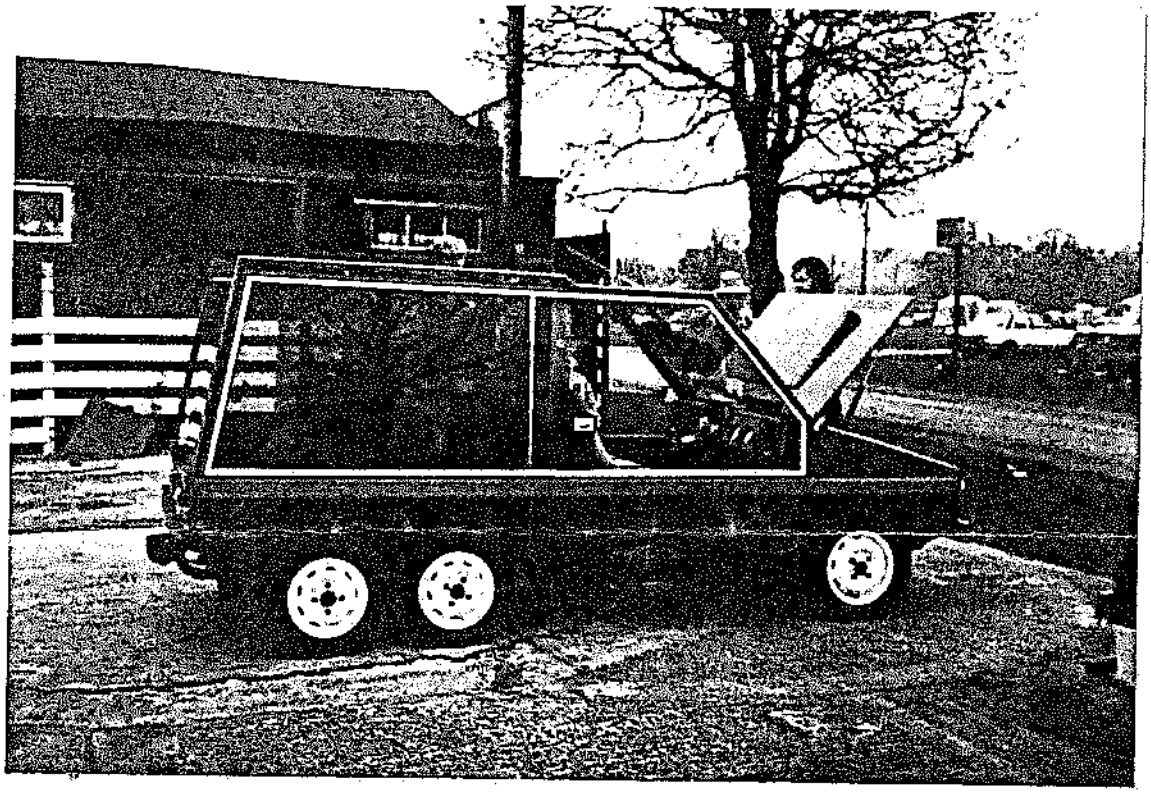
HUSTLER

Journal of the kit car élite

no. 11



Welcome to issue no. 11. It was nice to see many of you at Kenilworth. For once the weather was good, I hope it was a good omen for the rest of the year.

I am still living out of a suitcase while I am compiling this issue of the newsletter. Hopefully by the time you all receive it I will be settled. It has been quite a hectic 3 months since newsletter no. 10. as you will see from the short story on the following pages.

John Hother sent me the article on the Microdot. Although it is an old article, I thought you might all be interested in reading it.

Keith Sharp, who as you will have noticed is a regular contributor to the newsletter has come up trumps again with an excellent article on wheel sizes and tyres. Many thanks again Keith. And for those of you who visited Stonleigh will have seen the Super car he has built. It is Keith's car on the front of this newsletter by the way.

As you will all see from the drivel that I have contibuted on pages 6 & 7, I am once again struggling to find Hustler orientated information.

Please put pen to paper. In the past , the articles have all been well received. Please help me to keep up the momentum we have achieved.

Don't forget the Hustler at Home on the 5th & 6th July. It promises to be the best one yet. If you intend going would you please let Mr & Mrs. Towns know. A card or quick phone call will suffice. I can only manage to get there for the Saturday this year, but I will get the Bar B Q organised for Saturday night. It will be in the Barn the same as last year, just in case it should rain. All you have to do is appear with your food and booze.

And lastly, I apologise to anyone who has tried to phone me and got no reply in the last couple of months.

New Hustler Owners Club address (at long last)

As from 14th July.

Lee's Takeaway
30 George Street
WARMINSTER
WILTS.
Telephone 0985 218826.

Newsletter no 12 due for publication 1st Oct. Articles for inclusion by the third week in Sept please.

Geoff.

