

Pioneers of Air-Cooled Racing: More on Ron Tauranac as Tony Caldersmith analyses RALT 1

LOOSE FILLINGS

The first Ralt had some mistakes, but it was soon developed into Australia's most significant locally-built 500cc racing car.

Racing cars have generally been divided into two camps; the factory produced cars and the individual special builder's car. Occasionally the odd special builder showed such talent that he graduated to multiple production and became a recognised successful manufacturer. Ron Tauranac is a member of the latter group and starting out with a clever special, became a major force in racing car design and production.

To get into racing in the early post World War 2 years, there were two alternatives; you had to have plenty of funds and bought an existing car, or if you couldn't afford that, you designed and built your own car (a 'special'). The Tauranacs took the latter approach.

Australian specials at the time were mainly obsolete European racing cars

using large American motors or stripped production cars, as opposed to England where the 500 movement was thriving, with people making light cars, using motorcycle engines. When Ron and Austin decided to get involved in racing their approach was to design and build their own car and it was a remarkable achievement that showed a high level of design and clever thinking.

Using the light car option meant you would need to minimise the weight and maximise the handling. Invariably that meant a minimal chassis frame and independent suspension. Earlier triers using basically lightened Austin Seven components soon learnt that you needed to be more sophisticated to get the real advantage of a light competition car.

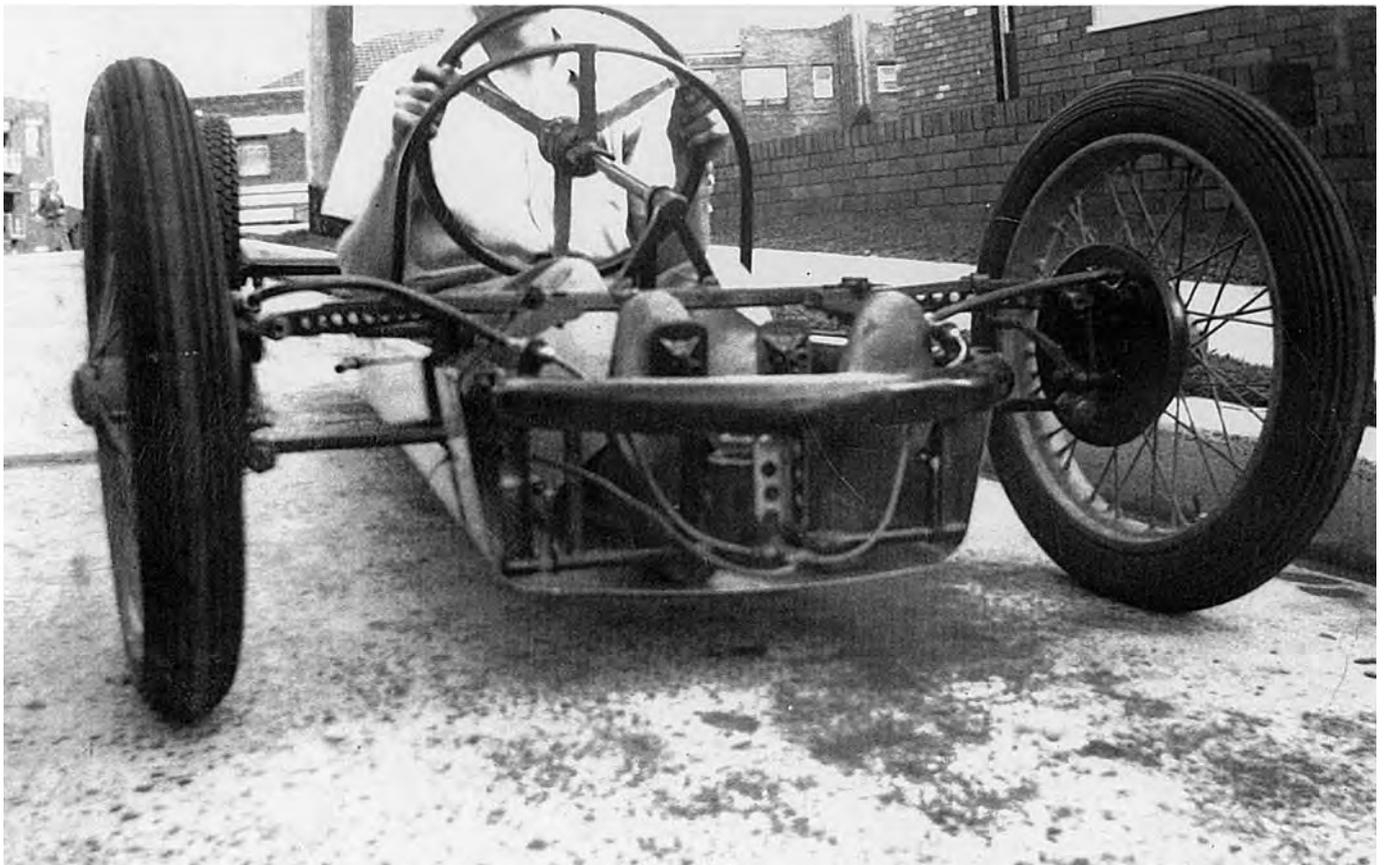
An effective suspension was the real test.

