Gerry Bath and his Specials

During the 1950s and 1960s, with new sports and racing cars very expensive and hard to come by, many British enthusiasts took the route of building their own "special", utilising cheap secondhand and old parts often sourced from scrapyards. Some, such as Colin Chapman and Eric Broadley, went on to much greater fame, establishing marques such as Lotus and Lola. Many, many, others just spent countless satisfying hours creating, then driving, and even racing, cars which they'd built with their own hands.

One such enthusiast from Bath in northern Somerset was Gerry Bath, a young engineer who built several "specials" of his own. A member of the Bristol Aeroplane Company Motor Club since 1955, his story of constructing four such specials, "The Confessions of a Special Builder", reproduced below, first appeared in the Club magazine "Backfire" in 1966 and 1967.

The Confessions of a Special Builder
By Gerry Bath

Raleigh 3-wheeler

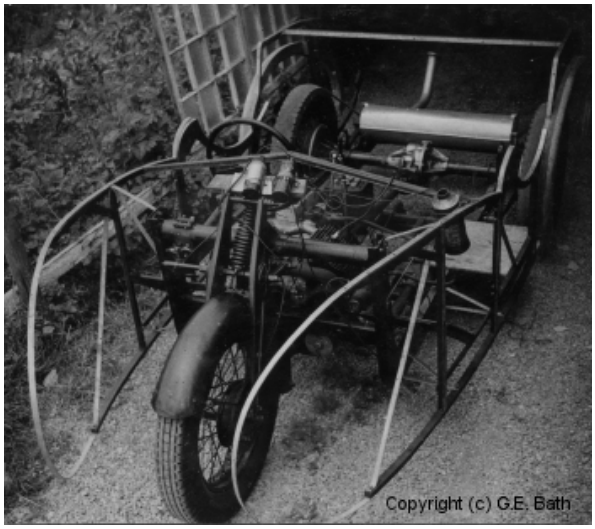
From a very tender age I was interested in designing motor cars, I inevitably wanted to drive and own one as soon as possible.

As 3 wheelers could be driven at the age of 16 this was to be my choice the only remaining thing being the type and make.

The Morgan was an obvious choice but in the early post-war years, all cars were fetching astronomical prices and so I decided to build my own.

Before the war my father had owned a Raleigh 3 wheeler and I eventually located a complete chassis of this type near home for 25 pounds which I purchased. I had by this time designed a streamlined body for a car with the one wheel in the front and when I obtained the chassis I drew the body out full size on the back of old Wallpaper.

I then had to decide on the method of construction and eventually I made the shape in 3/4" x 1/8" galvanised M.S. strip with wood bolted to it onto which I attached the aluminium sheets. (This was before everybody used tubes).



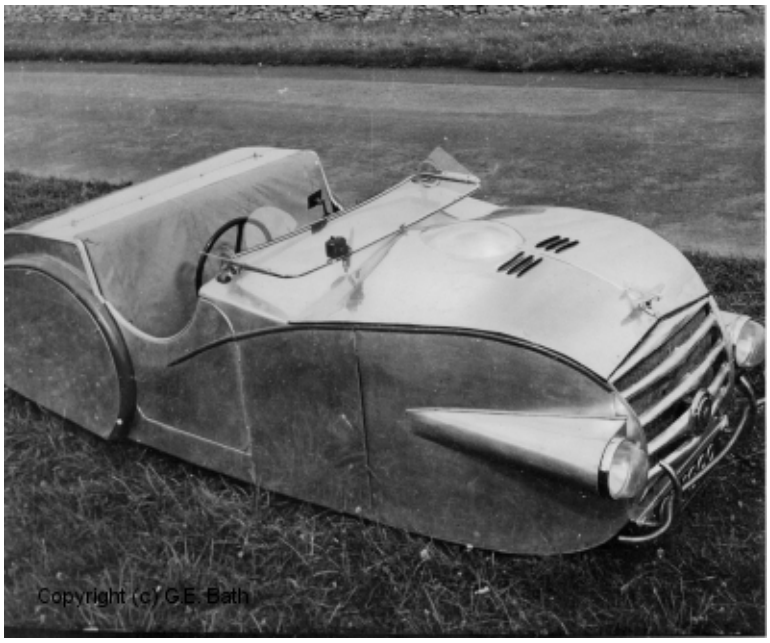
The design was for a car seating 3 abreast with enclosed wheels and faired in headlamps but capable of being made without any panel beating except for a fairing over the top of the front forks. While I was building the car the owner of a local car breakers saw my efforts and offered me a windscreen free of charge. The engine in the Raleigh was a 90 degree V twin side valve air cooled engine of 750 c.c. integral with clutch 3 speed crash gearbox all lubricated by the same oil in 1935! But the sump was held on with 40 bolts. The rear axle was mounted normally on 1/2 elliptic springs but had an alloy centre housing but as it was a van chassis, was equipped with a 6.25 to 1 crown wheel and pinion which I eventually changed to the car ratio of 5.5.