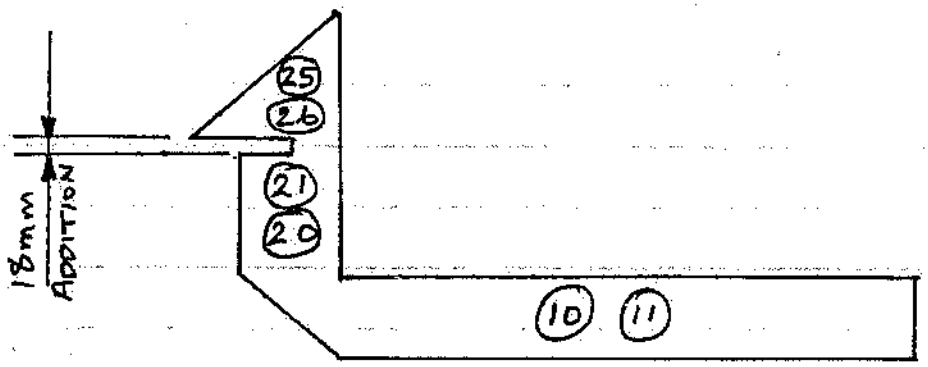
24, Montrose Park,
Brislington,
Bristol. BS4 4JF.
16th June 1986.

Dear Trevor,

At last you will find enclosed a small offering that I hope might be of interest to those just starting a Wooden Hustler.

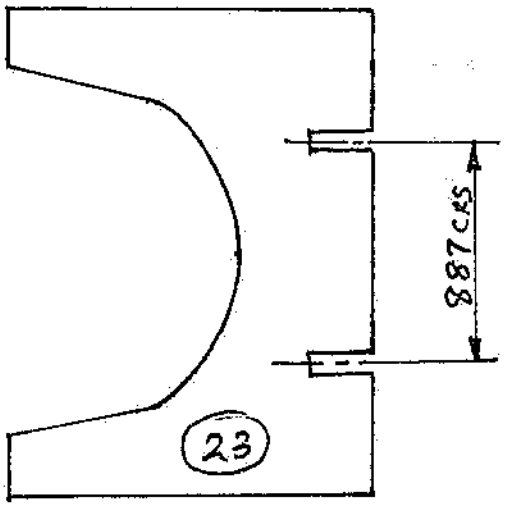
Having picked up my set of Plans from William, one of the first things I did was to make a scale model out of 1½ mm Plywood. From this it became obvious that a few alterations could be made that I believe improve the strength of the Vehicle. It was possible for me to make these modifications easily because I am building a 6 wheeler and there is Wood to spare. It would probably mean purchasing an extra sheet of 12mm Ply if you intend to build a 4 wheeler.

1) By making (25) (20) and (10) in one piece instead of 3 seperate pieces you save 2 joins and improve strength. This is of course repeated with (26) (21) and (11) on the other side If you look at your plan you will no doubt point out that (25) and (26) are 18mm and that the rest are 12mm. If this worries you, you could add a section of 6mm Ply to the sides of them. I have built in the cubby boxes and therefore (41) and (42) assist in strengthening.
NOTE. These had to be cut down in width by 7½ mm.



P.T.O.

A halving type joint has to be cut between (20) and (21) and also between (20) and (25). To match up with these, mating joints are cut in (23). They need to be 12mm wide with 887 mm centres.



2) When you get around to attaching the roll bar to (19) this is a little precarious but it can be strengthened dramatically by attaching a section of roll bar material to the sides of (10) and (11) and the back of (19) This is then attached to (2) when the rear section is joined to the front.

3) If you are going to use the Mini Van tank fitted in it standard position underneath the front passengers seat it is advisable to sort it's fitting out before attaching the front to the rear half of the car especially if you intend taking the filler pipe through the roll bar.

4) It is not obvious until you check carefully that the main 4 top bolts into the front subframe tilt backwards: BEWARE.

5) If you are building a 6 wheeler with the rearmost subframe reversed, do not forget to shim the outer mounting points of the radius arm by about 3mm to reverse the toe-out to toe-in.

Yours faithfully

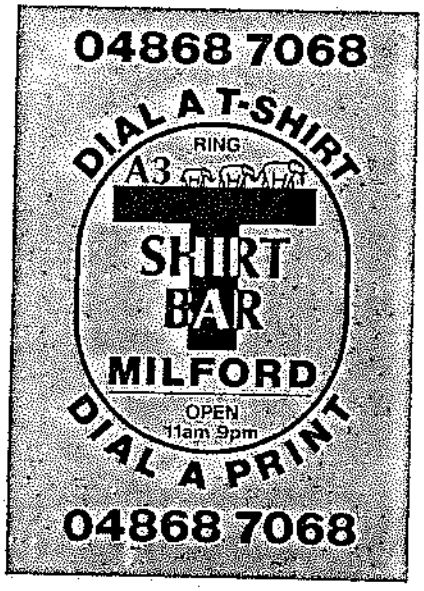
T. M. S Brazier

I **SIZES** *Chest or bust size in inches, 2" size steps*

1. Inches	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50
2. Ladies' Bust						10	12	14	16	18	20	22	24	26	28
3. Men's Collar						13½	14	14½	15	15½	16	16½	17	17½	18
4. Children's Ages	2	4	6	8	10	—	—	—	—	—	—	—	—	—	—

A. LOOK AT THE PRICE GUIDE

Item	Price Guide	
	From	Average
T Shirts	1.95	4.95
Sweatshirts	4.95	8.95
Sports Shirts	6.95	12.95
Men's Shirts	6.95	10.95
Ladies' Blouses	6.95	10.95
Overalls	19.95	24.95
Jogsuits	19.95	24.95
Tracksuits	24.95	29.95



The address for those who wish to visit the shop is:

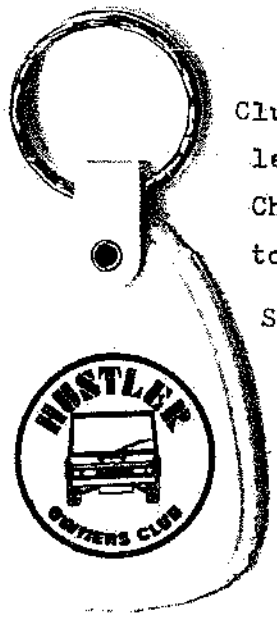
3 New Road, MILFORD. Surrey.