There were plenty of designs to consider, including twin wishbone, Morgan or Lancia's sliding pillar, trailing arm, transverse leaf-spring and split axle. There was not a lot of detail available on the more technical aspects of these alternatives, such as roll centres and swing-axle lengths, but Ron is known to have studied the available literature and decided on what suited the sort of car and performance he wanted. Typically, like any one starting out in competition, the lack of experience would be the stumbling block that made it difficult to select the most appropriate design first time up.

The first Ralt's basic design used a 2" tubular ladder chassis, wishbone and transverse leaf spring front suspension with a

Below: the initial rear suspension configuration with short swing axles and no dampers.





swing-axle rear suspension also supported by a transverse leaf spring. The chassis was a main tubular loop starting at top wishbone level at the front and sloping down to the lower pickup for the rear swing axles. At the front there was an additional structure to mount the top leaf spring and the steering and lower down, the pedal pivots and inner wishbone pickup points. A small triangle supported the front end of the steering column. The rear suspension comprised quite short swing axles and used light tubular wishbones pivoting on the same line as the axles' universal joints. There were no signs of dampers on either the front or rear suspension on the car's early appearances and it is reported as running in this form at its first outings.

The front suspension's geometry using a top leaf spring as the upper control arm mirrored Cooper's design and therefore suffered the same failing, in that the resultant geometry has the longest actuating arm on the top. This means that on roll, the outer wheel will not only mirror the chassis' roll angle, but exaggerate it. However, it appears that the main masses of the car were quite low slung and, combined with the high mounting of the front suspension, little adverse effects might have been evident in action (as Cooper found).

The positive camber of the front wheels would also exaggerate that disadvantage and may have been designed to provide an understeering characteristic. Wheels were 19" wire fitted with motorcycle tyres.

Ron's first outing in the car was on his way to the Hawkesbury hillclimb west of Sydney when he had a bit of private practice en route. The combination of the undamped suspension and short length swinging arm rear axles suspension made the car very unstable and difficult for a novice (as Ron was then). The result was a serious accident.

Ron only drove it once more in that form and had a further accident, before fitting the shock absorbers and revising the rear suspension to turn it into a low pivot swing-axle that reduced the camber change needed to reduce the car's sensitivity and improve the handling.

The new arrangement would have provided a swing angle length of approx. 15", almost double the original. It also lowered the roll centre and substantially reduced the jacking problem that would have been a major contributor to the car's adverse handling.

The two inboard pickups for the rear lower wishbone were not parallel with the car's centreline, but were located on the limited structural options, at the rear near

the centreline, and on the chassis well forward of the rear wheels. While this might have generated a small amount of bump steer it would have been limited by the moderate suspension movement and provided a major improvement in driveability.

The trailing arm that formed the forward part of the lower suspension underwent modifications over a period, probably to improve its rigidity. The original arm was quite long and made from small tube. It was later boxed in and had a speedway style "knerf bar" added, which was probably more for adding strength than providing a safety feature.

As part of the rear suspension change, the new rear suspension not only included new thinking in its low pivot arrangement, but also included a new rear wheel hub that included a mounting for the driveshaft outer universal joint, maximising the length of the driveshaft and minimising the angles the universals had to work through.

The universal joints of the original drive shafts, which were quite short, would have had to go through severe angles during suspension movement, which was not conducive to UJ life and smooth power delivery. The new design moved the outer UJ to the outer end of the wheel hub delivering its power via a spline mounted on the outside end of the wheel hub, thereby

minimising the angles the UJs would work through and minimising power loss.

