

KYOSHO ULTIMA OFF-ROAD RACER

by Chris Young



2WD World Champion:

When I first saw the **Ultima**, which appeared on the Australian scene very quietly in late 1986, most probably overshadowed by the launch of the Turbo Optima, my inclination was to dismiss the car as being only a lightweight fun car. But the Ultima is a classic 'wolf in sheep's clothing'. Designed by racers for racers, the Kyosho Ultima is the ultimate 2WD performer. The Ultima's super light, super durable, monocoque aluminium frame decreases weight and increases durability.

The Ultima's many stock features include: four oil-filled Kyosho shocks to smooth out rough terrain; low-profile, pin spike tyres on Schumacher CAT size, low profile wheels; and a clear Lexan body with an aerodynamic wing for stability. The special formula EX-66 glass-filled, nylon, double-wishbone suspension used in Kyosho's 4WD champion Turbo Optima has been adapted and improved for the Ultima, making it a virtually unbeatable racing buggy. Notwithstanding, the Ultima is eminently suitable for the novice, both to build and drive. For the more advanced driver the car can be easily modified to become a race winner at the highest possible level. And a winner the Ultima really is, taking out the first three places in the 1987 World Championships.

The Ultima will always be compared with Associated's RC10. Based on external appearance it looks quite a different car, but when you study the Ultima closely, it is apparent that Kyosho have designed, with little fuss and fanfare, an amazingly versatile 2WD which has a wheelbase identical to the RC10 and look-alike suspension geometry. The Ultima's advantage is in its longer suspension arms, which enhance its handling, and in its lighter weight.

I have previously described the Kyosho's 'hot-up' mods for the Ultima (*Dirt & Track* No. 2, pages 30 & 31). This time I will go back to basics

and describe construction of the Ultima straight out of the box, with as much useful information for the novice as possible. In this way a lot more satisfied drivers should be able to hit the campaign trail in the 1988 season, with less of the frustrations so common for those without any previous experience in building and driving a new buggy.

PACKAGING & INSTRUCTIONS

The kit comes extremely well presented, and parts are beautifully packaged in separate plastic bags. A Mabuchi 540 stock motor is supplied, but Kyosho Le Mans 'Hot-up' motors can be installed for race-winning performance. Not supplied are a 2 channel radio and 6 cell, 1200 mAh battery and charger. Apart from a few drops of super glue and a small can of Holt's touch-up spray paint, there is nothing else needed to get the buggy onto the race track. Instructions are copious, with only the occasional word mis-spelled in translation. On pages 30 to 32 of the instruction manual are scale diagrams of all bolts, washers, screws, etc. It is important to use this chart carefully. Kyosho obviously want you to become familiar with all the packets of screws and bolts early on, because you continually have to go from packet to packet to obtain the required fittings for the various construction steps!

GEARBOX and REAR SUSPENSION

Parts are well finished of quality materials, as is expected of Kyosho. Suspension arms, for example, are constructed of the same hard nylon used for the gearbox, and are virtually bullet proof.

Assembly of the differential is straightforward, although it is wise to check the die cast gears for casting burrs. If any are found they can be

removed with a Stanley knife. Be sure to fit the nylon gear case with the inner flat surface against the rear of the sun wheels. If you find, after assembly, that there is undue roughness inside the diff, the die cast sun wheels can be lapped using fine valve-grinding paste and spinning with an electric drill. But, unless everything is thoroughly cleaned after this treatment, the diff will soon be useless; so be careful! Production clearances for the bushes are a little wide; fitting optional ball bearings is recommended. If you do decide to fit ball bearings, this should be done during initial assembly. Once there is any wear on the shafts and axles they will be too sloppy if ball bearings are fitted.

Work the half shafts onto the diff carefully, making sure that the spacing washer is properly centred. Then tighten the grub screw fully and lock with thread cement. Do not grease the swing shafts as shown on page 7 of the instructions; this only allows dirt to collect which causes more rapid wear than in a dry, loose fitting.