On the A3 next to the 'White Lion Pub!

Club Badges as on the right.

Cloth, Black & White.

£1.20 each.



Club Keyrings as on the left. 30. pence each.

Cheques made payable to 'Hustler Owners Club'.

Send to :

Trevor Faithfull
30 George Street.
WARMINSTER
Wilts.

Theres no fool like an old fool or Serves you right.

After more than one score years in the service of the Monarch, guarding the colonies against usurpers, the head of the House of Faithfull grew weary. He yearned for the quiet life of the " Nine to Five". And so in his middle years did join the House of Civil Servants. By the third year of this self imposed penance the head of the House of Faithfull, whose mental health was now in danger, was gibbering and frothing at the mouth in frustration." Release me from this torment." He cried. " There must be more to life than this."

And it came to pass, in the days following the Day of All Fools, in the third year of the being of the Hustler Owners Club. That the House of Faithfull, their lands disposed of, with his children and his childrens children, his oxen and Hustler laden with their possessions and chattels, did journey north to take over custodianship of a House of the Kings of the Road. The Kings of the Road whose mighty steeds do thunder the length and breadth of this wet and dismal land, would rest and partake of nourishment such as egg beano's and chip butties and sleep in rooms one atop the other as do battery hens, and would pay handsomely for the privelege.

But a dark shadow was cast upon the land. The resident custodian of the House of the Kings of the Road, was summoned to appear before the Great Taker of Taxes, and asked. " From whence cometh all of your untold and undeclared riches." And he was ashamed, and his advisers said unto him. " Before you can move on to pastures new, you must first put your house in order and dwell therein until the collector of Great Taxes is appeased.

And so it was that the house of Faithfull with his children and his childrens children, with their oxen and Hustler laden with their chattels, were cast into the wilderness, to wander aimlessly to and fro across this wet and dismal land. In search of a resting place and sustenance.

For more than fourty days and fourty nights did the house of Faithfull suffer in torment, except for one brief sojourn to the great gathering of Eccentrics at Kenilworth, to reaffirm his beliefs and allegiances, And to admire other Eccentrics and to pour scorn on others as was their custom.

And ere long the head of the House of Faithfull began to feel the financial pinch, and so did venture into the house of the giver of all benefits, the House of the Social Security. " Begone knave. " cried the weasily faced cretin behind the high desk. " This house only bestows bountious gifts upon the deserving and needy, such as the Pilgrims and Hippies of the Peace Convoy, and other deserving wasters and layabouts.

" Because you are the architect of your own downfall, you will receive nothing."

Crestfallen ,head bowed and deeply ashamed for the trouble he had caused, the head of the House of Faithfull slunk towards the door, but not before striking one blow for freedom. He broke one of the Weasily faced cretin's plastic biro's on his way out.

And so once more the House of Faithfull, his children and his childrens children, with their oxen and Hustler laden with their chattels did again set out on the road of torment. Remembering the words of the Weasily faced cretin at the House of Social Security, the head of the House of Faithfull sought to find the secret of the Hippies in their enjoyment of social security and supplementary benefit, and did journey to the South of this wet and dismal land, to traverse the same route as the Peace Convoy, from the sacred relics of Stonehenge to the Mystical Tor of Glastonbury to try to learn their secret formula.

It was while on this ardous journey, that the caravan that was the House of Faithfull, did pause to nourish and quench the thirst of his oxen and Hustler, laden with chattels, his children and his childrens children, that he did notice the multitude of comings and goings along this road. The people of Peace, their pockets bulging with the benefits of the House of Social Security, Drivers of little tin boxes who passed on their way to gawp and stare in amazement at the Palaces of the rich at Longleat, and for their children to throw stones at the beasts of the field in the Safari Park.

But one thing was lacking, a House of Internal Refreshment.

And so the head of the House of Faithfull did negoiate with a Shylock for the tenure of a suitable abode in which to provide this refreshment. The Deed was drawn up and the Shylock spoke to the Head of the House of Faithfull. " Thou shalt pay this exorbitant rent promptly for this valuable hovel, and on the third anniversary of this date, I will again increase the rent and so on every third year during this tenancy until you wither and break under the strain."

And thus the deed was done. The House Of Faithfull, his oxen and Hustler, his children and his childrens children had once again sold themselves into bondage, to toil twenty five hours in the day, and nine days every week for all eternity.

48,Meadow Way,
Walton,
STONE,
Staffs.
ST15 0JP.
Tel: Stone (0785) 817866.