The chassis was of channel section with tubular cross members and front forks were pressed steel with a central coil spring.

The car was eventually finished after 20 months and 800 hard hours as no power drill was available and was first driven by a mechanic on trade plates. The first problem came when I tried to tax it as it had to be weighed and not exceed 8 cwt. I was not aware of this at the time.

As first weighed it was about 9 cwt but after removing everything removable it was eventually reduced to 8 cwt. and was taxed and insured.

On my first trial run, accompanied by a friend from the garage where I worked we set off up the long hill from my house to Charmy Down and on to the Cold Ashton cross roads. I then heard a noise which sounded like a blown exhaust manifold gasket and stopped to investigate. Instead of the blown gasket there was a hole in one of the alloy cylinder heads alongside the plug. I drove back some way on one cylinder and then obtained a rapid tow behind a lorry to home. The engine must have been overheating and so I replaced the fine mesh grille at the front with a much coarser mesh and finding the plugs were too short a reach, replaced them and had the hole in the cylinder head welded up. After this I experienced no more trouble but found the engine very rough after being used to 4 cylinders. Another major fault was that the Ferodo clutch was running in oil mist and would not free when cold and would slip when hot.



Being interested in Motor Racing I made a trip up to Prescott Hill Climb where Mr. Walker of Walker and Ward of Cheltenham was interested in the design and thought of producing it on a Reliant chassis. Unfortunately he could not proceed with the idea as all the available Reliant chassis were being used for their vans.

After some months use I decided to replace the Raleigh engine and gearbox with those from a Ford 8 which would fit quite readily. One of the small radiators from a very early Austin 7 was used together with a multi-blade fan and this kept the engine cool.

This modification was very successful from the performance and smoothness aspects but I then found the front fork spindles broke rather too regularly, due presumably to the increased weight on the front wheel and my rather spirited cornering which imposed a torsional load on the spindles. I found spindles made from old Ford drag links lasted just as long and were a lot cheaper than the correct replacements.

When my father borrowed the car one day he had a conversation with Mr. A. C. H. Harding an R.A.C. Scrutineer and one of the founders of the 500 c.c. racing movement in Bristol, who was interested in the car and asked me to go and see him. It was this and subsequent meetings with Mr. Harding that really made me think of building and racing my own car to be described in the next instalment.

Specification:
Wheelbase --- 6ft. 8 in.
Track --------- 4 ft.0 in.
Length -------- 11 ft.6 in.
Width --------- 4 ft. 9 in.
Height -------- 4 ft. 4 in.
Capacity ----- 742 c.c.
Bore ---------- 75 m.m.
Stroke -------- 84 m.m.
B.H.P. ------- 17 @ 3,000 r.p.m.

Pegasus - NYB 66

Whilst I was working at the Bath Ford agents, one of the Storemen rebuilt a Triumph Super 7 with the best parts of two cars. I bought the parts he did not want to keep, which included the front and rear axles, hubs and brakes, which were 10 inches diameter hydraulic, also wheels, the chassis frame, springs and steering column.