This rear suspension change was probably when the wheels were changed from 19" wire to his own design of 15" cast alloy. 15" wheels meant that Ron could take advantage of proper racing tyres, which were not available in 19".

The front suspension was sufficiently well located to resist the braking forces and appeared to remain largely unchanged other than the addition of tubular shock absorbers. In some early photos there appears to be a drilled top lateral location arm, which does not appear in later versions. Ron may have been unsure about the spring's ability to act as the locating component for the front suspension initially. There is no sign of the drilled locating arm in later photos, although the spring looks much beefier than in the early shots. Ron may have taken the "Cooper option" and dispensed with the locating link.

The chassis itself seems to have remained basically unchanged, other than making modifications for the new suspension and the simple and clever bodywork remained the same, except for minor additions to the windscreen and rear view mirrors. These are difficult to position on a 500 and to isolate from the inevitable single cylinder vibration.

In this evolved form, the car was very successful and had a number of successes in both Ron's hands and its subsequent owners.

The success of Ralt 1 was the result of detailed thinking by Ron at a time where development usually meant making a car lighter and finding ways to increase the horsepower of the engine. Developments in handling and suspension were rare in specials and Ron came up with a design that would have been at the leading edge, if he had presented it in the UK at the time.

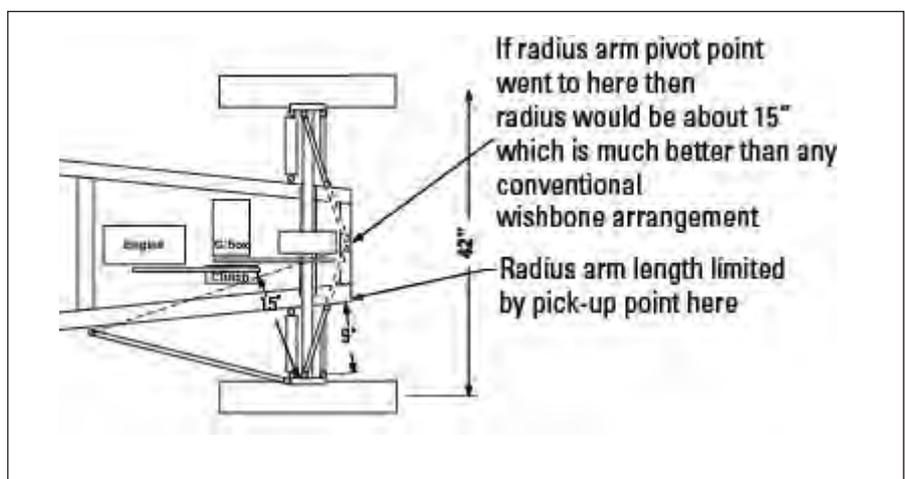
It is interesting that the following Ralt cars retained almost none of the features of Ralt 1. These cars moved to multi-tube frames and twin wishbone suspension and displayed to very rapid design developments that were to be a feature of the '50s

Top left: early front view with the large diameter wheels and motorcycle tyres and no dampers.

Top right: the later evolution of the Ralt with 15" alloy wheels and revised suspension.

Middle right: Bert Bartrop at Nowra hillclimb on 2 November 1958.

Right: the diagram is not accurately to scale but it aims to show how the effective radius of the rear suspension was increased compared with the original.



COOPER CARS AT COLLINGROVE ...

If you Google ... *Collingrove Hillclimb Records* ... and follow the prompts, you will find some interesting stuff there showing how dominant Coopers and Cooper copies were in the early hillclimb days. Check out the following list of ftds made at the SA Championship meetings from 1952 to 1963.

1952 John Crouch, Cooper JAP, 39.95s
1953 Reg Hunt, Hunt Vincent, 39.70s
1954 Reg Hunt, Hunt Vincent, 39.70s
1955 Bill Patterson, Cooper JAP, 3.02s.
1956 Bill Patterson, Cooper JAP, 39.02s
1957 Bill Patterson, Cooper JAP, 40.02s
1958 Bruce Walton, Walton Special, 37.18s
1959 Bruce Walton, Walton Special, 38.18s
1960 Murray Trenberth, Vincent Special, 37.07s
1961 Bruce Walton, Walton Cooper, 36.86s
1962 Bruce Walton, Walton Cooper, 36.87s
1963 Bruce Walton Walton Cooper, 36.50s.