Warning! Bolts and screws that are set into plastic should not be over tightened; there is probably no single more important factor than the care required in assembling plastic parts.

Here is a hint for setting up the gearbox as shown on page 18 of the instructions. In every Ultima that I have constructed the centre gear is positioned a fraction too close to the counter gear, giving, in my opinion, insufficient backlash. This is easily remedied by drilling out the hole for the centre gear's mounting shaft to 9/64 inch, and tightening the shaft firmly, as far away from the counter gear as possible. Finally, the centre gear is best positioned with both M4

washers on the inside, not on each side as shown.

Parts will now fit together with ease, and they really do fit smoothly. Assembly of the rear and front suspension is rapid, utilising shafts and E clips, indicative of the ease of replacement should repairs be needed during a race meeting, although this has not happened to me in a full year of racing the Ultima.

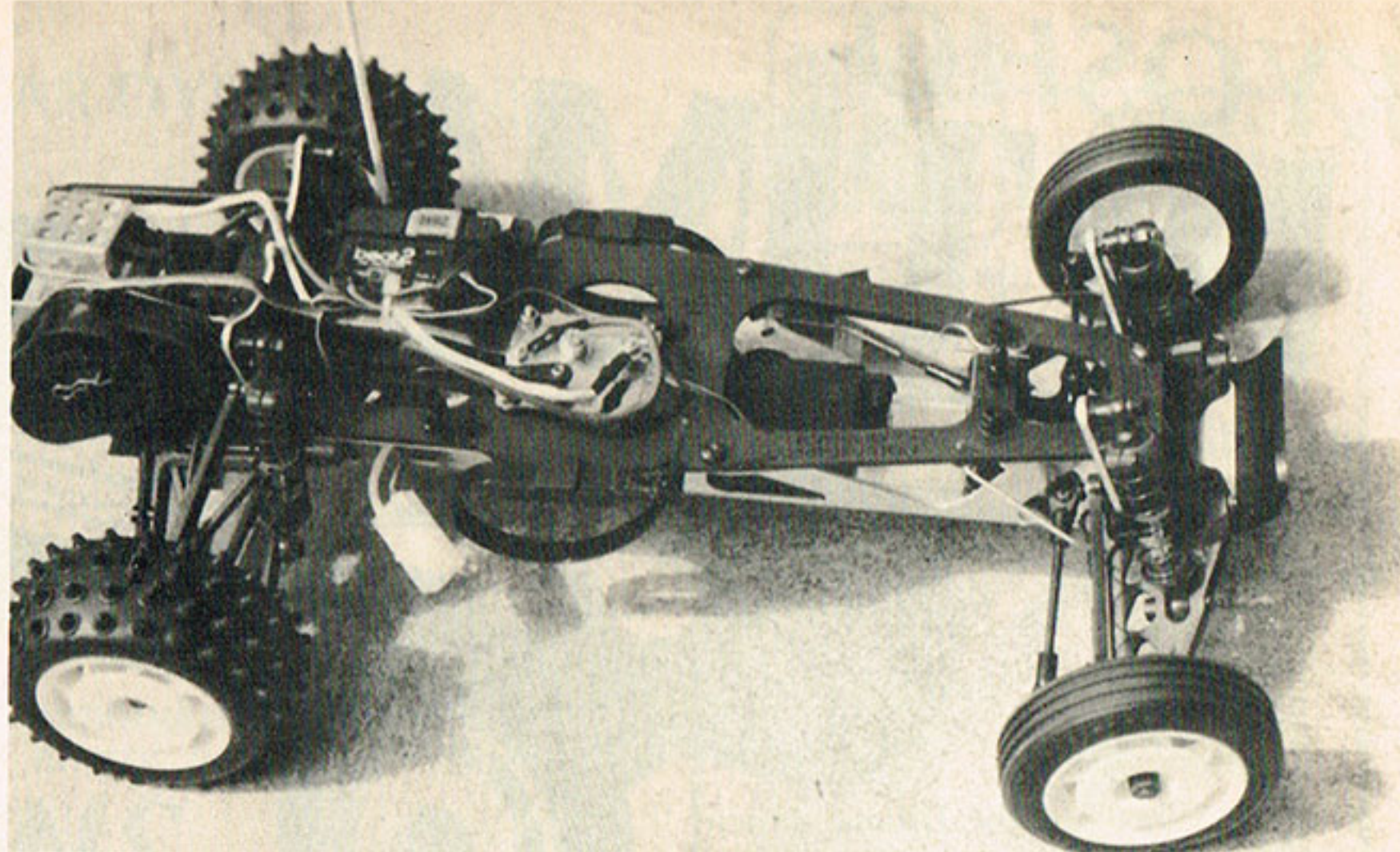
Skip the shocks at this stage; they can be assembled last. Take care with the front knuckle arm and king pin assembly. If there is any slop at all here, try a touch of super glue to locate the knuckle arm tightly. Of all the parts in the Ultima, it is only this assembly that seems to be prone to rapid wear. When assembling the tie rod ends, be sure to advance the ends equally onto the shaft, otherwise, if one end gets too tight, it will distort and bind onto the pivot ball.