With this as a starting point, I designed an I.F.S. system using the rear springs mounted across the front of the chassis frame using an old Ford front cross member. Radius arms made from Ford drag links ran from below the chassis to the eyes of the lower leaf spring. The kingposts were made from Fordson Tractor track rods, which were fork ended to mate with the spring eyes and were machined to pass through the holes in the stub axle intended for the king pins.

A Ford steering box was mounted on the chassis and another one was cut to provide bearings for the slave arm & mounted on the other side of the chassis. This gave a 3 piece track rod system, the geometry of which was very close to that of the lower leaf spring under wheel deflections.

The chassis frame of the Triumph 7 was one of the later pattern to take half elliptic rear springs, so this was cut, forward of the arch, and quarter elliptic springs, made from Ford front springs, was fitted to the chassis. Further location of the rear axle was provided by radius arms whose pivot points were friction shock absorbers. Before going to this system, I made an A bracket from Ford drag links attached to the sheet metal cover over the differential. This tore away the first time power was applied, giving me my first experience of torque reaction!

My first idea for a power unit, was a spare Raleigh V twin engine and gearbox unit I had available. My original idea was to produce a hill climb special inspired by the cars I had seen at the Naish Hill Climbs at Clapton in Gordano. (Incidentally, I was a spectator at the first Naish Hill Climb to be run after the war, 1946 I believe, which was itself about the 2nd motoring competition to be run. It included an R type M.G. in the entry)

The idea of using the Raleigh engine faded when I had more experience of the three wheeler and I decided to use a Ford 10 engine and gearbox. The gearbox was fairly easy as I was able to accumulate enough useable parts from the scrap heap to make a complete gear box.

The engine was more difficult as Ford 10's were not easily come by and I eventually found an ex-Ministry engine, less sump, timing cover and head. I had this rebored and although the crankshaft was rusty, I only lapped in the journals with emery-cloth, leaving the rust pits as oil retainers and they gave no trouble at all.

The engine and gearbox was mounted in the frame with one of the larger Austin 7 radiators ahead of it.

The next problem was the rear axle which was one of the worm type giving a ratio of 6.5 to 1. This was eventually overcome by fitting another Ford gearbox behind the first, but the other way round so that it geared up instead of down. Only 2nd and top gears were left in this box, which in “overdrive" gave a ratio of 3.75 to 1, which, with the 4.50 x 19 tyres gave very high gearing.

I took the car in this form to a Bristol M.C. & L.C.C. practice day at Castle Combe (minus body) in April 1951. (Those were the days!) I realised from this that the gearbox set-up was unsuitable and also learned the damage that can be done to a car by vibration when a carburettor fell off and a gearbox casting broke due to vibrations caused by the prop’ shaft running untrue.

I soon managed to obtain an Austin 7 rear axle quite cheaply from the local garage which was quite suitable as it was designed for 1/4 elliptic springs and the Austin wheels were the same size as the Triumph. This axle was fitted by June 1951 and a start made on building a body. Most of the work was completed by August by working during a fortnight's holiday and the car was on the road, taxed and insured as a Pegasus.

A new Crown wheel and Pinion had to be fitted to the axle as the existing ones were damaged. The performance and roadholding was very good and was improved still further when some shock absorbers were fitted to the rear and a pair of Ford 8 carb's on special inlet stubs were added to the engine.

My enthusiasm for the performance led one of the other mechanics, who was the proud owner of a Matchless 500, to say that he could give me a 50 yards start and catch me within 1/4 mile. There was only one way to prove it, so we assembled one evening on a long straight level stretch of road at Combe Down and proceeded with the contest. The outcome was that it took him something like 3/4 mile to catch me!

My first official competitive event was at Naish Hill-Climb, Sept 1st 1951 and the following week I entered for some Driving Tests. In both events I was unplaced.

During the winter, the rear axle became more and more noisy and on stripping down was found to be badly damaged due to having been meshed incorrectly. Another expensive lesson had been learnt as they cost me 8 pounds. By this time I was working at the B.A.C. and through various contacts I had the two teeth of the original pinion built up with stainless steel which were filed to something like the right shape and reassembled. Anyway, the axle gave no more trouble whilst in my possession.