These stats show that air-cooled cars were championship winners for 11 straight years beginning in March 1952 when John Crouch recorded 39.95 seconds in a Mk5 Cooper JAP, until 1963, when Bruce Walton got down to (or up in) 36.50 seconds.

All these cars ultimately became what we now know as Lb Historic cars. Both Bruce Walton's famous cars are now owned and operated by *Loose Fillings* editor Terry Wright.

By way of interest, this year an ageing cherry-grower revisited Collingrove with an 1100 Mk5 and a 500 Mk6 Cooper to challenge those times. He failed dismally. The 500 struggled to do 42's, and only by putting the younger specialist Collingrove MG driver John Payne in the 1100 Mk5 was a very respectable 37.35s achieved.

Sadly, once the happy hunting ground for Coopers, Collingrove hillclimb entries are now dominated 95% by touring cars. So these days there are no more crackling exhausts. No more skinny little cars with fold up wheels disappearing over the skyline. No more blue burnt haze of Castrol R to make the true believers breathe in deep and smileand then nod knowingly.

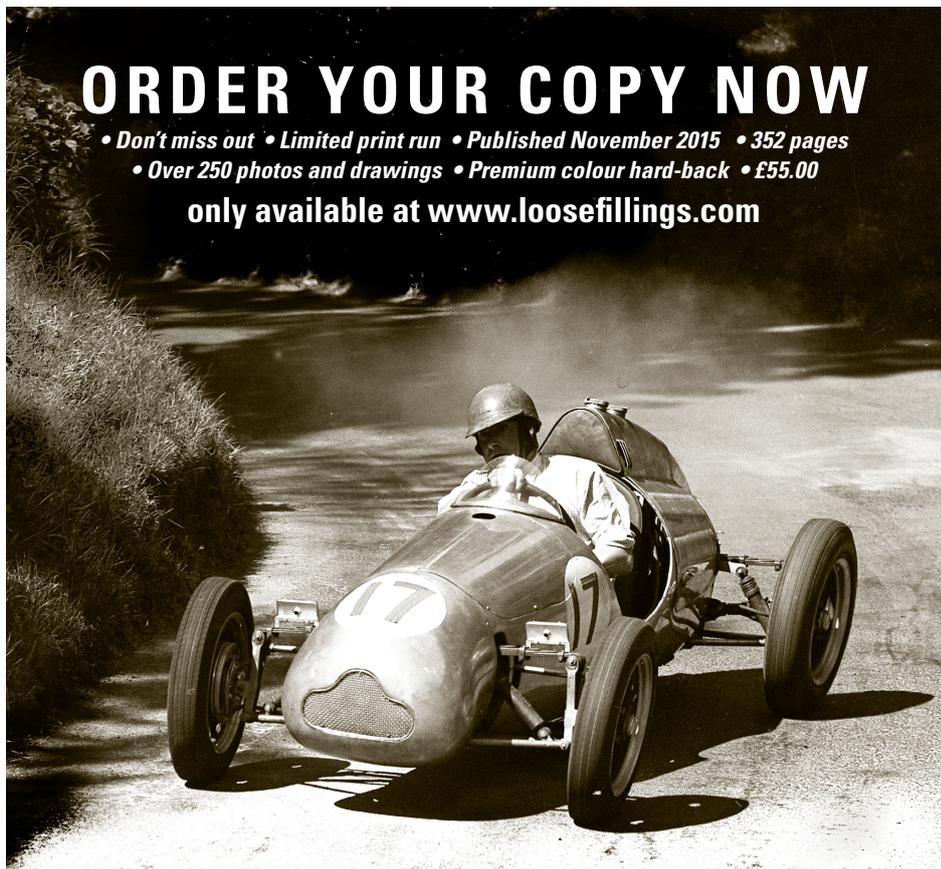
Which is sad really ... DG.

Right: John Payne, Collingrove MG expert gets the Greeneklee Mk5 JAP twin car off the line for a 37.35s run at Collingrove last year. The Editor managed 37.25s at the Australian titles in 2003. These modern times say a lot about how good Bruce Walton was on a much poorer surface 40 years earlier.

