Umap

Umap can be translated as standing for *Modern Application Plastics Factory* with the words obviously moved around in the translation from *Usine Moderne d'Applications Plastique*! It was a company founded in 1956 by an engineer from Burgundy called Camille Martin, and located in the small village of Aube de Bernon, about 140k S-SW of Paris, where Martin was currently Mayor. Marin's primary object for the company was to realise an automobile based on the humble Citroën 2CV origins that bore all the hallmarks of an upmarket 2+2 Sports or GT car.

However, as is often the case, things were not as straight forward as that. The company UMAP in fact arose out of the sale by Jean Dagonet of the assets of his business in March 1957. This followed health problems that be had suffered which were significant enough for him to sell his interests in both the mechanical tuning business RAF to Sir Adam, with the remaining shares still held by Jean De Pontac, and the Dagonet body and car building arm to Martin.

Anyone who knows anything about Citroën 2CVs outside the norm will be aware that Dagonet had been a long time 2CV protagonist. He was an experienced mechanic with an interest and background in mechanical design and engineering, who shortly after the 2CV's launch became intrigued by its design and its development potential. In 1951 he set up a

business, RAF, with Jean De Pontac to pursue this interest commercially. During 1951 and 1952, Dagonet first designed then set up production of a chopped and channelled 2CV saloon that was both successful in competition and in the salesroom to rally drivers. It looked longer than a 2CV but that was an illusion created by its low height, as it was in fact built on the regular 2CV chassis. This Dagonet followed with a two door coupe that was released in 1956, clothed in a glass reinforced plastic body. It was an interesting design that showed influences of a variety of origins that drew a lot of negative comment, and as a consequence was not commercially successful.

However, moves were already afoot for another design to be developed that was based on a model that Dagonet had already prepared prior to the previous coupe. This car had the hallmarks of the best 2CV derivatives produced by Philippe Charbonneaux and others. Jean Dagonet had received considerable input from Jean Gessalin of Chappe et Gessalin aka CG, in its design, and all this showed in its final form.

The company Dagonet had been very much involved with polyester laminate design and production before its sale, having built quality GRP

Top: tiny UMAP badge on boot, prominent Citroen insignia on bonnet – UMAP hoped Citroen would take the bait... Above: Dutch restored car.

bodywork for both its saloon and the short lived coupe. So UMAP did not start from scratch. However, like the Dagonet company it had taken over, it wasted no time in achieving what it set out to do by quickly turning a model into a full size car. This achievement may have been as much to do with the fact that the *company* Dagonet came with the expertise and assistance of the *man* Dagonet who worked hard to help Martin achieve his plan. In March 1956 UMAP had inherited the basis of a new model and amazingly by October the same year two beautifully presented cars were displayed at the Paris Salon.

At the show the car drew a lot of interest and good comment for its mature and cohesive body design, its construction and fit and finish, and also for its consequently high price of 929,000 francs for the 500cc version, which was over double the price of a current 2CV. However, in France, anything over 435cc went into the 3CV tax class, hiking the price over that of a 2CV rated vehicle.

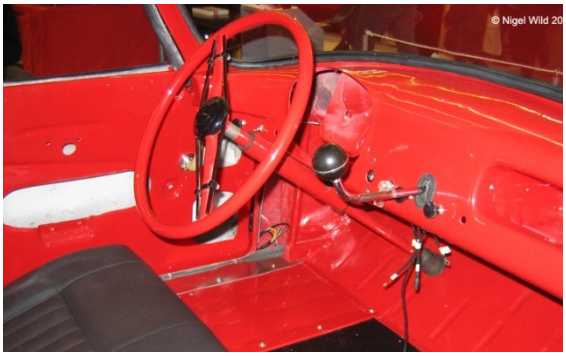
Off course Jean Dagonet was aware of this, and for his previous models had produced engines of the very limit of 2CV tax-break capacity. On offer with the new Umap car, were in effect engine versions offing three different capacities. On the bottom rung was a standard 424cc engine with RAF manifolds and exhaust that upped the power from 12 to 14bhp@4500prm using a single barrel 32mm IN Solex carburettor instead of the original 26mm unit – don't laugh, that's almost 17%! This kit, not designed by Jean Dagonet but produced by RAF, originally started out when the 2CV engine was only 375cc, and was used to up the power accordingly from 9bhp by boring out the cast iron barrels and fitting higher compression alloy pistons.

Next up was the full 435 conversion which entailed RAF's own aluminium barrels

with chrome bores. These were a result of research and development work done by Jean Dagonet with a company called Monopoly Poissy, and manufactured by the Mining and Metallurgical Company of Perigord. The engine bore was enlarged to 66.9mm to make this capacity, creating the need for replacement pistons too, while the new manifolds were a flowing tubular design using both 29.5 and 32.5mm diameter tubes in inlet and exhaust applications. On top of the inlet manifold now sat a double barrel Zenith DINX 32mm carburettor. This upped horsepower to 19bhp@5000rpm, a gain of over 58% for a 2.6% increase in capacity – not bad, and no turbocharger in sight!