Dear Trevor,

Rubbing Tyres

Tyre sizes have always puzzled me and because of my problem of the rear wheels rubbing when the suspension is fully loaded I decided it was time to try and rectify the problem. So I decided to find more info. on 'normal' and 'low profile' tyres.
Taking radial ply tyres as an example, and in particular the tyres fitted to the rear wheels on my Hustler which are 155 x 12, the 155 (in mm) refers to the width of the tyre and the 12 (in inches !!!) refers to the dia. of the hub.

The depth of a normal tyre is usually 80% of the width.

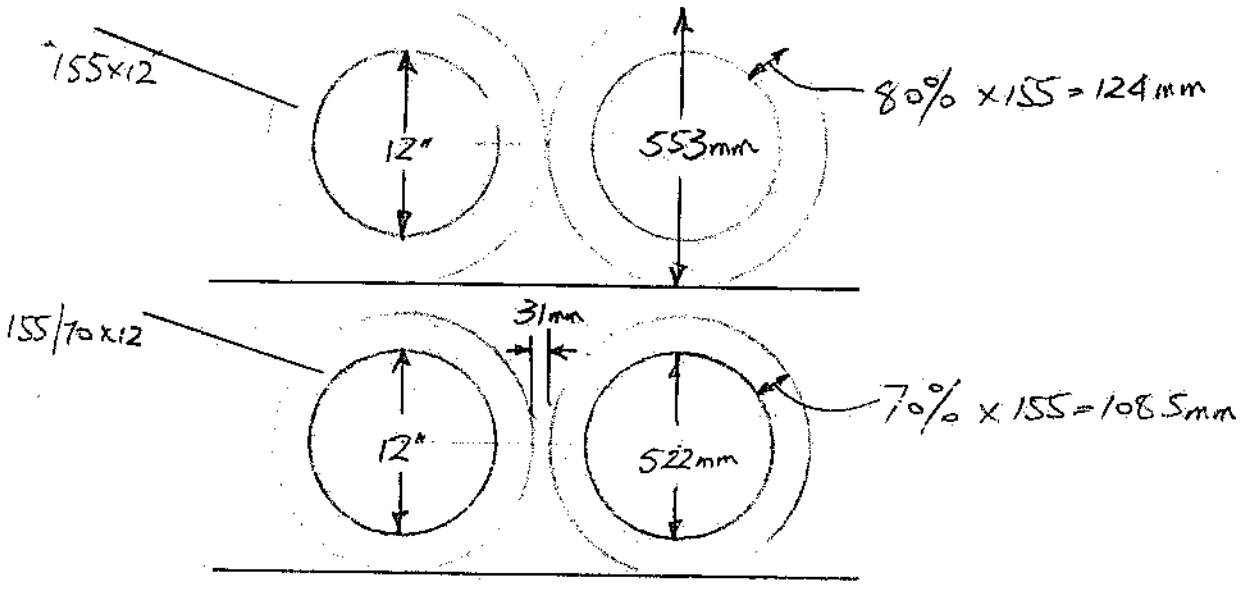
Therefore the overall wheel dia is as follows :-

$$(155 \times \frac{80}{100} \times 2) + 305 = \underline{553 \text{ mm}} \quad (12" = 305 \text{ mm})$$

Now a 155/70 x 12 means that the tyre depth is now 70% of the width.
Therefore the overall dia of the wheel now is :-

$$(155 \times \frac{70}{100} \times 2) + 305 = \underline{522 \text{ mm}}$$

So now there is a difference of 31mm which taking into account the fact there are two wheels gives now an extra gap of 31mm therefore solving my problem of the tyres rubbing. (when fully loaded there isn't in actual fact a gap of 31mm because the old tyres were ½ worn. If they had been new tyres then the gap would have been even less. Although the new tyres have a deeper tread the lower profile more than compensates. For instace when the car is not loaded at all the gap with the part worn tyres on was about 20mm, but with the new low profile tyres on the gap is about 40mm. Now enough of a gap to stop them rubbing when fully loaded). (see dia below)



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Alternatively I could have fitted 145 x 12 but as the calculation shows the clearence is only about half as much.

$$(145 \times \frac{80}{100} \times 2) + 305 = 537\text{mm}$$ (subtracting from 553 = 16mm)

Now an interesting observation was brought to my attention when I enquired at Michelin, here in Stoke, about the wheel rubbing problem. The chap in the Technical Dept. that I spoke to gave me an example of what tyre size you need if you want to put 'fatter' ones on existing rims. Taking 155 x 13 this time as our example. So as not to alter the gearing (and the speedo accuracy) a tyre has to be fitted so that the overall dia. of the wheel is the same.

Therfore the dia of a 155 x 13 is $155 \times \frac{80}{100} \times 2 + 330 = 578\text{mm}$

So to fit a 'fatter' tyre and keep the dia of 578mm, a 175/70 x 13 will do the job.

$(175 \times \frac{70}{100} \times 2) + 330 = 575$ (pretty close eh! what's 3mm between friends).

To go even wider, say 185/70, to retain the same wheel dia the rim size has now to be increased to 14 eg.

$$(185 \times \frac{70}{100} \times 2) + 355.5 = 577.5$$ (not bad eh! only ½mm differance)

155 x 13 = 578mm
175/70 x 13 = 575mm
185/70 x 14 = 577.5mm

So by increasing the hub size by 1" the overall dia stays the same. I bet there are many more interesting hub size/tyre size relationships than the examples I've shown.

