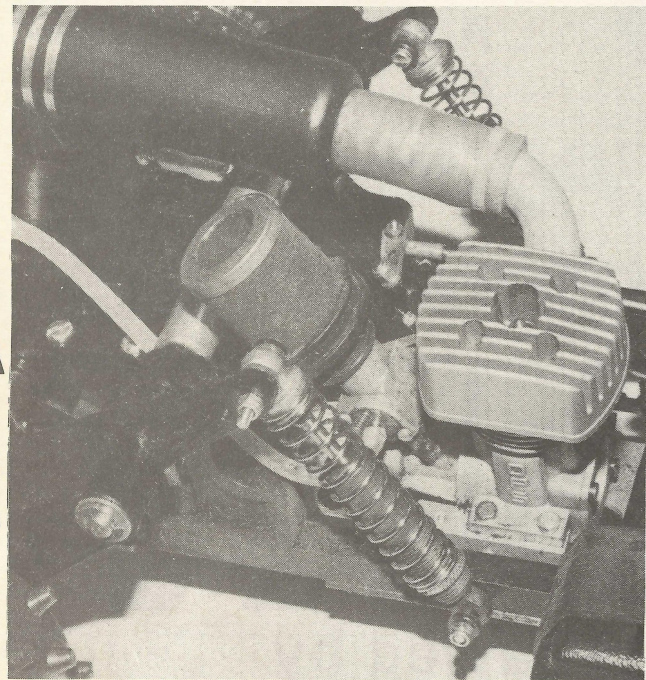
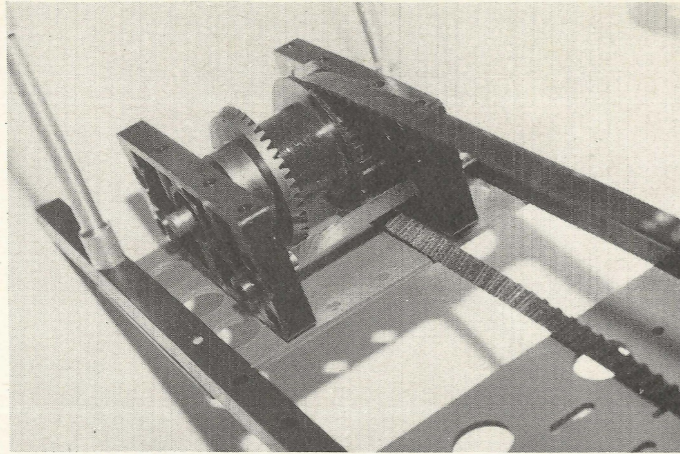
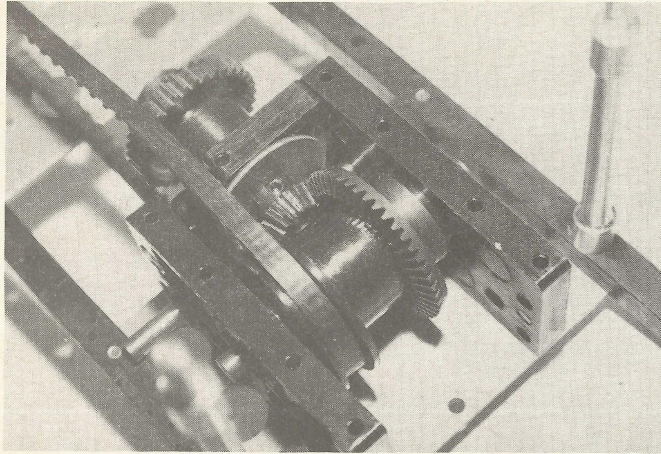
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Reviewed by **Bill Burkinshaw**



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Above left: steel layshaft and bevel gears are included as standard in the Buxy kit. Note the fully enclosed brake assembly. All shafts etc., are ball-race mounted. Above right: drive from the front to rear is by toothed belt, tension is important and adjustment is made by sliding the front differential. Left: OPS motor fitted with a PB carb fitted in nicely, other slide carbs can be tricky! Below: vac. formed r/c crate is large enough for any make of equipment but needs careful trimming.

Assembling the 'Buxy'

Most parts are vacuum packed onto stiff card with transparent plastic in the usual sub-assembly packs. A large exploded view diagram forms the main aid to assembly and is backed up by a set of notes which help to clarify some detail areas. I have to say right now that even with the experience of several years of assembling R/C car and helicopter

models, I found some areas inadequately covered by these instructions and difficult to fully understand.

The main areas present no difficulties, suspension and drive parts fitted together well, but R/C fitting, brake assembly and silencer fitting were not detailed enough.

Both differentials are already assembled but the slots in the output shafts benefit from

a cleaning up using a grinding disc fitted to a Dremel style power tool. The only other item requiring 'fitting' was the steel brake disc which needs a thorough de-burring so that it will float freely on the flats on the lay shaft bevel gear boss. I did not realise that the disc had to be fitted to the bevel gear until I had assembled the gear box then had to take it all to pieces again!