The little 2CV engine, an air cooled flat twin with a stroke of 62mm was not a heavy breather in standard tune, but with its hemispherical combustion chambers and increased compression it had some potential that was at the time very limited by the grade of fuels available. It also had a sealed crank that included the main bearings, meaning all capacity increases had to come via increased bores which might include new barrels and pistons. Consequently as capacity went up, so did the specific power output – i.e. the horsepower per cc tended to rise also.

On the top rung lay the 500cc model, the Umap 500 SM, that produced 26bhp@5000rpm with similar tuning specs to the 435cc engine but running a higher 8.3:1 compression; it also drew the highest price assisted by taxation. Consequently the Umap 435 SM was the one pushed by the company. Top speeds listed for the three variants were 95kph, 110kph

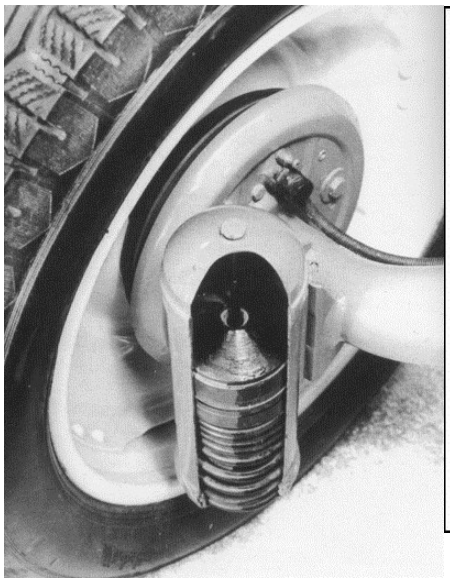


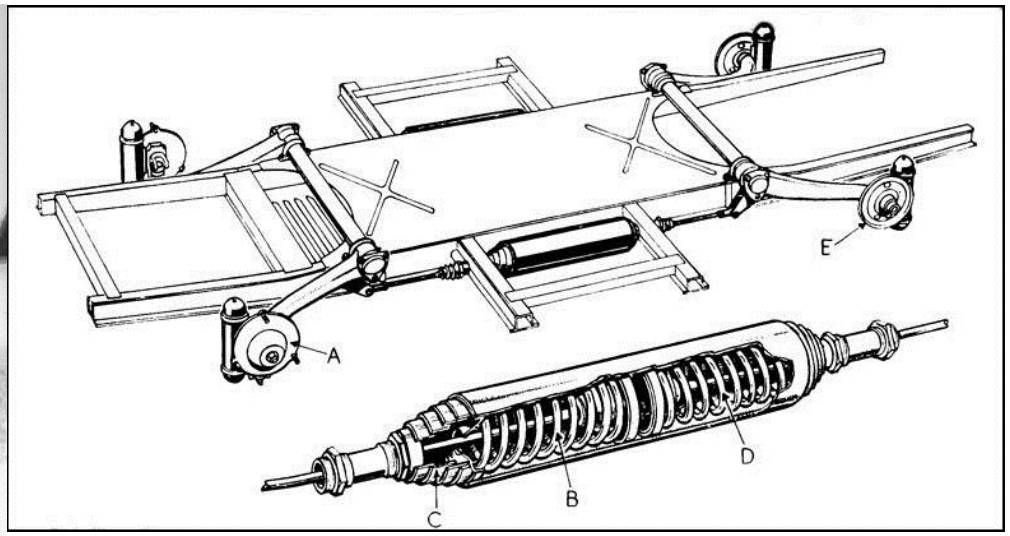
and 120kph for the 500 (59, 68, 75mph).

The Umap's bodywork was noted for the quality of its fibreglass in its outer finish, and its fit and laminate uniformity which resulted in a body-complete weighing only 41kg. Inside the car the dashboard was a moulded design that swept around into the door caps on each side, making full use of the advantages of GRP. UMAP's intention from the start was not to limit its components to the 2CV where quality *or* design might be inhibited. This resulted in parts used from such diverse sources as other Citroën's, Alpine and Renault - but I haven't yet been able to work out where the speedo came from!

The end result of this good laminating, the care with interior design plus the additional options from the RAF mechanical range along with the standard 2CV chassis and mechanical underpinnings was a mini GT weighing a quoted 500 to 526kg – a saving of 35 to 60kg over the original saloon.

