

MARDAVE

MINI STOCK

Assembly is similar to the Mk 11 racing car and instructions for this are enclosed for guidance. Differences are as follows;

The 4 cell battery pack is fitted across the chassis in front of the motor.

The front and rear bumpers are supported by dural plates. The front plate is already fitted to the chassis. The rear is attached on the chassis with two 3mm x 6 machine screws.

The front bumper should be marked out, drilled and filed to shape. Bumpers are attached by 3mm x 12 machine screws with rubber spacers and nyloc nuts.

Because of the small size of the car, it is necessary to position all components on the chassis with care or there will not be sufficient space.

After assembly of the rear axle bearing blocks, motor and wheels, it is recommended that all remaining items be positioned loosely on the chassis to check positions before fixing. The battery should be located within 1.5mm of the motor. If the speed control servo is then positioned touching the battery, there should be enough space left for the steering servo.

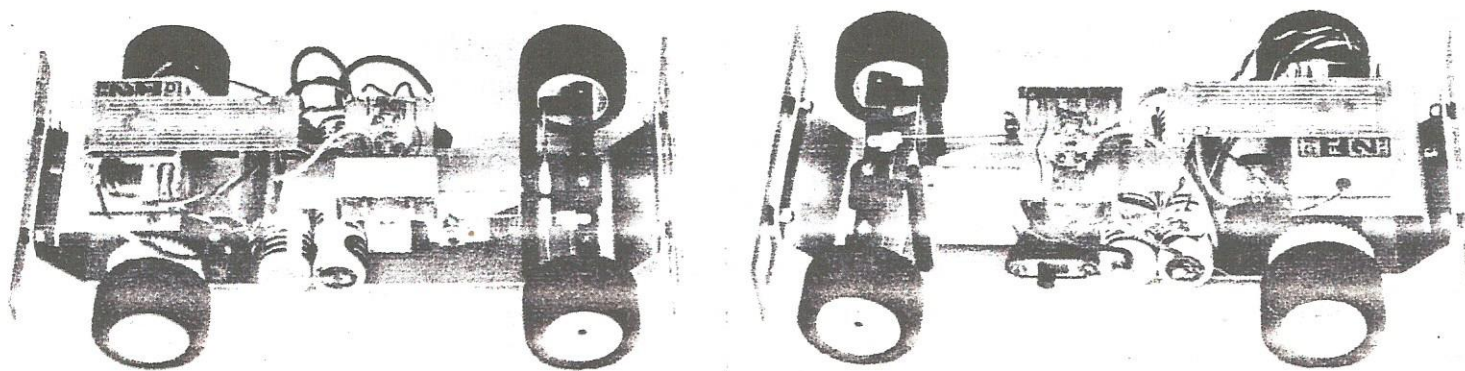
Also because of the small size, it is easier and cheaper to operate the car radio gear from the 4 cell motor battery. Space could undoubtedly be found for a separate battery however if desired.

To connect to the motor battery, fix the switch in the position shown using adhesive tape, remove the plug from the switch to battery lead and solder the wires to either side of the speed control board near to the battery connections.

Attach the receiver mounting plate across the rear axle bearing blocks using 9mm long self tap screws. Fix the battery, receiver, both servos, switch and aerial with double sided adhesive tape.

A printed circuit aerial board is supplied. The receiver aerial must be cut (or taped into a neat coil) and soldered to it. Alternatively the aerial can be rigged back and forth inside the car or a whip aerial can be fitted.

Body Fitting Trim the body to the lines etched on it. Cut, drill and file window apertures. Drill three holes 5mm diam. where indicated, to suit body mounting studs and pillars. Assemble the two front mounting pillars to the chassis with 12mm long self tap screws and with two brass packing washers beneath them. Fit steel rear stud to plate with 4BA nut. Cut window mesh to shape and bond in place with impact adhesive. Celulose aerosol paints are recommended for the body. The body is held in place with three wire clips.