STEERING and SPEED CONTROLLER

This is the time to get all the components of your radio gear together and check that everything is functioning correctly. I use a JR Beat 2 channel set with NES-505 servos.

Switch on and centre all trims. It is important that the servos are switched off in their neutral position before assembly, as it's a slow job to reach the speed control servo once it's in position. I prefer to mount servos with a little give, and used small rubber grommets around the mounting screws.

To make the car easier to steer, the ball nut in the servo saver should be fitted in the centre or outer hole, not the inner one as shown. Use the longest threaded rod, and spend some time with a heavy screwdriver, a hammer and a bench vise to get the



Suspension utilises the independent swing arm system, with the suspension and the radio plate mounted on the pressed alloy chassis.

S bend to fit smoothly in the servo horn. Mount the servo as far back as possible for a smooth throw, and make sure that there is no binding between servo and steering arm.

The speed controller is assembled as per instructions. It is similar to the Optima's speed controller, which is well proven, and has silver contacts for long life. For convenience, unsolder the wires from the motor and mark +ve and -ve for later. The M 2.6 x 6 bolt through the centre of the speed controller should be located with super glue. Fit the motor wires in a curve around the speed control horn as shown, and don't cut the wires short, as the extra length helps in the smooth functioning of the controller. You will need to cut the battery connection of your radio switch and solder to the regulator (diode). This diode gives a regulated supply for the receiver and the servos. A little heat shrink tubing can then give a professional finish to your