My first race was at Castle Combe on May 3rd 1952, when I finished 6th out of 10 in pouring rain and suffering from clutch slip. The class in those days was sports cars up to 1200c.c.

The other event in 1952 was a race at Thruxton on August Monday when it rained again going to the start line and although I made a good start from the front row of the grid, which was obtained by ballot, I was wearing goggles which soon steamed up and I was unplaced. Since when I have always favoured a vizor, at least in England!

1952 was also the year when an old Ford 8 van of 1939 vintage was purchased in June for 111 pounds and was intended for everyday use. The Raleigh was eventually sold in July.

A few modifications were carried out during the winter including replacing the upper front transverse leaf spring by fabricated wishbones, making up adaptor plates to enable the 17” wheels from the Ford van to be used on the Austin hubs.

One of these adaptors failed in practice for a race at Castle Combe in April 1953 when a friend was driving and the wheel came off right in front of the paddock. The failure was mainly due to poor welding (which I had not done myself) so I did not bother with adaptor plates again.

We both drove at a sprint at Staverton, near Cheltenham in May, this time without incident, I recorded the time of 37 secs. I think the distance was a Kilometre.

My most exciting event was at Naish Hill, in June when I recorded exactly the same time as Ashley Cleave in his well known Morris Special. This meant another run each but, although we both improved on our previous runs, the times were still the same. The next runs were yet faster, but still the same and it meant yet another run off to decide the tie. On this attempt I was a fraction faster than Ashley Cleave and so I won the class. I was not so lucky at the September climb and finished 2nd in class.

This was the last event I did with the car as I had decided to sell it, which I eventually did to someone in Chester, but I did see it a couple of tines afterwards when I was at Oulton Park.

Ford Special - GL 6877

In December, 1954, I became the proud owner of a new Ford Thames 5 cwt. Van, and as the value of my old Ford 5 cwt. was by now quite low I decided to convert it to a Ford 10 special. It was already some way there as it was fitted with a 10 H.P. engine with 8 H.P. cylinder head, 4.7 to 1 Crown Wheel and Pinion which had been obtained quite cheaply second-hand, telescopic front shock absorbers and an anti-roll bar at the rear.

The first job was to remove the body which was riveted to the chassis. This was soon done but it revealed some unintentional holes in the chassis. These were quickly made a more regular shape with a file, and left as lightening holes.

While this was being done various body designs were drawn out, and I eventually decided to try an all enveloping body but using all single curvature panels so that no panel beating was involved. The only exception was the fairings over the rear wheels, which I managed to do myself.

To keep the car as low as possible the floor rested on the bottom flange of the chassis with the occupants seated between the chassis side members and the torque tube enclosing the drive shaft in the middle. This was possible as the side members bulged out just ahead of the rear wheels. This low floor line meant that something had to be done about the bracing tubes that run

from below the torque tube to each rear nut. I noticed that Lotus' had omitted them when using a Ford rear axle I decided it was worth taking a chance and do the same.

The only other alterations to the chassis was to remove all the leaves in the rear spring above the clamps, and to fix a [complete] ball bearing in the centre of the front axle beam running between vertical guides attached to the front spring attachment bolts on the front cross member. This was to prevent the car moving sideways on the spring shackles during cornering upsetting the steering, especially noticeable on a Ford as the drag link from the steering box runs across the car. Other small modifications were to lower the steering column and fit a remote gear change. The base of the gear lever was a steering ball joint actually clamped to the torque tube which moved with the rear axle, but the movement was so small that it was never noticed.

The design of the body can be seen from the illustrations above. The bulkhead & dashboard was similar to that which I had evolved for a monocoque sports car earlier (which was never built) & stiffened the chassis in this region. The cut off "Manx" tail was just then becoming popular on cars such as the Cooper 1100 and was very easy to make.

Most of the bodywork was again made in my holiday in August 1955 and I was very pleased to find that the complete car only weighed 8cwt in spite of using standard components.