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POWER WITHOUT GLORY

Racing the Big-Twin Cooper by Terry Wright

Foreword by Mike Cooper

Power Without Glory is a new look at the early history of the modern racing car. It explores the influences behind the first Coopers, looking back through the history of world record motorcycles, hillclimb and sprint specials and dirt-track speedway cars. The Cooper's mating with the V-twin JAP, and how the engine and the chassis developed, are illustrated by never-before-published factory drawings and hundreds of photographs. The racing and hillclimbing of the early post-war years are covered in depth. Cooper cars played a major part in propelling Britain into a leading position in world motorsport. This is the story of how it all began.





IVAN TIGHE - RACER TO THE END

Ivan Tighe, a three-time winner of the Australian Hill Climb Championship, passed away recently. He was a racer to the end and CAMS' website paid him this tribute:

Ivan started his love affair with motor sport on two wheels and while he raced in many four-wheeled categories, he was a regular Formula 2 driver, having also raced Formula 5000 machines and competed in the Australian Grand Prix on more than one occasion.

He excelled in hill climbing. He was CAMS Australian Hill Climb Champion three times. The first of his three titles came in 1964 behind the wheel of a car of his own making... a Tighe Vincent.

Also winning the championship in 1985 and 1991, he made the remarkable feat of having claimed three titles in three different cars in the space of four decades.

Born in Melbourne on 22 September 1931, Ivan had the mind of an engineer and was involved with the Repco Research

team in the 1960s under the late Sir Jack Brabham. In 1966 he set up Ivan Tighe Engineering in Brisbane, a business that specialises in cam shafts and is still in operation. Ivan was 83 and a racer to the end... having competed in motor sport until just a few years ago.

Terry Wright adds: I got to know Ivan a little when I visited him to try and sort out some cams for the JAP I was building from scratch for the Walton Special. I had been to several well known camshaft companies overseas wanting something developed and they all said they could copy something but couldn't start from scratch.

I asked Ivan what to do and he said there was a bloke he used in Chicago who could work it all out by computer for a few thousand dollars. He said you could get nearly as good by working off something that worked already and modifying it to suit the new application and that's what he did for me.

I asked him how they did it at Repco and he said they plotted and adjusted a profile on the full height of the drawing office wall and worked off that.

He had a 'private' workshop above his main factory floor which seemed to be very quiet when I was there. I understood he had made and sold a lot of cam grinding machinery as well as doing this work himself. I wish I had known him more – but I do have the cams he made for me and they seem to work very well.

Top: Ivan in the Tighe Vincent and, left, working on the Editor's JAP cams.



FOR SALE

Kenner R64 500 in beautifully rebuilt, no-expense-spared, running condition. Price negotiable at market level.

Triumph 650, pre-unit twin, on-board electric starter, electronic auto-retard, electric fuel pump to weir-type fuel level, plumbed fire extinguisher, twin-cylinder adjustable bias braking, aluminium fuel, oil and catch tanks, two-pack paint, leather trimmed racing seat, ROPS and all detail that you would expect, together with an extra gearbox, head, cylinders, pistons and many other spares. Megaphones or alternative stainless steel mufflers to below 95dB.

CAMS log book and Group M COD. Documented history and pictures. Number 47 as at 1965. Includes a covered, two-wheel trailer, torsion bar independently suspended with dampers, hydraulically braked with tool-box, tie-down straps, winch and ramp tail-gate. Email info@peterburford.com.au .

WINTON LONG-TRACK

Derry Greeneklee reports from the Long Track Winton meeting on 12-14 August when the weather was cold for three days.

■ Race 1 Sat afternoon. Great consternation when race length announced at 10 laps of the long circuit. Mk6 tank 12 litres. Mk9 tank 16 litres! Sure enough the Mk6 ran out of fuel on lap 8 when in 5th. Brian just got to the finish and was placed 2nd.

■ Race 2 Sunday morning. Ten laps. I did not run the Mk6 because we knew we would run out of fuel. Brian had a brilliant race and won.

■ Race 3. Eight laps Hooray. Brian started on pole. Derry back of field. The situation was discussed by team management. The Mk9 would go hard for a couple of laps, then drop back and wait for the Mk6. Brian and Derry would then have a private race. The result was a 3rd and a 5th when Stumpy Russell invited himself to the party and got between us.

■ Conclusion? Coopers running together for the full distance, much to everyone's surprise and entertainment!

BITS & PIECES

■ Ian Garmey has sold his Mk5 Cooper to UK. This is the car that previously had the pulse jet engine in it.