When viewing the car pictured being thrown into a wild right hand turn one starts to ask, how can this be? So much roll, so much apparent understeer! To understand one needs to take a





Mass Damper left. Above: chassis and floating cylinder

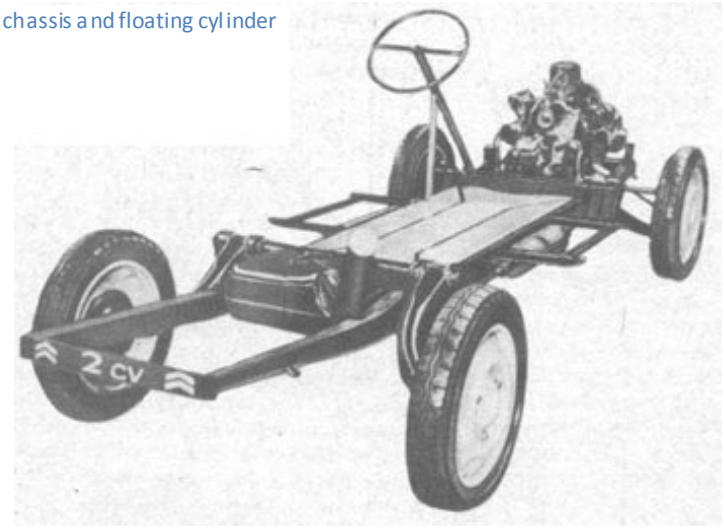
look at the philosophy and engineering behind the 2CV which underpins the Umap.

It was a suspension that has been described as being almost comically soft as a car could easily be rocked dramatically by a person in any direction they desired! It is a leading arm/ trailing arm design that is linked fore and aft. It was designed to keep unsprung weight to a minimum, and as such had inboard front brakes and inboard springs and dampers. It was designed by Alphonse Forceau to a brief that said the car had to be capable of meeting the needs of a rural community who might plough their way over farm fields to pick up a car load of sheep, then motor home one up on the highway…

The chassis itself is what can be described as a platform chassis of about 100mm in depth with a formed RHS style rail each side that tapered down at each end. It includes a crossmember at the rear and another both front and rear of the engine. On top of that, covering the passenger floor area is a swaged panel welded to the side members.

The suspension itself consists of two cylinders mounted horizontally on each side of the platform. Inside the cylinders are two springs, one for each for both front and rear wheels, mounted at each end of the cylinder. The springs are connected to the front and rear suspension arms via a pullrod or cable that is pulled by a downward facing bell crank that is a part of the inner end of each arm. These pullrods obviously work in tension and function by pulling through the inside of the coils located in the cylinders so that the springs are working in compression. They are connected to their respective coil spring in the middle of the cylinder via seating cups, with each spring being compressed independently against the outer ends of the cylinder.

In order to interconnect the front and rear suspensions, the cylinder each side is itself



mounted with a spring at each end between it and the chassis mount. These were original a slightly complex steel spring that was later replaced by rubber. Their purpose is to allow the cylinders to float. The effect is that it allows the front and rear suspension to interconnect with the internal coil spring acting independently for each wheel, and the floating cylinder acting interconnectedly for both wheels on each side. For example, when the front wheel is deflected up over a bump, the front pull rod compresses the front spring inside the cylinder, pulling it against the front end of the cylinder. This also compresses the front external (cylinder) spring, pulling the whole cylinder forwards. This action pulls the rear wheel down on the same side via the rear spring assembly and its pull rod being pulled forward by the forward-moving cylinder. When the rear wheel meets that bump a moment later, it does the same in reverse, keeping the car level front to rear. When both springs are compressed on one side when travelling around a bend, or when both front and rear wheels hit bumps simultaneously, the equal and opposite forces applied to the front and rear spring assemblies reduce the interconnection significantly, or even completely. This effect stiffens the suspension as body roll increases, and has the affect of allowing the 2CV to have very

soft "bump mode" absorption, without wallow or having uncontrolled float, while at the same time almost eliminating pitch.