The first competitive event in which the car was entered was the Naish Hill on September 17th and I was very happy to obtain a second in class as the car was fitted with a standard inlet and exhaust system. This I thought was support for one of my favourite sayings, “Simplicate and add lightness"

However, I decided to try to improve the performance by using a double choke Stromberg carb’ which had originally come from a 30 h.p. Ford V.8. A manifold was made to take this carb' and a four branch manifold was obtained from a friend for the exhaust. The carb' was modified to take Amal jets and the car was tried out on the road. The initial acceleration was very good, but after about 200 yards, misfiring started every time. This was eventually traced to the fact that the mechanical fuel pump was unable to cope with the demand, so an S.U. electric pump had to be added. However, the performance was never as good as I had expected and the only event in which it was used was a sprint in May 1956 at Staverton, when the manifold came apart. I was able to drive home with it tied together with wire.

The standard breathing system was refitted with the exception of the exhaust manifold which was retained for a sprint at Castle Combe towards the end of May when another second in class was obtained and in July I managed to win the class at a sprint at Long Marston. In this form the car would achieve as much as 50 m.p.g. on a run to and from and including a meeting.

Soon after this I decided to “retire” again and advertised the car in Motor Sport for 90 pounds which was cheap in those days for a Ford 10 special. The car was sold the same day to a chap from Reading who was passing through on his way to a holiday in Cornwall, in the course of the following week I received over 80 replies to the advert'.

Gerry’s modified Ford Thames van (August 1958), used on numerous club rallies of the period.

750 Formula Special - 21 VYB

After selling my last Ford Special I decided that I would not build any more as the chance of success in competition seemed to be getting less with the increasing numbers of Lotus cars.

However my resolution was undermined when I heard of a 1931 Austin Seven going for 5 pounds, as the police had requested the owner to remove it from the gutter and the entries in the 750 formula races were still composed of home built specials.

I towed the Austin home one evening with the help of a friend who had the excitement of steering and stopping it. The first job was to remove the body, which was more difficult than I would have thought, looking at the car. Soon after acquiring the car I was given a chassis from a later model with a longer wheelbase which meant using a rear axle with a wider track. As the rear axle in the car had a damaged pinion it meant getting another axle anyway and I eventually found a good one for 3 pounds 10 shillings. Amongst the useful items collected over the years was a pre-war Fiat 500 front suspension and steering and brakes. This looked ideal for fitting to the Austin chassis so a sub-frame was drawn and made that bolted to the nose of the Austin and carried the suspension - For those not familiar with the Austin 7, the chassis is roughly in the form of a capital letter A. The original transverse front spring was attached to the apex and the 1/4 elliptic rear springs were an extension of the side members. To race in the 750 formula the Austin side members, rear axle, l/4 elliptic, rear springs, engine and gearbox must be used, but any front suspension was allowed. A pair of Fiat front wheels complete with 3.50 x 15 Dunlop Racing Tyres and tubes were eventually located and bought for 6 pounds, the suspension had cost 3 pounds. This then put the chassis on four wheels once more but did not include any of the original Austin 7.

When designing the car I thought it would be useful to be able to fit a Ford 10 engine at a later date and to facilitate this, I position the gearbox about 15" behind the clutch in a similar position to a Morgan. This brought the gear lever nicely to hand and saved the trouble of making a remote control. A change of engine would then only entail a new shaft connecting clutch to gearbox. Fears that the inertia of the shaft would hamper the gearchange was therefore unfounded in practice.

A start was then made on the frame for the body. The basis was a 2" dia tube bent to the shape of the body and positioned just ahead of the scuttle. This tube was originally on Geoff Brown's special, consisting of a Vauxhall engine in a Singer chassis which a friend of mine bought and then fitted a Falcon fibreglass body. This saved me a lot of trouble as bending 2" dia steel tube is not easy.