So if you want 'fatter' tyres and don't want to alter the gearing etc it's not a simple case of 'slapping on' any old tyre.

Of course 'cause the wheels will be staying on the rear of my Hustler I'm not to worried about gearing, but for the same reason, that's why I've put 155 x 13 on the front because that is what's fitted to Maxi's.

Another interesting observation - if you change a 145 x 13 for a 155 x 13 the car now stands some 8mm higher of the ground!!

(155 x 13 = 578mm, 145 x 13 = 562 which is 16mm overall in dia, a difference of 8mm in depth)

Rattling Windows

I now think I've at last cured my rattling glass. When the sun roof was open the glass vibrated in the lower channel, so all I did was to squeeze the channel in selected places to make it smaller. Apparently the channel is to wide for the latest glass because the glass is now some 1 to 2mm thiner than originally designed.

Keith Sharp STONE Staffs.

TOWNS HYBRID CAR FOR

William Towns has built a tiny car to run on batteries

WHILE the Japanese are testing Toyota's 100 mile/h gas turbine/electric hybrid car, backers have failed to materialise for Britain's best attempt yet at a hybrid vehicle.

Nobody pretends that the British Microdot town car is in the same speed category. It is not intended to be. Its design is much simpler. There is no gas turbine. There are no illusions about high-speed cruising.

And yet it may be Britain's only serious competitor in a field in which every Japanese motor manufacturer is working. One estimate is that within five years hybrid cars will start appearing on the noisy, polluted streets of Tokyo. Even if there is no market yet in Britain —and nobody is prepared to say that— Microdot has immense export potential.

Fine pedigree. So far the car's only claim to fame is that it has created nothing more than a dismal lack of interest since it was first shown at the Motor Show in October. Yet it has one of the finest design pedigrees in Britain's motor industry. For it came from the same drawing board and the same converted farmhouse studio garage as Aston Martin's new 160 mile/h Lagonda four-door sports saloon. Both were designed by William Towns of Stretton-on-Fosse, Gloucestershire.

The Lagonda, perhaps rightly, stole the sparse limelight at Earls Court. Yet not far away from the Aston stand was the 2 m long Microdot. A Press conference was planned for a week before the show.

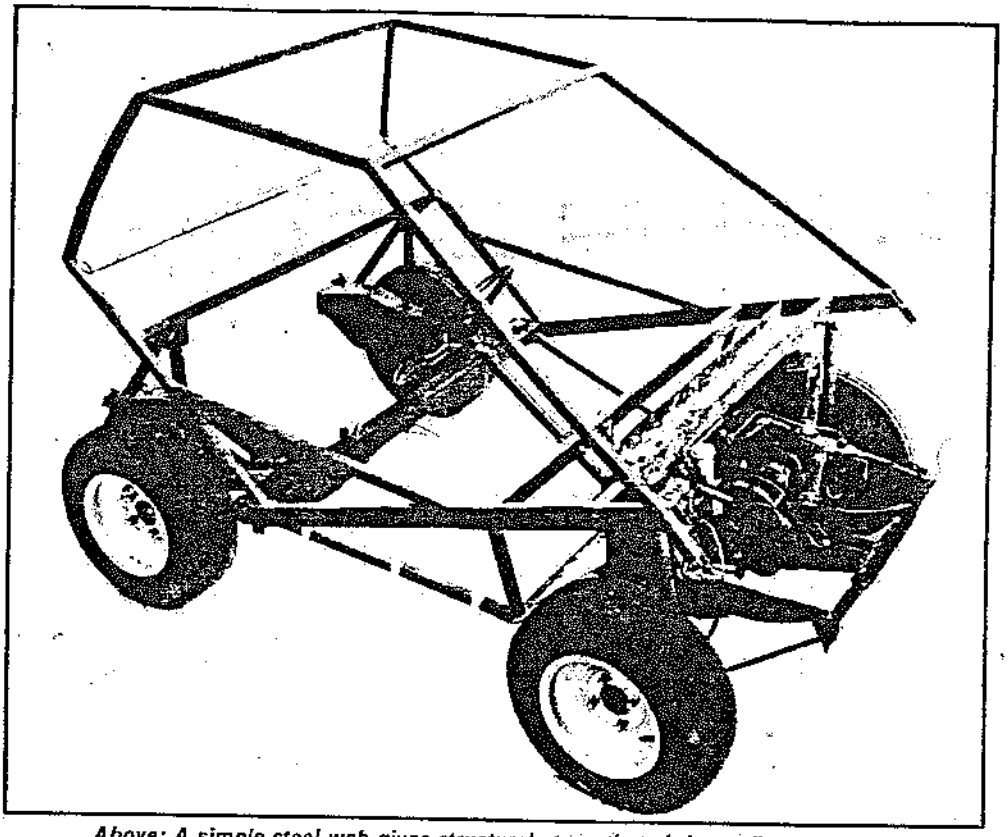
However British Petroleum—whose BPCI chemicals and plastics offshoot supplied more than half a tonne of free Cellobond polyester resin for the glass-fibre reinforced plastic bodywork—cancelled at the last moment.