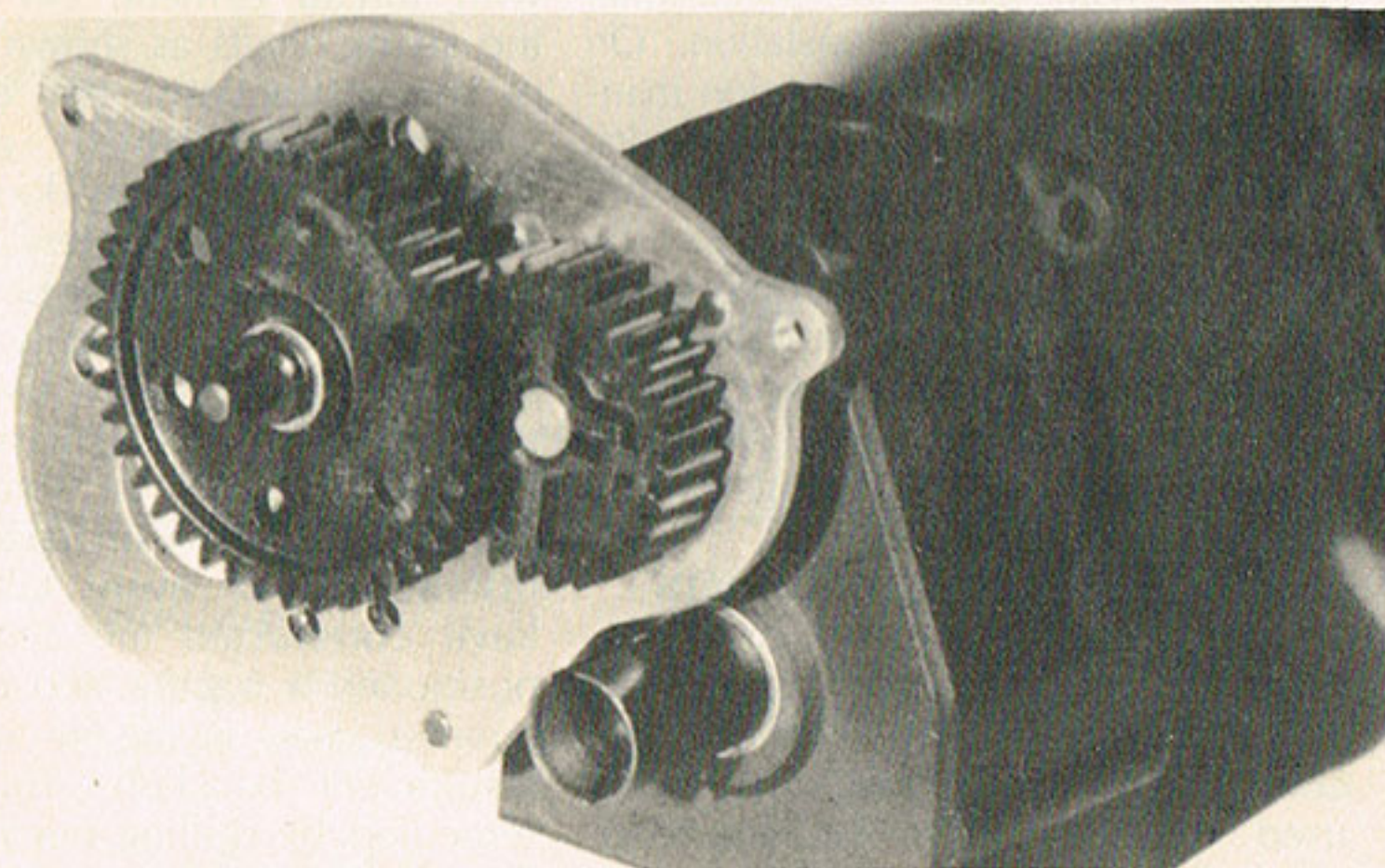
soldered joins. If you accidentally attach your battery with the wrong polarity, the regulator diode will die immediately — so be warned.

Fitting the speed control servo is not easy, but have patience: follow the instructions and it will all fit together. Remember that the connecting rod must fit smoothly; close enough is not good enough! A servo horn with 12 mm throw, not 15 mm as shown, will give full movement on the speed controller with the NES-505 servo.

FINISHING OFF

Filling the shock absorbers with oil is even more simple than shown in the instructions. I fitted the nylon cap seal without taking the piston apart, and filled the shock body up to the level of the mark just below the threads. Simply let the piston sink down into the oil under its own weight till the threaded end settles into the shock body, and tighten carefully. Watch in case the shock seal doesn't seat properly. To reduce the chance of damage I would use a Phillips screwdriver of similar diameter to the end of the shock body instead of the Allen key shown in the instruction book.

Mount the radio plate, taking care not to pinch any wires etc. To simplify attachment of the body, don't use the 'body stoppers'. Replace with a small bolt and nut as for adjoining parts of the plate. This also saves drilling holes in the lower part of the Lexan body where it is easily torn. Use a 5 mm drill for the front location hole in the body. Assembly of the roll cage looks complicated, but is straightforward due to the excellent instructions.



The motor mounting plate, transfer gears and differential are a single unit. The large central idler gear can be ball-raced, although this is an option. Another optional ball-race set can be used in the gearbox itself.