Thread locking compound is a must on the various grub-screws throughout the drive train, as is the correct use of the shims provided for setting up minimal end float on the lay shaft and differentials. It may be necessary to squeeze the bearings fully into the front steering blocks as well, mine were not fully pressed home preventing me from fitting the bronze thrust washers behind the front wheel drive pins. These pins, are a very tight fit and must be squeezed in carefully using a vice. Don't hammer them in, they will either enter the holes out of line or you will mark the wheel spindles!

Once assembled both front and rear suspension units with drive shafts and steering fitted work remarkably freely considering the number of moving parts involved.

Engine Fitting

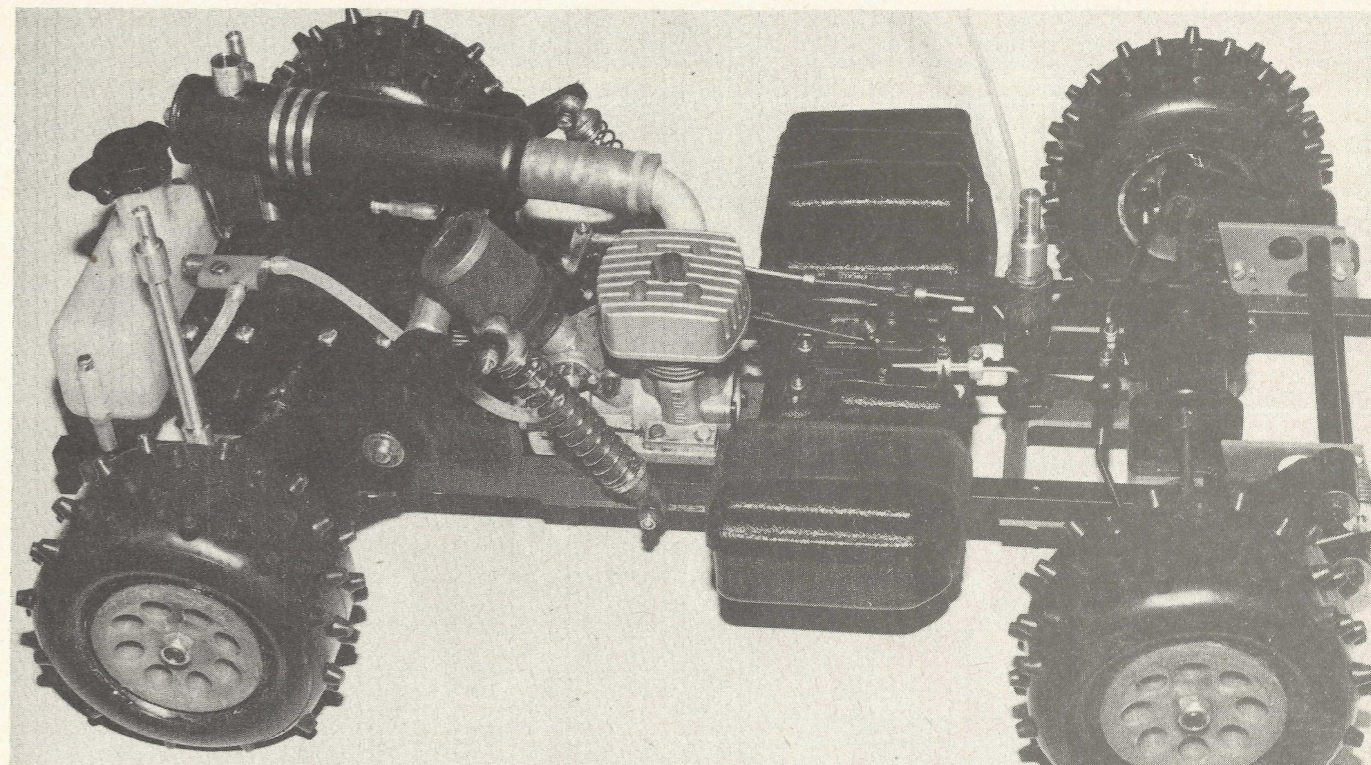
I chose to fit an OPS 21 side exhaust motor and as this was already fitted with a P.B. clamp-on clutch I retained this, if only for the reason that it saved time. The universal unit works perfectly well and should not be thought of as an inferior item. Fitting this clutch necessitates a modification to the engine mount plate. A notch needs to be filed out to clear the thicker clamp-on flywheel.

The angled engine blocks are not difficult to fit, just needing a little extra care. Fit them to the mount plate and offer up the engine with clutch in place and slide blocks and engine around until the clutch meshes nicely with the layshaft gear. Mark through the engine lugs onto the top face of the blocks and then remove the engine.

Centre punch the blocks for drilling, then replace the engine and sight down the holes to make sure everything lines up. The secret of drilling the angled holes into the blocks is to angle the blocks and drill straight.

It will be necessary to tap the blocks with a suitable thread — 5 or 6 BA. Use paraffin as a cutting lubricant while cutting the threads. Once the engine is fitted to the blocks place a sheet of medium grade emery cloth onto a flat, hard surface and rub the blocks back and forth to flatten their mounting surfaces. Use a thread locking compound on the mounting blocks.