MARDAVE Mk 2 ELECTRIC - INSTRUCTIONS

Radio Control equipment required

If you do not already have radio equipment, this should be of the 2 channel proportional type and a twin stick transmitter is recommended in preference to a steering wheel one. The car is designed to accommodate a receiver dry battery pack or a re-chargeable DEAC battery but a tap wire is also provided off 5 cells of the car battery pack for powering the receiver if required. This enables the weight of the car to be reduced and, if you have dry battery powered radio, effectively converts your receiver to rechargeable power with a consequent reduction in operating costs. The 5 cell tap will provide the same voltage as 4 dry cells of 1.5 volts each.

Tools and extras required

A few basic tools will be required including drills, pliers, screwdriver, 3mm spanner, small hacksaw, files and a small soldering iron and cored solder. Only 4 simple soldered connections are necessary and a soldering iron will undoubtedly be useful for repairing any crash damage. Some impact adhesive and paint for the body should be the only extra materials required.

Understanding your Mardave Electric R/C car

Although radio controlled model cars powered with miniature internal combustion engines have been available for some years (Mardave produced the first British made kit in 1970), electrically powered cars are relatively new. The problem in the past was always with the batteries which had to be either disposable dry cells (very expensive) or rechargeable nickel cadmium cells or wet cells which had to be charged at very slow rates (12-14 hours). The advent of fast charge nickel cadmium cells has completely transformed the situation so that we can now operate or race a high performance electric car for up to 10 minutes and then recharge the batteries from a 12 volt car battery in only 20 minutes, enabling for instance up to 6 races to be entered in an evening. In practice, races are usually of around 5 minutes duration which means that the batteries are only half discharged and it is therefore necessary to charge for 10 minutes only.

The motor supplied with the car is extremely powerful and will draw a very high current if stalled on full speed (up to 20 amps). This factor caused many problems in the design of early speed controllers and the one supplied is the result of extensive development. It has proven to be the equal of most other speed controllers including the expensive electronic pulsing types, many of which do not have reverse which is essential for racing. Mardave's speed controller is based on a printed circuit switch board fitted with 4 resistors giving 5 speeds in both forward and reverse. In addition, automatic dynamic braking is provided by short circuiting the motor, through one of the resistors, on the over-run.

Motor Position

The chassis is drilled to enable the motor to be positioned in front or the rear axle or behind it. We recommend the forward position for outdoor racing and for most indoor surfaces. If the track surface is extremely smooth and slippery however, the rear motor position can give more traction to the rear wheels.

Assembly The following are suggested methods and sequence of assembly.

Stage 1 - Chassis, motor, side tray, wheel and tyre assembly

Fit drive gear to motor shaft and tighten grub screws equally and securely. (Assemble motor to nylon bearing block with the M3 x 12 screws and one serrated washer under the head of the screw in the slot (See illust. 4). Do not over-tighten these screws or the motor casing may distort. Having decided on the motor position, fit the motor and the bearing blocks to the chassis with self tap screws. Again, do not over-tighten any screws into plastic components.

Fit side trays to chassis using M3 x 6 screws and nuts (Illust. 6).

Press front stub axles into the nylon steering arms and secure with 3m nuts on the insides.

Bond tyres to wheels. The best method is to apply impact adhesive to wheels and inside of tyres and allow to dry. Then apply more adhesive to wheels only and fit tyres while still wet.

Fit front wheels and adjust nyloc nuts to achieve minimum end float. Assemble rear wheels and axle to car and adjust motor position as necessary to provide a small amount of backlash between the gear teeth. There should be a small amount of end float between rear wheels and bearings to ensure free running.

Stage 2 - Battery, radio and speed controller assembly

Cut double sided adhesive tape to approx. 120mm length and then cut down the middle to make the battery attachment strips. Stick to side trays approx. 6mm from outside edge. Fit battery pack as illust. 1 for 4 cell or illust. 2 for 6 cell. Ensure that the tap wire is accessible. It is not important which sides the black and red leads are.

The following instructions are for conventional 2 servo radio equipment with twin joystick transmitter. The left hand or throttle stick should be spring loaded to the centre position. It is usual to install the servos and linkage so that the car turns to the right when the right hand or steering joystick is moved to the right and goes forward when the throttle stick is moved forward. Some servos rotate in opposite directions to others but this is not important, as motor direction can be reversed by changing over the motor leads and the steering can be reversed by connecting to either the top or bottom of the steering servo output disc or arm.