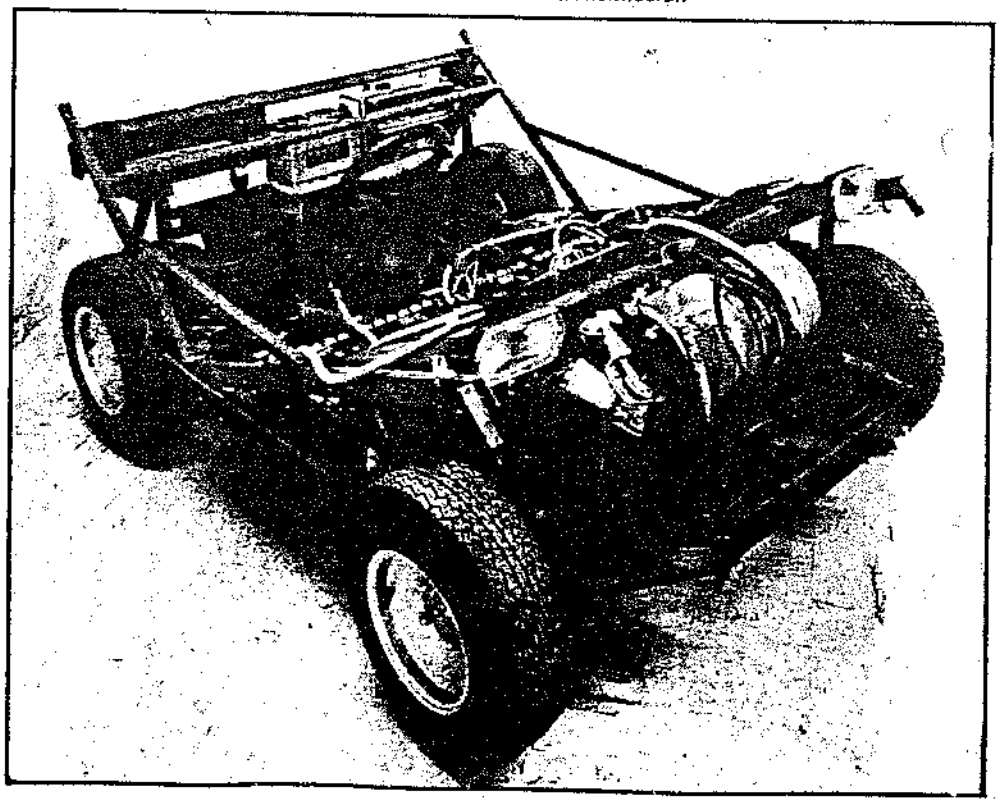
BP realised at the eleventh hour that it would not do to be seen shouting too loudly about an electric car, even if it was a hybrid with its own miniature petrol-engined generator.

Now Towns may be resigned to completing the car, testing it, and using it for personal town driving — unless a backer appears to translate the prototype into a production vehicle.

So far Towns has borne all the cost of developing the vehicle. He would not put a figure on its cost, but production of brackets alone cost him £400. He has had considerable help from industry. Batteries, electric motor, and petrol generator as well as tyres and lights were supplied by leading firms.

Price. A production vehicle — even from a weekly run of 300 units — would be cheap to assemble, says Towns. He suggests a price of £1 200 to £1 500, but admits that for this the vehicle would have to revert to a petrol engine. The full hybrid version as it