Initially I fitted an OPS slide carburettor to



the motor but once properly fitted it was obvious that this was not suitable. The problem was that the slide fouled the damper/spring assembly and the needle valve nearly touched the toothed drive belt. Either a barrel style carburettor or slide such as H.P. (incorporates a bellcrank) or P.B. will fit perfectly with no problems. I chose to use the P.B. unit and fitted this to the engine accordingly.

R/C Installation

Once all the major mechanical parts are fitted the R/C equipment begged to be installed inside the vacuum formed crate provided. A full complement of servo mounting hardware was included in the kit but, totally contrary to my usual practice with 'Track Tests', I chose to amend the manufacturer's method so that instead of the vacuum formed crate actually supporting the servos, the crate only protected them. To do this I fitted a pair of hardwood beams across the crate using the crate fixing screws to hold both beams and crate in position. To these I screwed a moulded plastic servo tray. Servos are thus very solidly mounted and the plastic box is not overstressed. Trimming the crate lids to clear the servo output arms and pushrods is a work of art, and I am afraid I gave up and removed wholesale a large chunk of the lid. Linkages to steering, throttle and brake are quite straightforward, but using the mass of collets, springs etc, provided for the throttle and brake over-rides stretches the imagination. It is not that there is insufficient material, just no indication as to how it should be used.

Finishing Touches

Once the R/C installation is complete, the fuel tank, silencer, bumpers, bodyshell and wheels are all that remain to be tackled. The silencer and fixing hardware is included. For the OPS engine, an SG 'Colombia' manifold turned upside down makes a very suitable item and with the aid of a short length of aluminium tube and a suitable piece of silicone tube, the silencer can soon be fitted up. A wire mounting leg for the rear of the

silencer is provided, this can be slipped under one of the gearbox lid fixing crews to support the silencer. Fuel tank fits to the extreme rear end of the car and it is not a bad idea to support the necessary long length of fuel tube using tie-wraps so that it cannot catch up in any moving parts.

Body shell trimming is simple, the ABS 'Corvette' body supplied is already marked for drilling positions for body posts and wheel arches. One little point is that the early kits may contain factory modified chassis rails which have been re-drilled to move the front suspension forward. Check before cutting out otherwise you may trim the bodyshell incorrectly for the front wheel arches.

Fitting wheels to tyres is a messy business but worth taking time and trouble to do properly. I use impact adhesive to fit lengths of cycle inner tube over the roughened up hubs, then cyanocrylate the tyres, also roughened up, to the rubber covered hubs. This method really does seem to work well and to date I haven't lost a tyre using this approach.

On the Track

I have mentioned the importance of ensuring free movement of drive shafts in the drive sockets already and even so, a slight notchiness was still present in the drive train so I started up the engine with the car up on blocks for a short running in session before running the car on the track. With the engine on fast tick-over I moved each suspension unit up and down a few times and operated the steering until the notchiness disappeared and all was free. With the engine by now warmed up, the time arrived to put the 'Buxy' to the test.

Buxy on the Track

There is no doubt that the trailing arm style of suspension really soaks up the bumps, the Buxy glides over lumps and bumps remaining very easy to control the whole time. Having been used to a lightweight two wheel drive car, I found the 'Buxy' a mite sluggish off the mark, its extra weight working against it, but even if initial acceleration is lower, top speed is unaffected and when one considers how

Above: once assembled and ready to run the Buxy looks very smart in a combination of black and gold parts. Wheels are a sensible design with outer flanges which help to retain the tyres.

the power can be kept on, actual ground covered in a given time is greater.

Steering power is lower than the wheel drive cars, actual lock is limited by the drive arrangements to the front wheels but with the tyres fitted actual cornering ability is very good. Sufficient lock is available for the tightest corner likely to be encountered. I did notice that with the car up on blocks during initial engine setting up, there was a tendency for the front wheels to straighten up as the throttle was opened. I believe this is not uncommon with four wheel drive cars and steering servo saver spring tension is critical in this respect. I eventually pre-loaded the spring a little more which helped considerably and also put some small pieces of rubber foam into the output shafts of the front differential to make certain that the shafts stayed really well into the front wheel spindles.

The gear ratio supplied I felt to be a little low for longer circuits but a wide range of alternative ratio clutch bells is available from PB Racing.

Conclusion

An interesting departure from the chain or shaft driven four wheel drive car for an attractive price. Initial notchiness in the drive train disappeared within minutes of the car being run. General quality and fit of the parts was good, there were no parts that didn't fit! The fully ball-raced drive system is rugged, steel gears throughout should ensure a long life particularly as the expensive bevel gears are fully enclosed. Instructions are only average, particularly with respect to R/C installation. Overall I feel that this car represents good value for money and should perform well. I note that a Buxy finished fifth in the French National Championships Final recently in competition with the already well-established Yankees and Micro Racing buggies. It certainly has winning potential.

Price: £198.64.