Fit the steering servo approximately in the position shown using double sided tape. If the linkage is to go to the bottom of the output disc, the plastic packer plate should be used to lift the servo slightly.

Assemble the pre-formed wire track rods from steering bellcrank (servo saver) to nylon steering arms and secure with plastic swing keepers. The short ends go innermost.

Before making the steering linkage, the servo must be connected to the receiver and battery, receiver and transmitter switched on and the trim on the steering joystick centralised. Then, as always, switch off the receiver before transmitter. The linkage should then be made so that the wheels point as nearly as possible to straight ahead. (There should be some toe in on the front wheels)

If a receiver DEAC or dry battery pack is to be used, this is best fitted just in front of the rear axle when the motor is at the rear or behind the rear axle when the motor is forward. Both this and the receiver are attached to the chassis with 'Velcro' tape. The Velcro strip supplied should be cut in half and one part bonded to the chassis with impact adhesive and the other part bonded to the receiver and battery pack.

The speed controller should be assembled to it's servo as per the speed controller instruction sheet.

The speed controller servo unit is fixed to the chassis with a piece of double sided tape. First assemble the resistor cover plate to the rear axle bearing blocks with self tapping screws and position the speed controller as illust. 5 with the resistors under the cover.

The switch is attached with double sided tape to the top of the steering servo (or any other convenient place) where it is accessible through a cut out in the body between the drivers arms in the case of the Saudia Williams or through the passenger seat cut out in the case of the Lola sports body.

Solder the motor leads to the speed controller wiper contacts and the battery leads to either side of the speed controller board. If the car battery is to be used for receiver power, the radio battery leads must be cut and one soldered to the tap wire and the other to the appropriate side of the speed controller board.

Several alternative methods of locating the receiver aerial are commonly used. The simplest is to tape the aerial to the inside of the body shell (Illust 1). This is effective but has the disadvantage of not being able to completely remove the body from the car. Another method is to attach the aerial to a plastic strip attached to the chassis (Illust 2 and 5). A strip is provided and will require one hole drilling 3mm diam. and several holes 1.5mm diam. to loop the aerial through. A third method is a vertical or whip aerial fitted to the chassis, usually about 30cm high. This is effective but tends to spoil the appearance of the car.

Stage 3 - Body, front bumper and rear aerofoil.

Saudia Williams F.1. Cut and file away body to clear front axle beam and track rods. Trim at rear as necessary to clear speed controller.

Cut and file front bumper plate to shape and attach with 6mm long screws and nuts.

Bond Velcro to side trays with impact adhesive (Illust. 1) and to inside of body.

Trim rear aerofoil and end fins to shape. Bond fins to aerofoil with impact adhesive. Drill 2 holes 3mm diam. where indicated on aerofoil. Assemble to chassis with black nylon pillars and 4 self tap screws.

The most suitable paint for the body is cellulose and car 'touch up' aerosols are ideal. The car shown on the box label is finished in authentic colours using paints and 'Letraset' but any colour scheme of your choice can of course be utilised.

Lola T294 Sports Assemble front bumper to chassis with 6mm long screws and nuts. Fit nylon front body stud pillar to bumper with self tap screw. Fit steel rear body stud to resistor cover plate with 2 nuts.

Cut and file wheel arches and rear of body. Drill, cut and file apertures for passenger cockpit and speed controller. Drill 2 holes 4.6mm diam. approx. where indicated on body, to fit over body studs. Adjust rear body stud for height as necessary. Body is secured by 2 wire clips.

Mark front bumper profile approx. 6mm larger than body. Remove from car and cut and file to shape.

Paint with cellulose spray and decorate with waterslide transfers and 'Letraset' as required.