Additional 1" dia tubes attached half way up the main tube on each side ran diagonally fore and aft and were attached to the side members giving greatly increased beam strength and torsional stiffness to the chassis. The aluminium floor was also riveted to the flanges of the chassis to form a box and again increase torsional stiffness. The side members of an Austin 7 Chassis are of top hat section. The car had reached this stage by 1959.

All this was made a lot easier as gas welding equipment was available at home. The rest of the body framing was made of oval section conduit which was fairly light and easy to work.

By this time various other useful items had been acquired including a crankcase and cylinder block fitted with a high lift camshaft reputedly Austin Grasshopper, from Terry Sanger and alloy head, sump, large capacity oil pump and four branch exhaust system from a man at Beckington. The cylinder block had large inlet valves fitted but had been bored to 080" O/S and one bore had cracked.

I had this one bore sleeved and "bored to .040" O/S and weighted the piston to match the other three. This also worked quite well in practice.

In the Sales at the Car Division a pair of Telaflo telescopic dampers and a pair of Solex downdraught carburettors, complete with streamline section butterfly valves, were bought. The dampers fitted the front suspension but the carburettors were not so successful and were eventually replaced by a pair of 1 1/8" dia. S.U's.

Work on the car had been going very slowly due to other commitments and the fact that the small jobs always seemed to take longer than the big ones. However when more time was again available I made an effort to get it finished and by September 1963 it has a body and looked a bit more like a motor car.

From September 1963, when it first looked like a Motor Car, the next few months were spent mainly on details such as lighting, horn, etc and in trying to make sure that it complied with 750 formula reg's and would pass the Scrutineer at the following season's races.

It was fortunate that Castle Combe was in use again as a racing circuit and my first event was there on July 18th 1964. The meeting was uneventful except that the car suffered from overheating when driven flat out for some time in the warm weather. This meant slackening speed towards the end of the 5 lap race and I finished 12th.

The next event was again at the "Combe" in the form of a Sprint, August 29th when I won the Class. This was a hollow victory, however, as there was only one other 750 class competitor. This was the end of the 1964 season and, to date, the car had only cost 90 pounds.

It was obvious that the car must be made to go faster for the following season and I again considered the beat way to do this was to make it lighter. This was quite a problem as there was nothing "surplus to requirement" on the car to start with and it weighed only 7 cwt in racing trim - my lightest yet. However, some weight was saved by making a small 1 gallon fuel tank fitted just in front of the dash to replace the weight of the S.U. fuel pump and 5 gallon tank.

The cycle type mudguards were of steel and so the front ones were replaced by aluminium ones. The rear ones were left as they were part of the body structure! The original Austin 7 seat was still used but with the minimum of upholstery and large diameter holes cut everywhere I could find room. A motor cycle combination battery was acquired for use in races only for 30/-

and the Austin dynamo was eventually replaced by a small electric motor driven by a large 'O' ring serving as a belt, from the shaft between the clutch and the gearbox. All this eventually brought the weight down to 6 1/2 cwt.

I had also decided that the car was too high geared. The easiest way of correcting this was to fit smaller rear wheels than the standard 4.50 x 17 on the car. A pair of Austin Big 7 16" wheels were “in stock" but these were very heavy and not really small enough so a visit to Old Baker procured a pair of 15” wheels from a Renault 750. These were really little more than rims, so the rims were removed from the Big 7 wheels, the wheels reduced in size and the Renault wheels bolted on. Surprisingly enough, these wheels were reasonably concentric & true and were soon equipped with some second hand 5.50x15 Dunlop racing tyres advertised in the 750 bulletin,

I thought I had better then pay some attention to the engine, so it was stripped for an examination, When the crankcase and cylinder block, had been obtained from Terry Sanger the camshaft gear had had another keyway cut in it to give a half a tooth advance, but I had been running it with the standard timing so I decided to give the other position a try. As it turned out, this gave a great improvement in performance.

Another cylinder block was now available, so this was bored out to .040" oversize and the ports opened out to take larger inlet valves. The timing cover was also modified to mount the distributor so that it was driven directly from the crankshaft and not by the gear driven dynamo as on the original Austin. This was done mainly because everyone else did it but also because it should give better control of ignition timing.