As discussed in the De Pontac story, the arms are well controlled from deflection by large bearings at their inner ends, where they mount on the fore and aft suspension cross-tubes. This results in a high degree of suspension and alignment control. Also mentioned was the change in wheelbase length as the car rides bumps, corners and carries loads, which in the Umap's case is more pertinent than the De Pontac. This is because the car sits higher and rides on a stock 2CV chassis with the ability to squeeze four people into its interior. With the standard setup, the suspension arms reside at quite an incline from the chassis down to the wheels. Obviously then, when there is a vertical deflection upwards at a wheel, whether due to a bump or cornering, that wheel lengthens the wheelbase as it swings up in an arc. When cornering, both the outside wheels spread out lengthening the wheelbase up to 50mm at maximum travel, and swing in on the inside shortening it. Static caster angles are 7° standard that increase by up to another 8° at maximum upward travel, giving 15° in total..! There is no king pin inclination, but as seen in the picture of the car alongside the No2 Dagonet saloon prior to the l'Orléanais rally, and also on pg2 above, the effect of just 7° static caster when the wheels are turned results in them leaning in notably towards negative camber on the outside of the car and out towards positive camber on the inside; thus standing the front wheels more upright when the car rolls, giving the tyres more grip on the road. This tends to help negate understeer, which becomes more apparent on a fwd car, and is no doubt why some people report the cars to feel quite neutral even though they don't look it! It is said that with the engine, gearbox and major chassis parts all mounted down low, the 2CV centre of gravity is also low as a consequence… You certainly wouldn't think so looking at the cornering photos, but that is also a consequence of the trailing/ leading arm suspension's ground level roll centre position, and the super-soft springing.

Finally, in addition to the multi-plate friction dampers located at the suspension arm pivots, the mass dampers at the wheels filter out road harshness. The above suspension system would not work for modern stiff-walled wide tyres, not unless the springs were notably firmed up and the track widened to help keep the car flat. But combined with an inclined upper wishbone and a ball joint at the outer ends of each arm, the results would be different. It would tend to combine the comfortable ride effects of the 2CV suspension with wishbone geometry and raise the roll centre heights a little in the process.

In terms of critical dimensions, the 2CV on which the Umap was based is not unlike so many other small French cars of the era, being much larger than one might expect...

After the Paris show the Umap went back into hiding until around March 1958 when a handful of cars were presented to the press on the Reims-Gueux circuit by UMAP. Jean Dagonet took the opportunity to announce his retirement from the company in order to look after his health.

Umaps were used in competition, as seen by the number of cars with competition numerals on their sides. However, little is recorded about what they did, and in any case, they still would have been less popular in events than the Dagonet saloon, what with their greater purchase price and slightly heavier weight – the Dagonet was just 490kg. Some reporters in later times have also criticized the little car for the soft suspension and lack of power compared with period small Italian sportscars. Yet to be fair, in order for the suspensions to work as expected, old cars need to be kept up to scratch. If the dampers have worn out and gone soft, the effect would be a wallowy ride. And with respect to performance, 75mph from 500cc was quite good for the time; it was in fact a little GT, not a mini racecar…

As a comparison, a 1958 FIAT 500 Abarth Zagato with its 479cc, 66x70mm longstroke twin tuned to 21bhp from an original 18bhp with an 8.7:1 compression, 26IMB Weber and weighing 445kg dry, 465kg with fluids (very good!) due to its alloy Zagato GT body, had a 110kph/ 68mph top speed and a 0:60mph time just under 40 seconds (500kg and 90kph for the standard FIAT saloon)… Its little FIAT 500 floorpan on which it was based was *much* smaller than the Umap's 2CV base too with a 72.4" wheelbase and front/ rear tracks of only 44.1 and 44.7 inches. The Zagato was also said to have a Cd of 0.4; its power to weight would have exceeded the 435 SM, but trailed the 500 SM at 45.2 versus 49.5 bhp/ tonne. It was only a 2 seater too, so apples for apples the 2+2 Umap stacked up OK.

Martin, Dagonet and UMAP had hoped that Citroën would see merit in their little car even if just to enhance the 2CV range, but Citroën, like most larger French and British auto companies, had a principle of *not* helping others in any way possible, which they steadfastly maintained. Thus UMAP had to source brand new 2CVs, remove their bodies and sell what they could, then build their own car on top. This is what made them so expensive – at almost the price of a new ID Citroën, and so severely limited their potential to sell in any numbers. By early 1960 production had ended. An original batch of 100 were planned but the official number sold was 50; some reckon the actual number is even less, which again was another French opportunity lost. Rather extraordinarily the company survived, and at the time of writing some 50 years later, it is reported to still be trading, albeit not making cars!

2CV Saloon

Length: 3830mm 150.8"
Width: 1480mm 58.3"
Height: 1600mm 63.0"
W/base: 2400mm 94.5"
Track f/r: 1260mm 49.6"
Tyres: 125x400 Michelin Pilote
Weight: 560kg
Engine: 425cc, 12bhp
Gearbox: 4-speed, syncro 2, 3, 4

Umap 2+2 Coupe

Length: 3900mm 153.5"
Width: 1500mm 59.1"
Height: 1400mm 55.1"
Wheelbase: 2400mm 94.5"
Tracks: 1260mm 49.6"
Tyres: 125x400 Michelin
Weight: 500-526kg (dry/ fluids)
Engine: 425cc 14bhp, 435cc 19bhp, 500cc 26bhp
Gearbox: same 4-spd transaxle

French GT vs. Italian Sports Coupe !!