Charging Instructions The charging leads provided are intended for charging from a 12 volt battery. Because of the voltage difference, a resistor is fitted into one lead. The other lead contains a fuse. The easiest place to attach the leads to the car is to clip them to either side of the speed control board, near to the battery connections. The RED lead must always be connected to the POSITIVE + terminal of the 12 volt battery and to the side of the speed control board to which the RED battery lead is soldered. An indication that the current is flowing can be gained from the resistor which will soon become warm. It will in fact get quite hot and should therefore not be placed on anything which will be affected by the heat. A useful improvement is to bolt the resistor to a piece of aluminium which will then act as a heat sink. Another useful accessory is an ammeter which can be fitted into either charging lead. The average reading should be around 3 amps varying from 4 amps when fully discharged to 2 amps fully charged.

Charge for NO MORE THAN 20 MINUTES, or the batteries may be damaged.

Final adjustments and operating

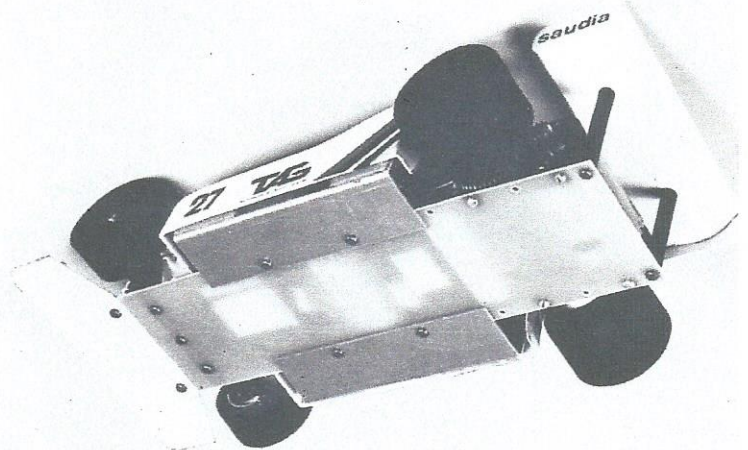
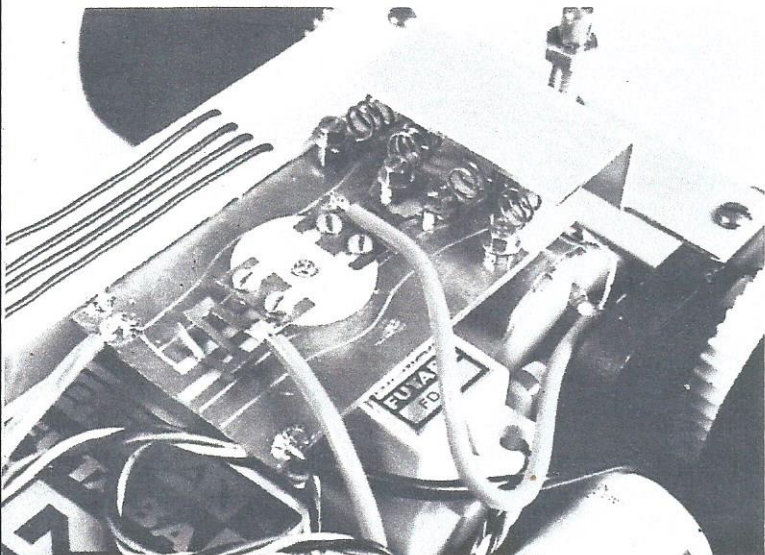
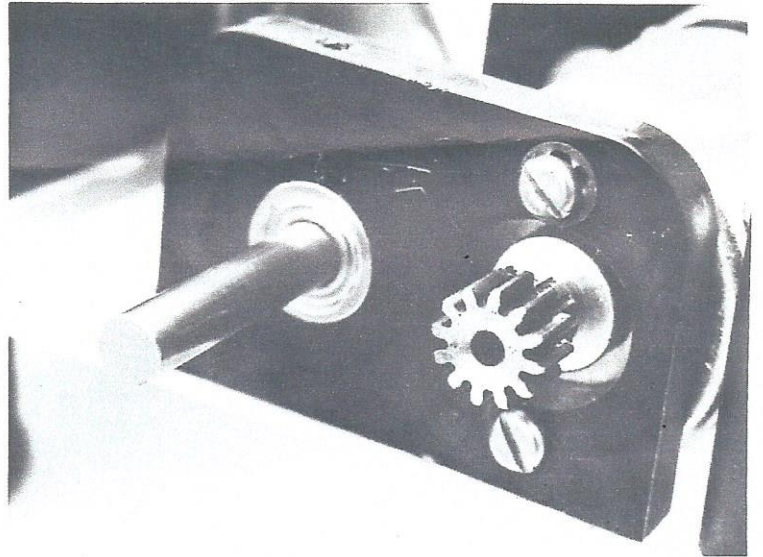
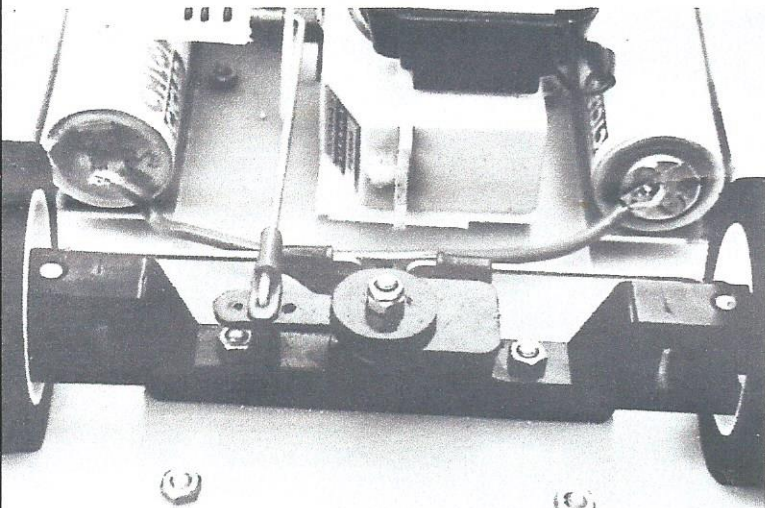
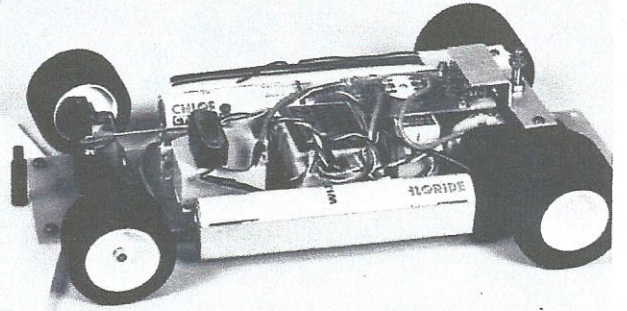
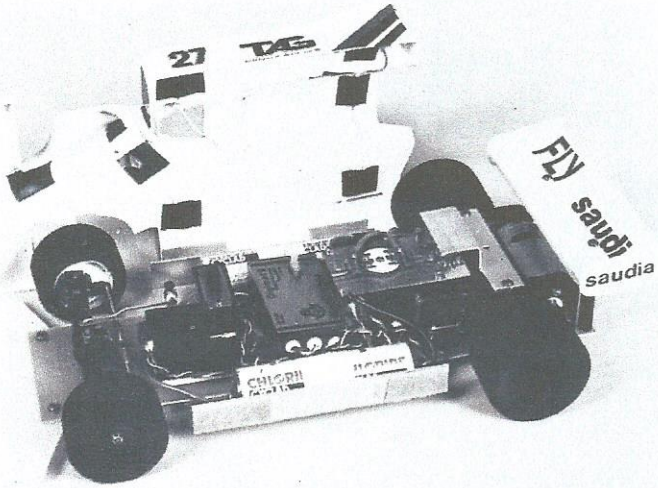
All linkages and moving parts should be checked for free operation. A drop of oil can be applied to front wheels, king pins and rear axle bearings. Check that the steering over-ride works freely so that, if the front wheels hit an obstacle, the servo gears will not be damaged.

Ensure that the speed controller works smoothly through all speeds. When operating the car, try to avoid stalling the motor. If the car does not respond to the throttle, switch off immediately and locate the trouble. If the spaces between the speeds do not seem to be equal, check and if necessary centralise the wiper contacts down the centre line of the brake circuit track on the speed control board.