An additional water offtake from the cylinder head to the radiator header tank was fitted to help to overcome the overheating problem, but, more important I think was the blocking off of the overflow pipe and replacing it with one going to a small catch tank on the bulkhead together with a water tight radiator cap. The reason for this mod' was I had read in the 750 bulletin was that when braking for a corner the water in the top hose which was nearly horizontal would rush to the header tank and would go down the overflow, thus reducing the water level and causing overheating. After this mod' it was never a real problem, although the water temperature was only just below boiling point when racing. I have never believed in water pumps as they use those last few horsepower that take so much obtaining.

The finishing touch was given with a coat of bright red Valspar and the car was ready again. The first tests were encouraging as the performance was greatly improved, but disaster soon struck when the big ends started knocking, however, they lasted long enough to get me home.

After consulting that useful book, “The Special Builder's Guide" produced by the 750 Motor Club, it appeared that the big end failure was due to the oil jets which squirt oil at the big ends not being lined up correctly with the holes in the crankshaft. The engine was stripped down again and the necessary mod's carried out. There was no recurrence of the trouble.

I was now interested to see what effect the winters work had on the performance and entered for a race at Castle Combe on July 3rd. The result was 10th place at a race average of 61.8 mph. The next meeting on July 17th gave me 8th place at a race average of 61.3 mph. Fastest lap was in 1 min 45.2 secs, 62.97 mph.

As it turned out this was my last race with the car. I tried to sell it that summer but without success so the winter was used to examine the big ends, which were O.K., and to modify the shape of the inlet ports and to streamline the carburettor butterfly valves with Cataloy. The carburettor pistons were also lightened as it was possible that they were not opening completely on full throttle. One or all of these mod's resulted in the car going a lot worse than it had before. Most of the trouble was cured by fitting springs above the Carburettor pistons to replace the weight I had removed but soon after this I found a customer and the car was sold for 60 pounds in 1966.

When the car was first designed in 1957 it was fairly typical of 750 Formula cars racing at that time but when it was built and had years of development it was 1965 and it looked huge in comparison with the ultra low cars on Mini wheels. Even so, it was not last and finished in each event and I even had some points in the 750 championship.

This brings my account of 20 years of special building up to date as I am not actively engaged on a project at the moment, although pencil is often applied and an M.G.1100 engine and gearbox unit has been acquired. I am convinced that the time and money spent on a car for racing is out of all proportion to the amount of enjoyment derived from it and any future effort will be on a car for use every day and will have a roof attached.

Perhaps I am just getting old!

G.E.Bath.

Gerry sprinting his modified Minivan at Locking in 1969

Gerry subsequently did build another special using that MG 1100 engine and gearbox, the Mini-based, mid-engined, targa-topped, Minim GT, which he used on the road and in competition for many years. In 1994 he provided a short description for Backfire:

The Minim was built using a 1963 Mini van. The body was removed to use the floor and front bulkhead, together with the front sub-frame and suspension. Another front sub-frame was attached at the rear of the floor to carry rear suspension and engine unit. The brakes have separate circuits at the front and rear, with Cooper S discs at the front.

The sills were made of Duralium & the body is made from aluminium incorporating a steel roll-over bar. Various engines have been used, starting with a 1098cc & then fitting a supercharger, but it has mostly run with a 1275cc unit with twin 1.5" SU carbs.

Work started in December 1970 & it was first used on the road in September 1972.

Prescott hillclimb, March 1974

Gerry died in 2014; the following year three trees were planted in his memory at the top of the paddock at Prescott hillclimb. The Minim is now in the sympathetic care of another west-country enthusiast

Read James Page and Mike Marsden's memories of Gerry here (pages 26-28):
https://bristolpegasus.com/wp-content/uploads/backfire-august-2014-ebook-version.pdf

and James Page's Classic & Sportscar blog on Gerry here:
http://www.classicandsportscar.com/blogs/james-page/remembering-a-builder-of-extraordinary-specials

Pete Stowe 2020