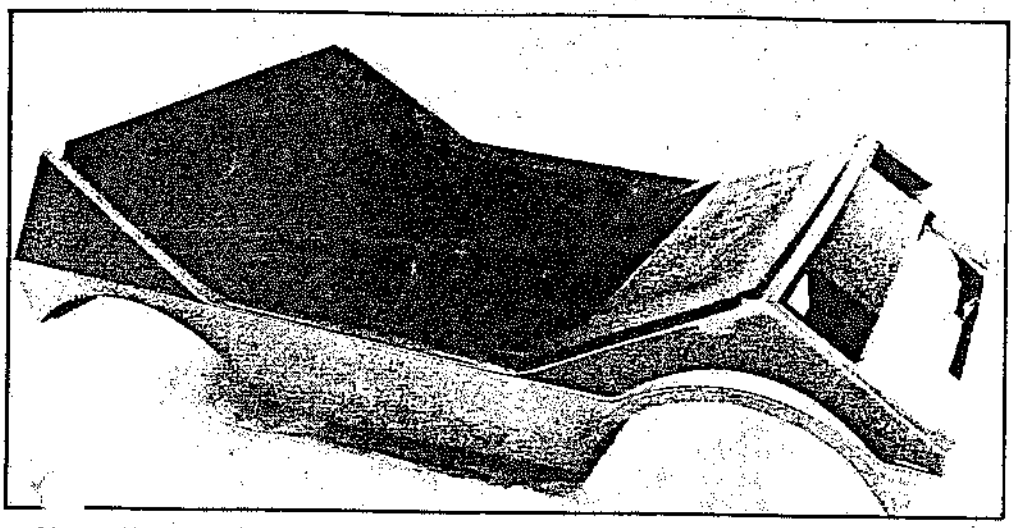




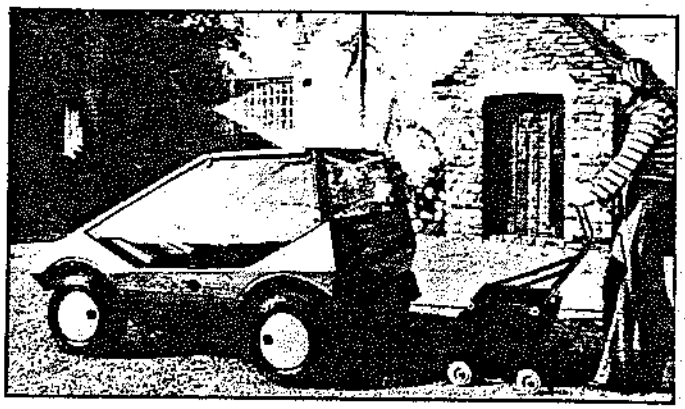
Above: A simple steel web gives structural strength and the outline shape for Microdot. Below: The rear-mounted Honda petrol generator sits snugly alongside one of the five Exide batteries, and a chain drive links the electric traction motor to front-wheel transmission

THE MAN ABOUT TOWN

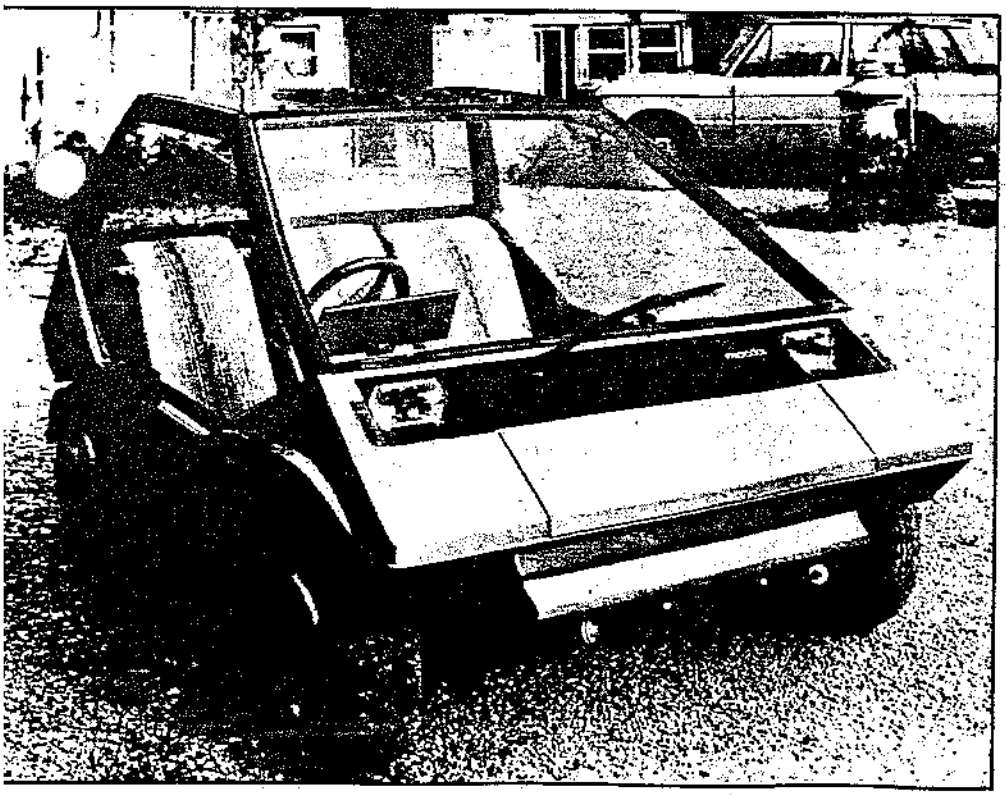
echarged by petrol-driven generator. By Lynton McLain



Above: Simple design was the aim behind this polyester grp body moulding for William Towns' Microdot hybrid city car



Right and below: Three-abreast town shopping is possible with the petrol/electric self-contained Microdot



now exists would cost nearer £2 000.

As it stands the town car is one of the first genuine petrol-engined electric hybrid vehicles in Britain. Others include two designed and made by John de Gruchy, a retired designer living at Blandford Forum. de Gruchy worked closely with Towns on the electrics for the Microdot car.

Microdot weighs 10 cwt with driver. There is room for two passengers sitting alongside. Luggage and shopping can be kept in an integral fully portable trolley which sits under the seats.

Traction is provided by a single 5 968 W shunt-wound permanent magnet electric motor. This takes current from four Exide Supreme car batteries under the seats. Chain-drive transmission is through the front wheels. The big motor, scrap from Enfield, will be replaced by a small unit.

At the rear is a tiny Honda ED 250 petrol-driven generator. At the moment this is not sufficiently powerful to match the electric motor's power demands. A 3 000 W generator with a 350 to 400 cm³ engine is needed, but space limitations forced Towns to install the smaller Honda unit in this prototype.

No current drain. Parked overnight, the Microdot starts morning town journeys with full batteries. In a matched hybrid car there would be no overall current loss from these batteries, as the on-board generator would be engaged immediately. Only in dense traffic in restricted pollution areas would the petrol engine be switched off, leaving Microdot to glide quietly under all-electric power.