We wish you much enjoyment from your car and would encourage you to locate and join your local club (or even start your own) as organised racing is the only way to really appreciate this exciting hobby.

Mardave R/C Racing, 7. Meador St, Leicester.

MARDAVE Mk.II ELECTRIC Illustration Sheet



MARDAVE MINESTOCK CAR KIT SPARES PRICE LIST FEB. 1985

Chassis plate, fibreglass	£2.00
Front axle beam with steering arms and king pins	.95
King pin	.06
Front stub axle with nyloc nut	.32
Steering bellcrank/servo saver, complete	.95
Track rod	.16
Rear axle bearing blocks without bearings, pack of 2	.95
Nylon bearings, pair	.32
Front wheel	.32
Rear wheel, with grub screws	.70
Tyre, front and rear	.36
Motor (Mabuchi RS. 54)	£3.95
Motor " complete with suppressor and leads	£4.70
Rear axle, high tensile steel	.48
Pinion drive gear, 12 tooth steel with grub screws	£1.10
Alternative pinions in nylon, press fit to motor, 10, 11, 12, 13, 14t	.64
Battery pack, 4 cells	£9.75
Speed controller complete	£3.60
" " printed circuit board only	.95
" " resistor wire	.32
" " wiper contact	.16
Charging lead for 4 cell battery	£3.60
Front or rear bumper mounting bracket	.64
Front or rear bumper plate	.36
Bodyshell	£2.00
Windscreen mesh	.64
Swing keepers, pack of 4	.36
Keys, for grub screws, 1.5 or 2mm	.13
Screws, any size	.03
Nuts, " except nyloc	.03
Nuts, 3mm nyloc	.10
Double sided adhesive tape, per strip	.11
Body clip, pack of 4	.48
Body fixing studs and pillars	.18

Your local retailer should stock the most commonly needed spares. In case of difficulty however, or for small items, we will be pleased to supply direct. Please add 10% (20p min., £1.0 for bodyshells) for post and packing.

Mardave R/C Racing, 7 Heanor St., Leicester

Tel; 0533 24701

WARNING — DANGER OF FIRE

In the event of the radio control receiver and transmitter being inadvertently left switched on after the model has been used, it is possible, several hours later, when the batteries are exhausted, for the speed controller servo to turn on. The model will not be able to move properly and so the motor will be stalled. Most competitive 1/12 scale model cars have very powerful motors which will draw a considerable current when stalled which will cause the speed controller to overheat. This could damage the speed controller and even ultimately cause a fire.

To ensure that this cannot happen, it is necessary to disconnect the motor and speed controller from the battery after use. For this purpose we now supply a plug and socket which should be fitted into one of the battery-speed controller leads. To do this, cut the lead, strip approx. 6mm of insulation, tin the ends of the leads with solder and crimp the plug and the socket to the leads with a pair of pliers. The socket should be fixed to the battery end. Disconnect the plug from the socket whenever the model is not in use.

VARIATEUR DE VITESSE

MARDAVE Mk.II SPEED CONTROLLER For radio controlled model cars, boats, tanks, etc.

This speed controller is primarily designed for 1/12th scale racing cars. It provides smooth control over both forward and reverse speeds and includes dynamic braking. This is achieved by providing a short circuit through two of the resistors when in the off position so that, on the over-run, the current generated by the motor acts as a brake.