■ Graeme Brayshaw had a really good run in his Cooper Mk8 Norton at the Vintage Car Club of NZ's Ron Roycroft Trophy meeting at Hampton Downs on Saturday and Sunday, 14 and 15 March.

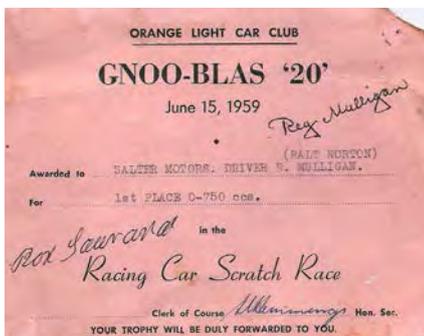
■ Karl Rolfe successfully demonstrated the

recently re-built Satellite Special Triumph at the same event for its first run on a track in probably 30 years.

- The Cooper Irving managed three runs at the VSCC Rob Roy meeting on 16 August, improving with each run, culminating in a 27.89s best time.

- The Walkhem Vincent has returned to Tasmania, less Vincent engine.

- The BB Ariel has been sold by Chris Tracey to a Canberra enthusiast.



FROM REG MULLIGAN

The recent *Loose Fillings* story on Ron Tauranac brought back some great memories which I will share with you. I consider myself to be one of the more fortunate drivers in Australian motorsport as I am the only person to have owned and raced the two magnificently locally built Ralts.

I acquired Ralt 1 early in 1959 from Bert Bartrop in exchange for a caravan. The only race-track operating in NSW for P-plate drivers was at Orange so I journeyed there on the long weekend in company with Merv Ward who was driving a Holden special. We camped on the infield in a tent, a cold and primitive arrangement unlike the comforts available to today's competitors.

I remember being very nervous on the dummy grid, revving the engine up and down, where-upon Jack Myers came over and stuck his shoe in the megaphone exhaust. I was a class winner and received a certificate which Ron signed many years later.

The next event I attended was a combined bike and car meeting in Queensland. A former work colleague, Bob Salter, was a bike shop owner and Australian sidecar champion who had a BP contract along with another team member Jack Ahearn, himself an Australian solo champion.

We loaded the sidecar, Jack's solo and the Ralt on one trailer and crew members Joe Hill, Bruce Richardson and myself drove the Jaguar overnight to a successful meeting. The next trip to Queensland resulted in piston failure. I later traded the car to Frank Match on the HMW. Ralt 1



Research by Bob Ross has helped identify the cars and drivers in this picture, which was taken at the opening meeting at Catalina Park, Katoomba NSW on 12 February 1961. The race was a four-lapper, with prize money of £1, £3 and £2 (£A of course) for the top three places. On pole is Reg Mulligan, Ralt 4, Vincent-engined with his friend Bob Maine and Vincent guru Alan Burdis waiting to push start. Alongside is Barry Garner in the Nota Major, currently raced in historics by Dick Willis, #46 is Alan Heasman, Scarab 650cc, #37 is D Russell, MGTC Special, #68 is Peter Wherrett in the Cooper Mk4-Minx, and # 31 is Toby Hindes, Ralt 498cc.

had won its last race.

I acquired the Ralt Vincent in late 1960 and drove it in the first racing car event (race 2 on the programme) at the opening meeting at Warwick Farm, NSW, on 18 December 1960.

My crew had moved to Leaton Motors but I was fortunate to have a speedway friend and championship winning sidecar owner Allan Burdus look after the engine. More tracks became available and this great-handling car enjoyed success

at these locations. I remember a class win on April 3rd, 1961 at Bathurst and wins at Katoomba.

I can say with confidence that I was a lucky owner-driver to have won in both Australian-built Ralts. Unfortunately the drivers after me wrecked the cars before my eyes. Graham Howard rang me in the late 1960s for my recollections for an upcoming book but unfortunately it didn't eventuate.

RM.

LOOSE FILLINGS in the FUTURE

The next, the Summer 50th issue of Loose Fillings, will be the last that appears in this paper and pdf format. Since it was started in 1999 it has reported the doings and history of air-cooled racing cars in Australia, New Zealand and occasionally elsewhere. All these pages, maybe 250 of them, are now available on line at www.loosefillings.com, as will new stories with space for discussion on any relevant topic. You can register there for an update when new material is posted so we hope we will see you there.

LOOSE FILLINGS

This and past issues can be found in pdf format at www.loosefillings.com

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