This is the approach the Japanese car firms envisage for their hybrid cars. Any current drain from the batteries would be made up overnight at reduced rates.

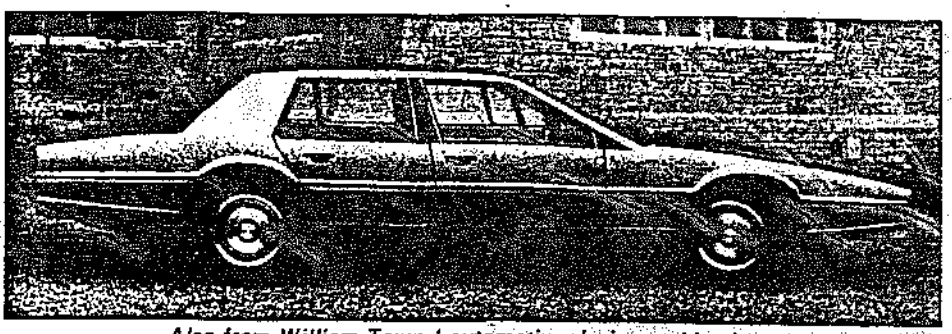
In Microdot the generator is wired to the traction batteries through a diode. This prevents current from the batteries discharging into the generator windings. To start, a dashboard touch switch is operated to short-circuit the diode. This starts the generator, now acting as an electric starter motor, which in turn starts the petrol engine to recharge the batteries.

Towns is convinced the miniature petrol engines — less than 400 cm³ — can be made to operate with optimum efficiency in the hybrid vehicle. Engines can be finely-tuned to run at a constant speed, with the minimum of pollution which attends engines expected to run over a wide speed range on fixed carburettor settings.

Microdot's petrol consumption — although not yet tested — is expected to be around 1·6 pint/h with the generator and electric motor working at 80% efficiency.

This gives Microdot a range [illegible]

OVER.



Also from William Towns' automotive design stable, Aston Martin's 160 mile/h Lagonda

of 150 miles on one gallon of petrol or five hours at 30 miles/h.

Towns has tentative plans to develop the Microdot's hybrid power system even further, giving it fully automatic regeneration from the main traction electric motor when used in hilly country. But he has said he will not proceed much further with the car, other than getting the prototype fully tested and running, unless he finds backers willing to fund development of a production version.

'If nobody wants it, at least I will have something that I would be pleased to own myself,' he told me last week.

He was keen for somebody to come along and talk to him about taking the idea further, for he believed it was 'about time we learned to become poverty stricken' — a paradoxical statement for someone who has been instrumental in helping Aston Martin sell more than 100 new Lagondas at the Motor Show for nearly £25 000 apiece.

Objectives. But simplicity and low-cost production were the standpoints Towns started from in designing Microdot. He wanted a car that would be 'very cheap to make and run'. And he may have achieved these objects with Microdot. But ironically he did not set out to design a hybrid vehicle, 'although the thought was in my mind from the start,' he said.

'If I had found an internal combustion engine with a suitable-size gear box, I probably would not have gone for a hybrid. It was a vehicle concept I was after that was cheap, and short for town use.'

Now he is convinced a hybrid is the 'only way to use electricity in a passenger vehicle which makes random journeys'. With the right petrol engine generator/traction motor match, hybrid vehicles should have unlimited range and environmental advantages.

Towns searched Britain, Japan, and America for the right engine for Microdot. Britain had two main contenders — RCA marine engine makers of Bodmin, Cornwall, with its 600 cm^3 two-stroke twin, and Derby-based Silk Engineering which offered a 660 cm^3 45 bhp unit. Both were too big for Towns' car. Villiers' engine was 'too tall', and the US Tecumseh unit was considered but rejected.

Production choice. Now, with 'every Japanese car maker looking at hybrid town cars', Towns is convinced he will have to go there for the petrol engine for any production version of Microdot. A likely choice is the 360 cm^3 water-cooled, twin two-stroke Daihatsu. General Motors, US also has a hybrid.

But Towns is not sure his car will get to that stage. He freely admits there may not be the demand for the hybrid vehicle in Britain. He is more convinced that the single power source version should sell well.

'But legislation would change things overnight,' he added. 'This is what is happening in Japan, but I don't see people in Britain thinking sensibly about this.' In Germany Aachen's Technical University has converted a Volkswagen Microbus to hybrid Wankel/electric drive. Fuel savings of 40% are reported.

Towns sees a society where the tiny functional car is the accepted order of the day for town centre use. The Microdot itself is so tiny that it can be parked at right angles to the kerb.

Japanese appeal. But Microdot may never be seen gracing a British kerbstone. Within 5-10 years the Japanese car makers will have their own hybrid town cars, carrying two or three passengers in pollution-free quiet comfort. They may even recognise the potential of Microdot's cheap, functional simplicity before a British maker sees production possibilities.

Wedded to the futuristic British-designed car body and chassis the combination of miniature engine and miniature car could have much appeal to the miniature Japanese.

Already Towns is talking of 'doing a Sinclair' and approaching the National Enterprise Board for aid to take Microdot to the production stage. But, NEB or private British industry, somebody should step in and help Towns play the Japanese at their own hybrid town car game. Even if Britain does not want Microdot, the Japanese almost certainly do. IE