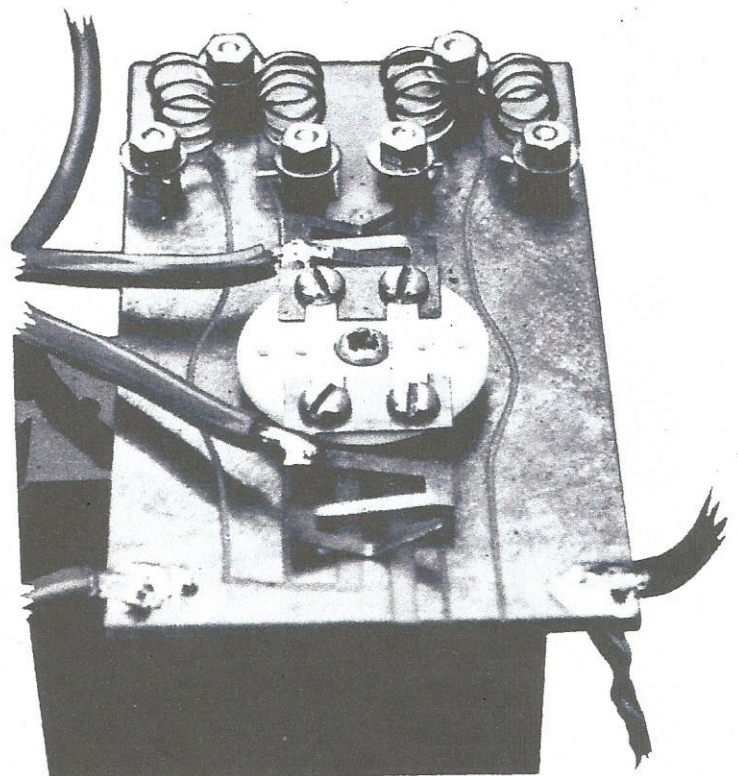
It is designed for mounting directly onto a rotary servo. A circular type output disc of about 18 to 22mm diameter is the most suitable for fitting the wiper contacts. The speed control board is attached to the servo with double-sided adhesive tape. To fit the board, first cut a piece of tape to approximately 40mm long and, with a pointed knife, cut a hole approximately 10mm diameter in the centre to clear the servo output shaft. Clean the top of the servo and the underside of the board if necessary before assembly.

The wiper contacts are fitted to the servo output disc with four self-tap screws. If necessary, drill holes in the output disc for the screws (1.7mm diameter, 6mm apart). Ensure that the ends of the screws are clear of the board surface or a short circuit may occur when operated.

Using pliers, shape the wiper contacts as shown to make light but positive contact with the board.

Solder motor leads to the contacts and battery leads to either side of the board as shown. Motor direction can easily be reversed by changing over the motor leads.

WARNING — The resistors will become hot if the motor is stalled repeatedly. It is recommended that bodyshells, wires or any inflammable items are positioned at least 15mm clear of the resistors or, better still, that a metal cover is fitted over the resistors, as in Mardave's Mk.2 racing car.



Ce variateur de vitesse est spécialement désigné pour la voiture électrique au 1/12^e. Il permet une variation très progressive de la vitesse aussi bien en marche AV qu'en marche AR et comprend également un système de freinage du moteur en reliant les 2 bornes du moteur entre elles, en passant outre les 2 résistances, ce qui transforme le moteur en générateur qui agit comme un frein.

Son dessin permet le montage sur n'importe quel servo rotatif avec un bras de servo circulaire de 18 à 22 mm afin de fixer les frotteurs. Le variateur de vitesse est fixé au servo avec de l'adhésif double face. Découper une bande de 40 mm de long de cet adhésif en prévoyant un trou central d'un diamètre de 10 mm qui permet le passage de l'axe du servo. Ne pas oublier de dégraisser le dessus du servo et le dessous du circuit imprimé avant le collage. Les contacts sont fixés au servo par l'intermédiaire de vis Parker. Si nécessaire percer les trous du disque du servo au diamètre 1,7 mm avec un espacement de 6 mm. S'assurer que les extrémités des vis ne viennent pas toucher le circuit imprimé, ce qui pourrait provoquer des problèmes. Plier les contacts tel que la photo ci-dessous. Souder les fils du moteur sur les frotteurs et ceux de la batterie à chaque extrémité du circuit imprimé. La polarité du moteur peut être facilement inversée en changeant la position des 2 fils.

ATTENTION: Les résistances peuvent devenir chaude si le moteur est alimenté et ne tourne pas pour une raison ou une autre (par exemple voiture bloquée contre un obstacle). Il est recommandé que les carrosseries ou ailerons ou tout autres parties inflammables soient positionnés à 15 mm des résistances ou mieux, il est conseillé de mettre un carton métallique au dessus comme celui prévu dans le kit Mardave électrique.